ROMANIAN CIVILIZATION
SUPPLEMENT
1
ONE HUNDRED ROMANIAN AUTHORS IN THEORETICAL COMPUTER SCIENCE

ROMANIAN CIVILIZATION

General Editor:
Victor SPINEI

SUPPLEMENT
1

THE ROMANIAN ACADEMY

THE INFORMATION SCIENCE AND TECHNOLOGY SECTION

ONE HUNDRED ROMANIAN AUTHORS IN THEORETICAL COMPUTER SCIENCE

Edited by:
SVETLANA COJOCARU
GHEORGHE PĂUN
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PREFACE

This book may look like a Who's Who in the Romanian Theoretical Computer Science (TCS), it is a considerable step towards such an ambitious goal, yet the title should warn us about several aspects.

From the very beginning we started working on the book having in mind to collect exactly 100 short CVs. This was an artificial decision with respect to the number of Romanian computer scientists, but natural having in view the circumstances the volume was born: it belongs to a series initiated by the Romanian Academy on the occasion of celebrating one century since the Great Romania was formed, at the end of the First World War. This series is simply monumental: over 30 large volumes, with the common title *The Romanian Civilization,* covering many scientific and cultural areas, from history and geography to mathematics, physics, and chemistry, from geology and medicine to literature and music – including computer science (all books in *The Romanian Civilization* series will be also translated in English).

The general volume dealing with computer science in *The Romanian Civilization* series appears under the coordination of Florin Gheorghe Filip, Member of the Romanian Academy. It contains a chapter called *From the History of Romanian Theoretical Computer Science,* written by one of the present editors (Gh. P.). It is a quick overview of the Romanian theoretical computer science, in less than three dozens of pages, starting from the "pre-history" of computer science, in general, not only Romanian, namely, with the 1927 paper by Gabriel Sudan, who produced, at the same time and independently of W. Ackermann, the first example of a recursive function which is not primitive recursive. (We say that this is "pre-history", because at that time computer science did not even exist, the terminology itself used before was coined after 1930.) Further, the chapter shortly describes the activity of the two forerunners-patriarchs of the Romanian computer science, Grigore C. Moisil and Solomon Marcus, both of them members of the Romanian Academy, and continues till our times, mentioning ideas, authors, groups, referring to both Romanians working in Romania and to Romanians all over the world, and also to living persons and to persons who passed away.

Therefore, the term "history" should be understood in this framework in a broad sense, concerning the evolution of the field from the origins until the present days.

The mentioned *From the History...* chapter has obvious limits in what concerns the provided information and actually this was the starting point of the present book. The chapter is informal, hence the need for more technical details occurred, at least at the bibliographical level. The present book provides such an information – including hints (e.g., personal web pages) on how and where more comprehensive details can be found.

However, this is done limiting to one hundred the number of presented scientists!... (One hundred, with the Centennial background, but also having in mind other limits such as the number of pages the volume might have or the time to complete the project – also knowing that a comprehensive-complete Who's Who of an encyclopedic-dictionary type is not very realistic for computer science, even restricting ourselves to the theoretical one.)

Thus, an obvious consequence follows: this volume does not suggest a hierarchy, an ordering of any type. Only 100 Romanian authors who have significantly contributed to the (theoretical) computer science, who (1) we were able to contact (hence we knew their email addresses), and (2) they answered positively our invitation to contribute to the volume. Precisely, we have proposed to all of them to send us, until a certain deadline, a short presentation structured along of the items most of the next presentations contain. The result is what follows.

Many computer scientists colleagues, both from Romania and from other countries, are regretfully missing from this book. A list of missing persons, clearly incomplete, contains both "classic" names (Academician Mircea Malița, Peter Hammer-Ivănescu, Samuel Abraham, Teodor Rus, Constantin Popovici) and rather young persons (many in Romania, many abroad; hundreds of successful doctorates in computer science were completed in the last decades, in universities from many places), including computer scientists with a well-established career (Grigore Roşu, Cătălin Dima, Răzvan Andonie, Cătălin Ioniță, Toader Jucan, Mihaela Malița, Mircea Sularia, Daniela Rus, Horia Georgescu, Virgil Emil Căzănescu, Florentina Hristea, and so on and so forth). Also, only a few computer scientists who passed away were presented (in most cases with the help of their disciples or colleagues of them present in the book), several others were omitted – among them: Andrei Baranga, Şerban Buzeţeanu, Dumitru (Dan) Dumitrescu, Emil Muntean, Nicolae Ţăndăreanu.

A second edition of the book, if any, will contain maybe most if not all of these names.

Another important point concerns the "definition" of the *set* of scientists to be present(ed) in the volume. This is definitely a *fuzzy set*, from two points of view: (1) what means *Romanian*, and (2) what means *theoretical*.

Because the book is dedicated to the Centenary of the Great Union, we interpreted the term "Romanian" in a rather comprehensive manner: *persons born in Romania or speaking Romanian language*, no matter which is their formal citizenship

or where they are living and working. In particular, this was applied to our colleagues from the Republic of Moldova – and this is valid also for the team of the three co-editors.

A much more difficult issue is that of what means theoretical computer science. The point was touched also in the beginning of the *From the History...* chapter. This is an endless discussion, about an undecidable (even false) problem. There is no borderline between theoretical and... what else, in the area of computer science? Hardware, software, applications? All of these areas involve "theory". Furthermore, which is the difference between theoretical computer science and mathematics (applied to computing)?

Of course, we have proceeded intuitively (to come back to the idea of fuzzy sets: also there the membership function is often defined *subjectively...*).

At this stage it would be interesting and instructive to remind some significant ideas of our forerunner Professors. In the preface written in March 1968 of his Pergamon Press book from 1969 (*The Algebraic Theory of Switching Circuits*), Gr. C. Moisil gives three examples concerning the usefulness of the "new mathematics", which ceases to be a quantitative science and begins to be a structural science: the mathematical linguistics, the pseudo-Boolean programming, and the theory of the programming languages, all of them pointing out to some priorities in the field of Theoretical Computer Science at the time. Moreover, he warns us not to forget that the first technical discipline based on this structural mathematics is the algebraic theory of switching circuits.

We would also like to cite the works of Solomon Marcus constantly emphasizing the pilot role of (formal) linguistics and mathematics, together with their cultural values, in other different bodies of knowledge such as economy, biology or physics. Accordingly, in his well-known *Reception Speech in the Romanian Academy*, he deals – perhaps for the first time in our context – with what should be understood by the common expression "mathematical language". One shows that this language becomes *even* the *existential mode* for the object of the knowledge, a most interesting point of view for a philosophy of knowledge viewed in a close solidarity with practical existence.

In short, this volume is only a first step on a long way, towards a comprehensive presentation of the Romanian computer scientists – but this is a volume providing a lot of information, both at a precise, bibliographical level, and at the global level, as a general view about the Romanian (theoretical) computer science. Many conclusions can be drawn starting from the data contained in this book. We only point out, very shortly, a few observations, a more detailed analysis remaining for another framework.

Both in *time* (from "old" times to present) and in *space* (looking at the map of Romania and at the map of the Earth as well), the Romanian computer science is

rather developed, diversified, synchronized and very well connected with the international computer science, both historically and geographically. Besides space and time, we can also add a third "dimension", an internal one, the *range of topics* addressed by Romanian computer scientists. Again, we can note the close links (we may call it "isomorphism") with the computer science in general: practically, all branches were explored, from logics to natural computing, from automata and language theory to algebraic approaches. A powerful science, indeed. The names of Romanian computer scientists can be found from top level bibliographies of theoretical contributions to managing positions in successful companies. The next pages are a proof, especially for the theoretical area. Another observation is related to the sociology of the domain: a large number of scientists presented in this book started their research activity, for master and doctoral studies, in the theoretical area, many of them in relation with faculties of mathematics and under the scientific guidance of mathematicians (open to computer science or even working in theoretical computer science), and then they devoted themselves mainly to teaching or to applications of computer science, in a wide range of domains.

A few words about the style of the volume could be here in order. We requested presentations with a precise format, but the contributions correspond to (hence reflect) a great variety of personalities and career experiences, not to mention ages and cultural environments. The selected information is entirely due to the contributors – e.g., the "main results", the "representative papers" and so on. We tried to unify the materials as much as possible, thus losing to a certain extent the personal flavor of some of the received texts. This suggests a possible continuation of this endeavour: to put together in a volume personal recollections of computer scientists with an interesting life or working experience, especially of those who witnessed the beginning of Romanian computer science or who have participated in significant developments, theoretical or of another nature. We would like to come back to such a project.

Of course, this volume was only possible due to the participation of the computer scientists present in it – we are indebted to all of them for the efficient and smooth cooperation. Several colleagues, some of them mentioned in the pages which follow, have contributed with texts, with comments, corrections – our thanks and indebtedness.

Thanks are also due to the staff of the Publishing House of the Romanian Academy – simply professional!

The Editors
March, 2018

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ALHAZOV, Artiom

Born on October 11, 1979, in Chişinău, Republic of Moldova.

Education: University degree in mathematics and computer science, 1996–2001, State University of Moldova (USM), Chişinău.

PhD in languages and information systems, Universitat "Rovira i Virgili", Tarragona, Spain, 2006. Thesis title: *Communication in Membrane Systems with Symbol Objects.* Scientific advisors: Iurie Rogojin and Rudolf Freund.

Dr. Habilitatus degree in computer science, Institute of Mathematics and Computer Science, Academy of Sciences of Moldova, Chişinău, 2013. Habilitation thesis: *Small Abstract Computers.* Scientific advisor: Iurie Rogojin.

Scholarships, postdoc stages:

Computational Biomodelling Laboratory, Åbo Akademi University, Turku, Finland, 2007; Foundation of Computer Science Lab, Hiroshima University, Higashi-Hiroshima, Japan, 2008–2010; Bimib Research Group, Milano-Bicocca University, Milan, Italy, 2011–2012.

Positions:

Software engineer, junior researcher, researcher, leading researcher, principal researcher, Institute of Mathematics and Computer Science, Chişinău, Moldova, 2005–present.

Visiting researcher, 2016, 2017, Huazhong University of Science and Technology, Wuhan, China.

Research areas: Formal language theory, natural computing. Parallel distributed multiset/string processing (membrane computing), promoters, inhibitors, catalysts, antimatter, determinism, confluence, reversibility, weak forms of interaction, computational completeness, descriptional complexity of universal systems.

Main results:

Small universal systems, e.g., a universal P system with 23 antiport rules.

Study of determinism and reversibility and their strong variants for maximally parallel and sequential multiset rewriting.

Membrane creation and dissolution yields computationally complete non-cooperative P systems.

P systems with active membranes without polarizations are computationally complete.

PSPACE – complete problems can be solved by P systems with active membranes without polarizations.

Networks of evolutionary processors are computationally complete with 2 nodes, and the hybrid ones are computationally complete with 5 nodes.

Controlled non-cooperative P systems are computationally complete, while the deterministic ones have subregular characterizations.

Energy-based P systems are computationally complete.

P systems with insertion-deletion of one symbol without context are computationally complete with priority of deletion over insertion.

Introducing and studying membrane separation in P systems.

Computational completeness and efficiency of P systems with 2 polarizations.

Many results on symport/antiport of small size or over small alphabets.

Computational completeness of non-cooperative P systems with antimatter, and small universal systems.

Small unversal register machines and catalytic P systems.

Synchronization in P systems.

Polymorphic P systems.

Linguistic applications of P systems: dictionary, inflections, and annotating affixes.

Membership to professional organizations: International Membrane Computer Society.

Honors, prizes, scientific distinctions:

Best Paper Award at Asian Conference on Membrane Computing, Chengdu, China, 2017.

Prize of the Academy of Sciences of Moldova in Mathematic and Economic Sciences, Supreme Council on Science and Technological Development, for a collection of papers "Biological Computing Models: Universality, Complexity, and Properties". Chişinău, Moldova, 2010.

National Youth Prize in Science, Technology, Literature and Arts, edition 2006, for a collection of papers "Biocomputing: From Living Cells to Computers and Vice-Versa", Chişinău, Moldova, 2006.

Representative articles:

1. (with C. Martín-Vide, L. Pan) Solving a **PSPACE**-Complete Problem by P Systems with Restricted Active Membranes, *Fundamenta Informaticae*, 58, 2 (2003), 67–77.

2. (with L. Pan) Solving HPP and SAT by P Systems with Active Membranes and Separation Rules, *Acta Informatica*, 43, 2 (2006), 131–145.

3. (with L. Pan, Gh. Păun) Trading Polarizations for Labels in P Systems with Active Membranes, *Acta Informatica*, 41, 2–3 (2004), 111–144.

4. (with M.J. Pérez-Jiménez) Uniform Solution of QSAT Using Polarizationless Active Membranes, *Proc. Machines, Computations, and Universality, 5th International Conference*, MCU 2007, Orléans, *LNCS* 4664, Springer, 2007, 122–133.

5. (with R. Freund, Yu. Rogozhin) Computational Power of Symport/Antiport: History, Advances and Open Problems, *Proc. Membrane Computing, 6th International Workshop, WMC 2005, Vienna, Revised Selected and Invited Papers, LNCS* 3850, Springer, 2006, 1–30.

6. (with R. Freund, M. Oswald) Tissue P Systems with Antiport Rules and Small Numbers of Symbols and Cells, *Proc. Developments in Language Theory: 9th International Conference, DLT* 2005, Palermo, *LNCS* 3572, Springer, 2005, 100–111.

7. (with T.-O. Ishdorj) Membrane Operations in P Systems with Active Membranes, *RGNC Report 01/2004, University of Seville, Second Brainstorming Week on Membrane Computing*, Sevilla, 2004, 37–44.

8. (with L. Pan, T.-O. Ishdorj) Further Remarks on P Systems with Active Membranes, Separation, Merging, and Release Rules, *Soft Computing – A Fusion of Foundations, Methodologies and Applications,* 9, 9 (2005), 686–690.

9. (with J. Dassow, C. Martín-Vide, Yu. Rogozhin, B. Truthe) On Networks of Evolutionary Processors with Nodes of Two Types, *Fundamenta Informaticae*, 91, 1 (2009), 1–15.

10. (with R. Freund, M. Oswald, M. Slavkovik) Extended Spiking Neural P Systems, *Proc. Membrane Computing, 7th International Workshop, WMC 2006, Leiden, Revised Selected and Invited Papers, LNCS* 4361, Springer, 2006, 123–134.

Personal web pages: http://aartiom.50webs.com, http://www.math. md/ en/ people/alhazov–artiom/

AMAN, Bogdan

Born on June 26, 1982, in Dorohoi, Botoşani, Romania.

Education:

University studies in mathematics and computer science, Faculty of Mathematics, "Al.I. Cuza" University, Iaşi, Romania (2001–2005).

Master in mathematics-computer science, Faculty of Mathematics, "Al.I. Cuza" University, Iaşi, Romania (2005–2007).

PhD: Romanian Academy, Iaşi Branch, Institute of Computer Science, 2009. Thesis title: *Spatial Dynamic Structures and Mobility in Computation.* Scientific advisor: Gabriel Ciobanu.

Scholarships, postdoc stages:

Research scholarship at Turin University (Italy), 15 February–15 May 2008.

Postdoc stage at Faculty of Mathematics, "Al.I. Cuza" University, Iaşi, Romania, July 2010–March 2013.

Positions:

Scientific Researcher in Several National Research Projects at Romanian Academy, Iaşi Branch, Institute of Computer Science (2005–2010).

Scientific researcher in Several National Research Projects at "Al.I. Cuza" University, Iaşi, Romania (2010–2013).

Scientific researcher at Romanian Academy, Iaşi Branch, Institute of Computer Science (2013–present).

Research areas: Wide-ranging interests in computing, including: (i) theory of programming: semantics, formal methods, logics; (ii) distributed systems and concurrency: process algebra, mobile agents, model checking; (iii) computational models inspired by biology: membrane computing, brane calculi.

Honors, prizes, scientific distinctions: "Grigore C. Moisil" Prize of Romanian Academy, 2011.

Books:

1. (with G. Ciobanu) *Mobility in Process Calculi and Natural Computing,* Natural Computing Series, Springer, Berlin, 2011.

2. (with J. Kleijn, M. Koutny, D. Lucanu, eds.) *Methods for Distributed and Concurrent Systems: Special Issue on the Occasion of the 60th Birthday of Professor Gabriel Ciobanu, Fundamenta Informaticae,* 153, 1–2 (2017).

Book chapters:

1. (with G. Ciobanu) Mobile Membranes and Mobile Ambients, *The Oxford Handbook of Membrane Computing,* Oxford University Press, Gh. Păun, G. Rozenberg, A. Salomaa, eds., 2010.

2. (with G. Ciobanu) A Temporal Logic for Mutual Mobile Membranes with Objects on Surface, *Computation, Cooperation, and Life – Essays Dedicated to Gheorghe Păun on the Occasion of His 60th Birthday*, Springer, Berlin, 2011.

Representative articles:

1. (with P. Battyányi, G. Ciobanu, G. Vaszil) Simulating P Systems with Membrane Dissolution in a Chemical Calculus, *Natural Computing*, 15, 4 (2016), 521–532.

2. (with R. Horne, A. Tiu, G. Ciobanu) Private Names in Non-Commutative Logic, *CONCUR* 2016, 31:1–31:16.

3. (with A. Alhazov, R. Freund, S. Ivanov) Simulating R Systems by P Systems, *Int. Conf. on Membrane Computing*, 2016, 51–66.

4. (with A. Alhazov, R. Freund, Gh. Păun) Matter and Anti-Matter in Membrane Systems, *DCFS,* 2014, 65–76.

5. (with E. Csuhaj-Varjú, R. Freund) Red-Green P Automata, *Int. Conf. on Membrane Computing*, 2014, 139–157.

6. (with G. Ciobanu, S.N. Krishna) Solving the 4QBF Problem in Polynomial Time by Using the Biological-Inspired Mobility, *ICDCIT*, 2013, 432–443.

7. (with G. Ciobanu, M. Koutny) Behavioural Equivalences over Migrating Processes with Timers, *FMOODS/FORTE*, 2012, 52–66.

8. (with G. Ciobanu, G.M. Pinna) Timed Catalytic Petri Nets, *SYNASC,* 2012, 319–326.

9. (with M. Dezani-Ciancaglini, A. Troina) Type Disciplines for Analysing Biologically Relevant Properties, *Electr. Notes Theor. Comput. Sci.*, 227 (2009), 97–111.

10. (with G. Ciobanu) On the Relationship Between Membranes and Ambients, *BioSystems*, 91, 3 (2008), 515–530.

Further information:

Steering Committee: International Conference on Membrane Computing (starting from 2016).

Conferences Committee: International Membrane Computing Society (http: //membranecomputing.net/IMCSBulletin/index.php?page= imcs_structure).

Personal web page: http://iit.iit.tuiasi.ro/~baman/

ANDREI, Neculai

Born on September 23, 1948, in Bacău, Romania.

Education: "Al.I. Cuza" University Iaşi, Faculty of Mathematics, (1966–1969); University Politehnica of Bucharest, Automation and Computer Sciences Faculty (1969–1973).

PhD: "Politehnica" University of Bucharest, Automation and Computer Sciences Faculty, 1980–1984. Thesis title: *Contributions to Large-Scale Systems Control*. Scientific advisor: Sergiu Călin.

Scholarships, postdoc stages:
Alexander von Humboldt Stiftung, Germany, Duisburg-Essen University, Department of Mathematics, and Bayreuth University, Department of Mathematics (1990–1997).
Georgia Institute of Technology Department of Mathematics, August 2000.
CERFACS: Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique, Toulouse, France, Parallel algorithms Laboratory (September 2001 and February 2009).
Visiting researcher: Berlin Mathematische School; Duisburg-Essen University; Instituto di Analisi dei Sistemi ed Informatica "A Ruberti", Roma; Aristotle University, Thessaloniki; Technical University of Istanbul, etc.

Positions:
Scientific researcher, Research Institute for Informatics (1973–2018).
Senior scientific researcher, Research Institute for Informatics (1995–2018).
Deputy director, Research Institute for Informatics (2008–2016).

Research areas: High performance computing, sparse matrix computation technology, large-scale linear-dynamic systems, mathematical modeling and algebraic oriented languages and compilers for mathematical programming, large-scale linear and nonlinear optimization.

Main results:
Introduced in Romania the "sparse matrix computing technology", as a component of the high performance computing (see the book N. Andrei, C. Răsturnoiu, *Matrice rare şi aplicaţiile lor*, Technical Press, Bucharest, 1983, 1–280).

Introduced a new theory of the large-scale linear dynamic systems, using the structural approach in which I solved the fundamental problems of the linear dynamic systems at the structural level (see the first book published in the world on this subject matter: N. Andrei, *Sparse Systems – Digraph Approach of Large-Scale Linear Systems Theory*, Verlag TUV Rheinland GmbH, Köln, Germany, 1985).

For solving large-scale linear programming problems (thausand of constraints) I elaborated and implemented simplex algorithms ASLO with product form of inverse which, minimize the number of new created nonzeros in inverse and maintain the numerical stability. I extended all these algorithms for solving the large-scale discrete optimal control problem (see the book: N. Andrei, *Critica Raţiunii Algoritmilor de Programare Liniară*, Editura Academiei Române, Bucureşti, 2011, 908 pages). For large-scale linear optimization problems I defined and consolidated the imbedding principle – a decomposition mechanism.

In Romania, for the first time, I introduced "the high level algebraic oriented modeling languages for linear optimization", by defining a language as a dialect of the natural language and the associated compiler (see Algebraic Modeling Languages, http://www.mat.univie.ac.at/~oleg/AML.html).

I implemented the industrial system: "SAMO – System for Advanced Modeling and Optimization" using the algebraic language ALLO and the solver ASLO.

For solving large-scale nonlinear optimization problems I introduced a multitude of concepts based on adaptativity, acceleration, scaling, convex combinations, eigenvalues shifting, gradient flow optimization, etc.

Administrative positions:
Chief of Laboratory: Mathematical Modeling (2000–2008).
Deputy director, Research Institute for Informatics (2008–2016).

Editorial boards: *Computational Optimization and Applications* (Springer + Business Media, from 1992), *Numerical Algorithms* (Springer + Business Media, from 2016), *Studies in Informatics and Control* (Bucharest, Romania, from 1998), *Annals of Academy of Romanian Scientists – Science and Technology of Information* (AOSR Press, Bucharest, from 2008), *Revista Română de Informatică şi Automatică* (ICI Publishing House, Bucharest; editor-in-chief, 2009–2016), *Annals of Pure and Applied Mathematics* (from 2010), *Advanced Modeling and Optimization* (electronic journal, editor-in-chief, from 1999) – and others.

Membership to professional organizations: ERCIM – European Research Consortium for Informatics and Mathematics (Working Group Applications of Numerical Mathematics in Science); Society for Industrial and Applied Mathematics (USA, Optimization Section); MCDM – Multiple Criteria Decision Making (USA); IFAC (International Federation of Automatic Control) Technical Area 2 (Design

Methods); EUROPT – the Continuous Optimization Working Group of EURO; The Working Group on Generalized Convexity; Center for Advanced Modeling and Optimization – and others.

Honors, prizes, scientific distinctions:

"Grigore C. Moisil" Prize of the Romanian Academy, 2001.

The best book in Informatics Award, of Romanian Editors Association, for the monograph N. Andrei, *Modele, Probleme de Test şi Aplicaţii de Programare Matematică*, Editura Tehnică, Bucharest, 2003.

"Ştefan Odobleja" Award of the Academy of Romanian Scientists, 2014.

Full member of the Academy of Romanian Scientists, from 2008.

Ph.D students: Dragoş Nicolau (2016–present).

Books (over 20 books in mathematical modeling and optimization area):

1. *Sparse Systems, Digraph Approach of Large-Scale Linear Systems Theory*, Verlag TÜV Rheinland GmbH, Cologne, 1985 (viii + 255 pages).

2. *Nonlinear Optimization Applications using the GAMS Technology*, Springer Science + Business Media New York, Springer Optimization and its Applications Series, vol. 81, 2013 (xxii + 340 pages).

3. *Continuous Nonlinear Optimization for Engineering Applications in GAMS Technology*, Springer Science+Business Media New York, 2017, Springer Optimization and Its Applications, vol. 121, 2017 (xxiv + 506 pages).

4. *Critica raţiunii algoritmilor de optimizare fără restricţii*, Publishing House of the Romanian Academy, Bucharest, 2009 (xxviii + 826 pages).

5. *Critica raţiunii algoritmilor de optimizare cu restricţii*, Publishing House of the Romanian Academy, Bucharest, 2015 (xxviii + 1124 pages).

Representative articles (over 80 scientific papers in ISI journals):

1. Scaled Conjugate Gradient Algorithms for Unconstrained Optimization, *Computational Optimization and Applications*, 38 (2007), 401–416.

2. Acceleration of Conjugate Gradient Algorithms for Unconstrained Optimization, *Applied Mathematics and Computation*, 213 (2009), 361–369.

3. Accelerated Conjugate Gradient Algorithm with Finite Difference Hessian/ Vector Product Approximation for Unconstrained Optimization, *Journal of Computational and Applied Mathematics*, 230 (2009), 570–582.

4. Accelerated Scaled Memoryless BFGS Preconditioned Conjugate Gradient Algorithm for Unconstrained Optimization, *European Journal of Operational Research*, 204 (2010), 410–420.

5. On Three-Term Conjugate Gradient Algorithms for Unconstrained Optimization, *Applied Mathematics and Computation*, 219 (2013), 6316–6327.

6. An Accelerated Subspace Minimization Three-Term Conjugate Gradient Algorithm for Unconstrained Optimization, *Numerical Algorithms*, 65 (2014), 859–874.

7. A New Three-Term Conjugate Gradient Algorithm for Unconstrained Optimization, *Numerical Algorithms*, 68 (2015), 305–321.

8. An Adaptive Conjugate Gradient Algorithm for Large-Scale Unconstrained Optimization, *Journal of Computational and Applied Mathematics*, 292 (2016), 83–91.

9. Eigenvalues Versus Singular Values Study in Conjugate Gradient Algorithms for Large-Scale Unconstrained Optimization, *Optimization Methods and Software*, 32 (2017), 534–551.

10. A Double Parameter Scaled BFGS Method for Unconstrained Optimization, *Journal of Computational and Applied Mathematics*, 332 (2018), 26–44.

Further Information:

Author of over 60 highly professional Fortran packages for linear and nonlinear optimization, and of over 90 prototypes of linear and nonlinear optimization models expressed in ALLO or GAMS languages from different activity domains.

I elaborated the *Symmetry Conception* for Rational Interpretation of Divinity, as an extension of the Continuous Creation Conception of Divinity by Descartes.

Personal web page: https://camo.ici.ro/neculai/nandrei.htm

ATANASIU, Adrian Constantin B.

Born on December 21, 1946, in Târgovişte, România.

Education: Faculty of Mathematics, Bucharest University (1965–1970).

PhD: Bucharest University, 1978. Thesis title: *C-Grammars and Tree Codifications*. Scientific advisor: Silviu Guiaşu.

Positions:

Assistant Professor (1970–1980), lecturer (1980–1991), Associate Professor (1991–2001), Professor (2001–2011), at the Computer Science Department, Faculty of Mathematics, Bucharest University.

Professor at the Faculty of Electrical Engineering, "Valachia" Târgovişte University (2000–2001).

Fellowships, research stages: Hamburg University, Germany (Dec. 1992), Turku University, Finland (June 1994), Tarragona University, Spain (May–Oct. 2000, Jan.–March 2001).

Visiting Professor: University of Texas, Dallas (Sept.–Dec. 2002); Paris 12 Créteil (June 2004, 2005, 2006); Åbo Academy, Turku (May 2005, June 2006, 2007).

Research areas:

I had published around 85 scientific papers and 18 books and book chapters.

The research is focused on three main directions:

1. Formal languages and applications in compiler construction, natural language processing, and combinatorics on words. Research subdomains: (a) Study of context-sensitive and context-free grammars, applied to compiler construction. (b) Recognition tools. Several types of automata were defined: repetitive, queue memory, push-down list of states, translation devices. (c) Studies of generative tools. A much cited paper is the one defining modular grammars, a basic idea developed in grammars systems. (d) Algebraic mechanisms used in formal languages. Specifically: a learning model through examples, applied to the validation of programming languages; topological closures of languages using a certain distance; defining of valuation on word sequences, applied to synonymy. (e) Natural language results. (f) Parikh matrix mapping, an extension of Parikh mapping. Many results (about 15 papers) are directed to combinatorics on words and concern the injectivity of Parikh matrix mapping.

2. Cryptography and error correcting codes. The research can be divided in 3 subfields: (a) Coding theory. The results are mainly contained in the PhD thesis and they are very similar with convolutional codes using grammars. (b) Encryption systems, defined using gsms, provide another solution for the seller-of-secrets problem. Also, using the left derivation and syntactic parsers, one can define a public key encryption system; this system was extended to context-free grammars. (c) Formal encryption systems; they are generative encryption tools based on the substitution of words in a text with other words. (d) Works related to security tools: electronic signatures, e-passports, secret-sharing systems (about 5 scientific and conference papers).

3. Biological models. Researches are mainly focused on: (a) DNA computing operations: splicing and crossovering, (b) molecular computing, (c) artificial life; (d) P systems.

Main results:

1. Together with Al. Mateescu I have introduced (under the name of "ami-ability") the study of the injectivity for Parikh matrix mapping. This research is now – under the name of M-equivalence – the main topic of study for this concept. We have solved the problem for the binary alphabet and we have defined the main operations and notation necessary for the case of the ternary alphabet (solving this problem for the ME-equivalence case). We extended the study of Parikh matrix mappings to the morphisms (including Istrail morphism), s-shufle operators, rational extension, etc. Currently we continue this research with Parikh matrix mappings for powers of words.

2. I have defined – together with V. Mitrana – the concept of modular grammar, the first article which introduces the idea of grammar systems.

3. I have defined (in the PhD thesis) a new type of tree encoder (convolutional code) the first idea concerning Tanner graphs.

4. I built an ECDSA signature protocol using bilinear pairings.

5. Together with M. Andraşiu, Gh. Păun and A. Salomaa we have defined an encryption system based on applications of formal languages. We also initiated a study of formal encryption systems based on rewriting.

6. In the field of membrane computation I defined the main arithmetic operations and then the recursive computation in membranes, notions that we extended to a simulation of arithmetics on P systems.

Administrative positions: Vice-dean of the Faculty of Mathematics of University of Bucharest (1992–1996).

Editorial boards: *Journal of Computer Science Technology Updates* (editor-in-chief; 2011–2016), *Gazeta de Informatică* (editor-in-chief; 1991–1994), *Revista de Logică online* (editor-in-chief; 2007–2012).

Membership to professional organizations: AMS, IEEE, Scientific Committee EUROLOGO.

Honors, prizes, scientific distinctions: "Grigore C. Moisil" Prize of the Romanian Academy (2010), Professor Emeritus (2012).

PhD students: Luciana Morogan (2007–2011), Adela Mihăiță (2009–2011), Laura Savu (2009–2011), Ruxandra Olimid (2010–2012), Marius Mihăilescu (2010–2012), Ahmad Alomani (2009–2012), Qassim Almahmoud (2009–2012).

Books:

1. *Bazele matematice în scrierea compilatoarelor*, Ed. Olimp, Bucureşti, 1997.
2. *Teoria codurilor corectoare de erori*, Ed. Universității Bucureşti, 2001.
3. *Arhitectura calculatorului*, Ed. Infodata, Cluj-Napoca, 2006.
4. *Securitatea informației*, vol. I – *Criptografie*, vol. II – *Protocoale de securitate*, Ed. Infodata, Cluj-Napoca, 2007, 2009.
5. *Secret Sharing Schemes*, a chapter in *Informatics Security Handbook* (I. Ivan, C. Toma, eds.), Editura ASE, Bucureşti, 2007.

Representative articles:

1. C-Grammars and Tree-Codifications, *Journal of Computer and System Sciences*, 15, 1 (1977), 111–120.
2. (with V. Mitrana) The Modular Grammars, *Intern. J. of Comp. Math.*, 30 (1989), 17–35.
3. A Class of Coders Based on GSMs, *Acta Informatica*, 29 (1992), 779–791.
4. (with M. Andraşiu, Gh. Păun, A. Salomaa) A New Cryptosystem Based on Formal Language Theory, *Bull. Math. de la Soc. Sci. de Roumanie*, 36 (84), 1 (1992), 3–16.
5. (with C. Martín-Vide) Recursive Calculus with Membranes, *Fundamenta Informaticae*, 49 (2001), 1–15.
6. (with C. Martín-Vide, Al. Mateescu) On the Injectivity of Parikh Matrix Mapping, *Fundamenta Informaticae*, 49 (2001), 166–180.
7. Binary Amiable Words, *Intern. J. of Foundations of Computer Science*, 18, 2 (2007), 387– 400.
8. A New Batch Verifying Scheme for Identifying Illegal Signatures, *Intern. J. of Computing and Technology*, 28, 1 (2013), 144–151.
9. Parikh Matrix Mapping and Amiability Over a Ternary Alphabet, *Discrete Mathematics and Computer Science*, 2014, 1–12.
10. (with W.C. Teh) Irreducible Reaction Systems and Reaction System Rank, *Theoret. Comput. Sci*., 666, (2017), 12–20.

Further information: Chief coordinator of Informatics Committee of the Ministry of Education (1995–1998); President of the National Olympiad in Informatics

(1995–1997, 2003, 2004). Teamleader of the Olympic Team at International Scholarship Informatic Contests: IOI, BOI, CEOI (1995–1997). Expert evaluator of CNCSIS (2004–2008) and ARACIS (2007–2013).

For details about my papers and books see ResearchGate: https://www.researchgate.net/ profile/Adrian_Atanasiu

BALCAN, Maria-Florina

Born in Motru, Gorj county, Romania.

Education:
1996–2000: BSc, University of Bucharest, Romania. Faculty of Mathematics, Computer Science Department.
2000–2002: Master, University of Bucharest, Romania, Faculty of Mathematics, Computer Science Department, M.S. Degree in Computer Science.

PhD: Carnegie Mellon University, Pittsburgh, PA., Computer Science Department, 2008. Thesis title: *New Theoretical Frameworks for Machine Learning.* Scientific advisor: Avrim Blum.

Scholarships, postdoc stages:
2008–2009: Postdoctoral researcher, Microsoft Research NE, Cambridge, MA.

Positions:
June 2014–present: Associate Professor, School of Computer Science, Carnegie Mellon University, Pittsburgh, PA.
2009–2014: Assistant Professor, College of Computing, Georgia Tech, Atlanta, GA.

Research areas: Learning theory, machine learning, theory of computing, artificial intelligence, algorithmic economics and algorithmic game theory, optimization.

Editorial boards: *IEEE Transactions on Pattern Analysis and Machine Intelligence* (Associate editor, 2017–present); *Communications of the ACM* (Research Highlights section, 2015–present); *Machine Learning Journal* (action editor, 2015–2017); *Encyclopedia of Algorithms* (editor 2014–2015); *SIAM Journal on Computing* (special Issue for FOCS 2009); *Journal of Computer and System Sciences* (2011–2013).

Honors, prizes, scientific distinctions:
2014, Sloan Research Fellowship.
2012, Runner Up Best Paper, 25th Annual Conference on Learning Theory (COLT 2012).

2011, Microsoft Faculty Fellowship.

2009, NSF CAREER Award.

2009, Carnegie Mellon University, School of Computer Science, Distinguished Dissertation Award.

2008, Mark Fulk Best Student Paper Award, 21st Annual Conference on Learning Theory (COLT 2008).

2007–2008, IBM PhD Fellowship.

PhD students: Steven Ehrlich (2010–2016; co-advised with Jeff Shamma), Chris Berlind (2011–2015), Yingyu Liang (2010–2014).

Books:

1. (with P. Awasthi) *Center Based Clustering: A Foundational Perspective, a book chapter in Handbook of Cluster Analysis*, C. Hennig, M. Meila, F. Murtagh, R. Rocci, eds., Chapman and Hall/CRC, 2015.

2. (with A. Blum) *An Augmented PAC Model for Semi-Supervised Learning, a book chapter in Semi-Supervised Learning,* O. Chapelle, A. Zien, B. Schölkopf, eds., MIT Press, 2006.

3. (with F. Hristea) *Search and Knowledge Representation in Artificial Intelligence. Theory and Applications*, University of Bucharest Publishing House, 2005 (in Romanian).

Representative articles:

1. (with P. Awasthi, K. Voevodski) Local Algorithms for Interactive Clustering, *Journal of Machine Learning Research*, 18, 3 (2017), 1−35.

2. (with P. Awasthi, P. Long) The Power of Localization for Learning Linear Separators with Noise, *Journal of the ACM*, 63, 6 (2017).

3. (with Y. Liang) Clustering under Perturbation Resilience, *SIAM Journal of Computing*, 45, 1 (2016), 102–155.

4. (with V. Feldman) Statistical Active Learning Algorithms for Noise Tolerance and Differential Privacy, *Algorithmica*, 72, 1 (2015), 282−315.

5. (with S. Krehbiel, G. Piliouras, J. Shin) Near-Optimality in Covering Games by Exposing Global Information, *ACM Transactions on Economics and Computation*, 2, 4 (2014), 13:1–13:22.

6. (with A. Blum, A. Gupta) Clustering under Approximation Stability, *Journal of the ACM*, 60, 2 (2013), 8:1–8:34.

7. (with A. Blum, Y. Mansour) Surpassing the Price of Anarchy: Leading Dynamics to Good Behavior, *SIAM Journal on Computing*, 42, 1 (2013), 231−264.

8. (with K. Voevodski, H. Röglin, S.-H. Teng, Y. Xia) Active Clustering of Biological Sequences, *Journal of Machine Learning Research*, 13 (2012), 203−225.

9. (with S. Hanneke, J. Wortman) The True Sample Complexity of Active Learning, *Machine Learning Journal*, 80, 2−3 (2010), 111−139.

10. (with A. Blum) A Discriminative Framework for Semi-Supervised Learning, *Journal of the ACM*, 57, 3 (2010).

Further information:

Program Chair for the 33rd International Conference on Machine Learning (ICML) 2016; Program Chair for the 27th Annual Conference on Learning Theory (COLT) 2014; Board Member of the International Machine Learning Society, 2011–2015.

Top Level Program Committee Member: Annual Conference on Learning Theory (COLT) 2018; The 32nd Conference on Artificial Intelligence (AAAI) 2018; Senior Area Chair for Neural Information Processing Systems (NIPS) 2017; The 49th ACM Symposium on Theory of Computing (STOC) 2017; The 18th ACM Conference on Economics and Computation (EC) 2017; Thirtieth AAAI Conference on Artificial Intelligence (AAAI) 2016; ACM–SIAM Symposium on Discrete Algorithms (SODA) 2016; Area Chair for Neural Information Processing Systems (NIPS) 2015; Area Chair for International Conference on Machine Learning (ICML) 2015; The 18th International Conference on Artificial Intelligence and Statistics (AISTATS) 2015; Area Chair for the Conference on Uncertainty in Artificial Intelligence (UAI) 2015; Area Chair for International Conference on Machine Learning (ICML) 2013; The Annual Symposium on Foundations of Computer Science (FOCS) 2013; Annual Conference on Learning Theory (COLT) 2013; Area Chair for the Conference on Uncertainty in Artificial Intelligence (UAI) 2012; Workshop on Internet & Network Economics (WINE) 2012; Annual Conference on Learning Theory (COLT) 2012; Innovations in Computer Science (ICS) 2011; Area Chair for Neural Information Processing Systems (NIPS) 2011; Annual Conference on Learning Theory (COLT) 2011; Area Chair for Neural Information Processing Systems (NIPS) 2010; The 21st International Conference on Algorithmic Learning Theory (ALT) 2010; The Annual Symposium on Foundations of Computer Science (FOCS) 2009; Annual Conference on Learning Theory (COLT) 2009.

Personal web page: http://www.cs.cmu.edu/~ninamf/

BĂLĂNESCU, Tudor

Born on December 18, 1947, in Potcoava, Olt county, Romania.

Education: Computer science, Faculty of Mathematics and Mechanics, University of Bucharest (1966–1971).

PhD in mathematical linguistics, University of Bucharest, 1986. Thesis title *Programming Languages Design and Transduction Techniques*. Scientific advisor: Solomon Marcus.

Positions:

Programmer analyst in the Computing Center, University of Bucharest (1971–1991).

Lecturer (1991–1998) in the Department of Computer Science, Faculty of Mathematics and Computer Science, University of Bucharest.

Professor at the University of Piteşti, 1998–2013.

Research areas: A broad range of interests, from theoretical computer science to software development: formal languages and automata theory (papers no. 4, 5, 6 from Representative articles); formal specification, verification and testing of software systems (2, 7, 9 and book no. 2); formal semantics of programming languages and compiling techniques (2, 3); membrane computing (10, 8); programming languages and methodolgies (book no. 1). semiotics of folklore (1).

Main results:

A new design test conditions (weak output distinguishable, strong test- complete and output delimited type) for the generalized stream X-machines.

Axiomatic semantics for D.L. Parnas' nondeterministic iterative control structure; extension to nondeterministic behavior of Isomichi and Takaoka iterative instruction.

Development of a high level system programming languages (PLUB – Programming Language of the University of Bucharest) and implementation of its compiler; improvement of the Hartmann's error recovery scheme (in a team including Şerban Gavrilă, Marian Gheorghe, Radu Nicolescu, Liviu Sofonea).

Development of new variants of Lindenmayer systems (with M. Gheorghe, Gheorghe Păun);

Application of regulated rewriting control on branching grammars and fully initial grammars; contextual transductions (with M. Gheorghe, Gh. Păun).

Modeling the P systems with replicated rewriting by X-machines and application of the X-machine testing procedures for P systems (with Joaquin Aguado, Tony Cowling, M. Gheorghe, Mike Holcombe, Florentin Ipate).

Extension of FSM-based conformance testing methods (with F. Ipate).

Introducing the concept of X-machine with underlying distributed grammars (Xmdg, for short), acting as a translator by coupling the control structure of a stream X-machine with a set of formal grammars (with Horia Georgescu, M. Gheorghe, M. Holcombe).

Added ability for X-machines to exchange information, achieved by using communicating X–machines (with George Eleftherakis, H. Georgescu, M. Gheorghe, Petros Kefalas, Cristina Vertan).

Investigation of P systems in the asynchronous environments (with R. Nicolescu, Huiling Wu).

Administrative positions:

Chair of the Computer Science Department, University of Piteşti (2004–2013).

Director of the Computer Science Doctoral School, University of Piteşti (2016–2018).

PhD students: Cristina Ferenț (Tudose; 2011), Pompiliea Cozma (2012), Ionuț Dincă (2012), Doru Anastasiu Popescu (2012), Liviu Cristian Ştefan (2013), Irina Tudor (2013; co-supervised with Nicolae Țăndăreanu), Sorin Dincă (2015; co-supervised with Nicolae Țăndăreanu), Mihai Istrate (2015; co-supervised with Nicolae Țăndăreanu), Andrei Sabău (2017; co-supervised with Luminița State).

Books:

1. (with Ş. Gavrilă, H. Georgescu, M. Gheorghe, L. Sofonea, I. Văduva) *Programarea în limbajele Pascal şi Turbo Pascal*, Editura Tehnică, vol. 1 and vol. 2, 1992.

2. *Corectitudinea algoritmilor*, Editura Tehnică, 1995.

Representative articles:

1. Taxinomie des variantes d'une ballade populaire, in *La semiotique formelle du folklore*, Solomon Marcus, ed., Klincksieck, Paris, 1978, 20–42.

2. A Proof Rule for the "it ti" Generalized Control Structure, *Bulletin of the European Association for Theoretical Computer Science*, 24 (1984), 48–53.

3. (with M. Gheorghe) On Parsing the Sequence Syntax Diagram According to Hartmann's Method, *Foundations of Control Engineering*, 11, 1 (1986), 25–32.

4. (with M. Gheorghe, Gh. Păun) Three Variants of Apical Growth Filamentous Systems, *International Journal of Computer Mathematics*, 23 (1987), 227–238.

5. (with M. Gheorghe, Gh. Păun) On Fully Initial Grammars with Regulated Rewriting, *Acta Cybernetica*, 9 (1989), 157–165.

6. (with H. Georgescu, M. Gheorghe) On Counting Derivation in Grammar Systems, *Romanian Journal of Information Science and Technology*, 1, 1 (1998), 23–42.

7. Generalized Stream X-Machines with Output Delimited Type, *Formal Aspects of Computing*, 12 (2000), 473–484.

8. (with M. Gheorghe, M. Holcombe, F. Ipate) Eilenberg P Systems, *Membrane Computing. International Workshop, WMC* – CdeA 2002, *LNCS* 2597, Springer, 2003, 43–57.

9. (with F. Ipate) Refinement in Finite State Machine Testing, *Fundamenta Informaticae*, 64, 1–4 (2005), 191–203.

10. (with R. Nicolescu, H. Wu) Asynchronous P Systems, *International Journal of Natural Computing Research*, 2, 2 (2011), 1–18.

Further information:

Research grants:

Formal specification and verification of software systems, 1999. Granted by the National Committee for Coordinating Scientific Research in Romanian Universities, code CNCSIS 78, project manager.

Data Mining and Machine Learning for Intrusion Detection – MILEDI, Program A – CNCSIS 1158, 2007–2008, project manager.

Member of the research team: EMANICS – Excellence for the Management of Internet Technologies and Complex Services, the Sixth Framework of the European Comunity, contract number 026854: 2006–2008. Scientific coordinator: Oliver Festor, LORIA–INRIA, Lorraine, France. Leader of the research team of the University of Piteşti: Luminița State.

Member of the research team: DEPLOY – Industrial deployment of system engineering methods providing high dependability and productivity – the Seventh Framework of the European Community, contract number 214158: 2008–2012, Project Coordinator: Alexander Romanovsky, School of Computing Science, Newcastle University UK. Leader of the research team of the University of Piteşti: Florentin Ipate.

BĂUTU, Elena

Born on December 27, 1980, in Bârlad, Romania.

Education:
Faculty of Computer Science, "Al.I. Cuza" University, Iaşi, Romania (1999–2003); Master of Science in computational mathematics and modern computer technologies, at "Ovidius" University of Constanța, Romania (2003–2005).

PhD in artificial intelligence, "Al.I. Cuza" University, Iaşi, România, 2010. Thesis title: *Intelligent Techniques for Data Modeling Problems.* Scientific advisor: Henri Luchian.

Positions: Assistant Professor (2004–2014), lecturer (2014–present), "Ovidius" University of Constanța, Romania.

Research areas: Evolutionary computation, time series, classification.

Main results: the development of novel hybrid evolutionary methods for regression and classification problems.

Membership to professional organizations: Societatea de Ştiințe Matematice din România (SSMR), Romanian Computer Human Interaction Group (RoCHI).

Books:
1. (with A. Băutu) *Genetic Programming. Theory and Applications* (in Romanian), Editura Univ. "Al.I. Cuza", Iaşi, 2009 (200 pages).
2. *Intelligent Techniques for Data Modeling Problems*, Lambert Academic Publishing, 2012 (224 pages).
3. (with A. Bărbulescu, C. Maftei) *Modeling the Hydro-Meteorological Time Series. Applications to Dobrudja Region*, Lambert Academic Publishing, 2010 (136 pages).

Representative articles:
1. (with H. Luchian, A. Băutu) Genetic Programming Techniques with Applications in the Oil and Gas Industry, *Artificial Intelligent Approaches in Petroleum Geosciences*, Springer, 2015, 101–126.

2. (with A. Bărbulescu) Forecasting Meteorological Time Series Using Soft Computing Methods: An Empirical Study, *Appl. Math. Inf. Sci.*, 7, 4 (2013), 1297–1306.

3. (with A. Bărbulescu) A Hybrid Approach for Modeling Financial Time Series, *International Arab. Journal of Information Technology*, 9, 4 (2012).

4. (with C. Crânganu) Using Gene Expression Programming to Estimate Sonic Log Distributions Based on the Natural Gamma Ray and Deep Resistivity Logs: A Case Study from the Anadarko Basin, Oklahoma, *Journal of Petroleum Science and Engineering*, 70, 3–4 (2010), 243–255.

5. (with A. Bărbulescu) Mathematical Models of Climate Evolution in Dobrudja, *Theoretical and Applied Climatology*, 100, 1–2 (2010), 29–44.

6. (with A. Băutu, H. Luchian) Symbolic Regression on Noisy Data with Genetic and Gene Expression Programming, *Proc. Seventh International Symposium on Symbolic and Numeric Algorithms For Scientific Computing*, SYNASC, Timişoara, September 25–29, 2005, IEEE Computer Society, Washington, DC, 2005, 321.

7. (with A. Băutu, H. Luchian) A GEP-Based Approach for Solving Fredholm First Kind Integral Equations, *Proc. Seventh international Symposium on Symbolic and Numeric Algorithms For Scientific Computing*, SYNASC, Timişoara, September 25–29, 2005, IEEE Computer Society, Washington, DC, 2005, 325.

8. (with A. Băutu, H. Luchian) AdaGEP – An Adaptive Gene Expression Programming Algorithm, *Proc. Ninth international Symposium on Symbolic and Numeric Algorithms For Scientific Computing*, SYNASC, Timişoara, September 26–29, 2007, IEEE Computer Society, Washington, DC, 2007, 403–406.

9. (with S. Kim, A. Băutu, H. Luchian, B.-T. Zhang) Evolving Hypernetwork Models of Binary Time Series for Forecasting Price Movements on Stock Markets, *IEEE Congress on Evolutionary Computation* (CEC 2009), 2009, 166–173.

Further information: Contribution to several national and international research projects (2017): 1 as director and 10 as a member in the research team.

Personal web page: https://sites.google.com/site/elenabautu/

BOIAN, Florian Mircea

Born on October 18, 1947, Apold, Mureş county, Romania.

Education: Faculty or Mathematics, Computer Science Section, of "Babeş-Bolyai" Universty (UBB), Cluj-Napoca, 1971–1975.

PhD in mathematics, computer science specialization, UBB, Cluj-Napoca, 1986. Thesis title: *Sisteme conversaționale pentru instruire în programare*. Scientific advisor: Emil Muntean.

Scholarships, postdoc stages: CEEPUS, 2004, Univ. Klagenfurt, Austria; CEEPUS, 2000, Eötvös Loránd University Budapest, Hungary; TEMPUS, 1999, Granada University, Spain; TEMPUS, 1996, Bochum University, Germany.

Positions: Assistant Professor (1979–1990), lecturer (1990–1992), Associate Professor (1992–1997), Professor (from 1997), at the Faculty of Mathematics and Computer Science of "Babeş-Bolyai" Universty, Cluj-Napoca.

Analyst at the Computing Center of "Carbochim" Factory, Cluj-Napoca (1975–1976) and at the computer center of UBB, Cluj-Napoca (1976–1979).

Research areas: Algorithmics and concurrent and distributed programming (formal models, client-server mechanisms), distributed operating systems (distributed architectures, concurrent processes, specification models, security), web services, internet and intranet communication.

Administrative positions: Director of Communication Center of UBB (1994–2002), director of Computer Science Department (from 2008), the head of the Information Systems Chair (from 2008), member of the RoEduNet National Commission of Ministry of Education (from 1997), member of the Computer Science Commission of CNCSIS, Member of the UBB Senate.

Editorial boards: *International Journal of Intelligent Computing & Information Science* (Ain Shams University, Cairo, Egypt), *Carpathian Journal of Mathematics* (Baia Mare), *Creative Mathematics and Informatics* (Baia Mare), *Studia, Computer Science Series* (Cluj-Napoca), *Acta Technica Napocensis* (Cluj-Napoca), *Buletinul UPG Ploieşti.*

Membership to professional organizations: Romanian Society of Mathematical Sciences (from 1975); Association of Computing Machineries (1995); European Universities Informating Systems (1995); National Association of Romanian Computer Scientists (founding member, 1999).

Honors, prizes, scientific distinctions: UBB Prizes for the best scientific monograph (2002 and 2004) and for didactical activity (2006); Professor of the year (2008).

PhD students: Darius Vasile Bufnea (2008), Claudiu Cobârzan (2008), Adrian Ioan Sterca (2008), Horea Gavril Oros (2009), Laura Cacoveanu-Stoica (2014), Dan Cojocar (2015), Bogdan Crainicu (2015), Diana Troancă (2016), Diana Haliță-Sotropa (2017). Presently, four PhD students are preparing their theses.

Books:

1. *Servicii web; modele, platforme, aplicații*, Editura Albastră – Grupul Micro Informatica, Cluj- Napoca, 2011 (382 pages).
2. (with P. Mitrea, A. Sterca, E.N. Todoran) *Proceedings of GlobalComp: Workshop on Models, Semantics, Logics and Technologies for Global Computing*, U.T. Press, 2008 (250 pages).
3. (with A. Vancea, R. Boian, D. Bufnea, A. Sterca, C. Cobârzan, D. Cojocar) *Sisteme de operare*, Editura RISOPRINT, Cluj-Napoca, 2006 (350 pages).
4. (with R. Boian) *Tehnologii fundamentale Java pentru aplicații Web*, Editura Albastră – Grupul MicroInformatica, Cluj-Napoca, 2004 (469 pages).
5. (with C. Ferdean, R. Boian, R. Dragoş) *Programare concurentă pe platforme Unix, Windows, Java*, Editura Albastră – Grupul MicroInformatica, Cluj-Napoca, 2002 (420 pages).

Representative articles:

1. (with L. Cacoveanu, F. Stoica) A Distributed CTL Model Checker, *Proc. 10th International Joint Conference on e–Business and Telecommunications*, Reykjavik, Iceland, July 2013, 379–386.
2. (with A. Ploscar, R. Boian) Web Service Matching, *KEPT2013, Studia Univ. "Babeş-Bolyai"*, 58, 3 (2013),105–115.
3. (with D. Troancă) XRDL: A Valid Description Language for XML–RPC. *KEPT2013, Studia Univ. "Babeş-Bolyai"*, 58, 3 (2013), 90–104.
4. (with B. Pop) Comparative Study of Task Delegation Models in Software as a Service Project Management Applications, *KEPT2013, Studia Univ. "Babeş-Bolyai"*, 58, 3 (2013), 65–77.
5. (with M. Pop) Building an Automated Task Delegation Algorithm for Project Management and Deploying it as SaaS, *Studia Univ. "Babeş-Bolyai"*, 58, 1 (2013), 58–70.

6. Web Services: Models, Equivalence Transformations, Frameworks, Implementations (Plenary Speaker), *Proc. Second International Conference on Modelling and Development of Intelligent Systems – MDIS*, Sibiu, Romania, September 29–October 02, 2011, 1–2.

7. (with B. Crainicu) Some Combinatorial Aspects of the KSA m-Like Algorithms Suitable for RC4 Stream Cipher, *Studia Univ. "Babeş-Bolyai"*, 25, 1 (2010), 105–114.

8. Web Services: Definitions, Models, Teaching Aspects, *Proc. 8th Joint Conference on Computer Science, MaCS 2010*, Komarno, Slovakia, July 14–17, 2010, 109–122.

9. (with D. Chinceş, D. Ciupeiu, D. Homorodean, B. Jancso, A. Ploscar) WSWrapper – A Universal Web Service Generator, *Studia Univ. "Babeş-Bolyai"*, 25, 4 (2010), 59–69.

Personal web page: www.cs.ubbcluj.ro/~florin

BONCHIŞ, Cosmin

Born on March 31, 1980, in Arad, Romania.

Education: Faculty of Mathematics and Computer Science, West University of Timişoara, 1998–2002.

Master: LaBRi, University of Bordeaux 1 Science and Technology, France, 2002–2003; Faculty of Mathematics and Computer Science, West University of Timişoara, 2002–2004.

PhD: West University of Timişoara, 2004–2009. Thesis title: *Arithmetics and Information Theory in Membrane Computing*. Scientific advisor: Ştefan Măruşter (co-advisor Gabriel Ciobanu).

Scholarships: E-Austria Research Institute, postdoc, 2010–2012.

Positions: Lecturer, Faculty of Mathematics and Computer Science, West University of Timişoara, 2010 – present; Researcher, E-Austria Research Institute, 2004 – present.

Research areas: Theoretical computer science: information theory, optimisation algorithms, membrane computing, data compression, combinatorics.

Main results: Partition into heapable sequences, heap tableaux and a multiset extension of Hammersley's process, minimum entropy submodular set cover problem, information theory over multisets.

Representative articles:

1. (with G. Istrate) Heapability, Interactive Particle Systems, Partial Orders: Results and Open Problems, *Descriptional Complexity of Formal Systems, LNCS* 9777, Springer, 2016, 18–28.
2. (with G. Istrate, L.P. Dinu) The Minimum Entropy Submodular Set Cover Problem, *Language and Automata Theory and Applications, LNCS* 9618, Springer, 2016, 295–306.
3. (with G. Istrate) Partition Into Heapable Sequences, Heap Tableaux and a Multiset Extension of Hammersley's Process, *Proc. 26th Annual Symposium on Combinatorial Pattern Matching, LNCS* 9133, Springer, 2015, 261–271.

4. (with G. Istrate) Improved Approximation Algorithms for Low-Density Instances of the Minimum Entropy Set Cover Problem, *Information Processing Letters*, 114, 7 (2014), 360–365.

5. (with C. Izbaşa, G. Ciobanu) Information Theory Over Multisets, *Computing and Informatics*, 27, 3 (2008), 441–451.

6. (with C. Izbaşa, G. Ciobanu) Compositional Asynchronous Membrane Systems, *Progress in Natural Science*, 17, 4 (2007), 411–416.

Personal web page: http://tcs.ieat.ro/members/cosmin–bonchis/

CALUDE, Cristian Sorin

Born on April 12, 1952, in Galați, Romania.

Education: BSc (Honours), Faculty of Mathematics, University of Bucharest, 1975.

PhD: Faculty of Mathematics, University of Bucharest, 1976. Thesis title: *Categorical Methods in Computation Theory*. Scientific advisor: Solomon Marcus.

Positions: Researcher (1978–1981), Assistant Professor (1981–1989), Associate Professor (1990–1993), Professor (1993–2000) at the University of Bucharest. Lecturer (1992–1993), Chair Professor (1993 on) at the University of Auckland. Visiting Professor in 25 universities, including École Normale Supérieure, Paris, École Politechnique, Paris, University of Chicago, National University of Singapore, Australian National University, Hong Kong University of Science and Technology, Japan Advanced Institute of Science and Technology (Monbusho Visiting Professor). Guest Professor, Sun Yat-Sen University, Guangzhou, China (2017–2020). Visiting Researcher in 10 institutes including Isaac Newton Institute of Mathematical Sciences (Cambridge University), IBM (New York), Google (Mountainview), Sandia Labs (Albuquerque), Microsoft (Trento), International Solvay Institutes (Brussels). Consultant for the Quantum Computing Research Initiatives at Lockheed Martin, USA (2013 on).

Research areas: Algorithmic information theory, quantum theory, complexity theory, philosophy of mathematics and computer science.

Main results: S. Marcus gave a detailed presentation of Calude's contributions in his paper „The art of reaching the age of sixty", in M.J. Dinneen, B. Khoussainov, A. Nies, eds., *Computation, Physics and Beyond*, *LNCS* 7160, Springer, Berlin, 1–19.

The following list is a summary of his main results:

a) Calude, S. Marcus, and I. Țevy proved that Sudan and Ackermann functions are the first examples of recursive and non-primitive functions, examples constructed simultaneously and independently in 1927, to solve in the affirmative a problem posed by D. Hilbert.

b) He developed a constructive Baire category theory with multiple applications in computability, complexity, independence and randomness (the class of recursive

functions is constructively second Baire category – that is, large – while any complexity class is constructively meagre – small –, the set of true but unprovable statements in a consistent formal system which is recursively enumerable is constructively co-meagre (large) and, in contrast with Martin-Löf theorem, the set of algorithmically random sequences is constructively meagre (small topologically, but large in measure), all un-intuitive results).

c) The last asymmetry was rectified in a joint paper with S. Marcus and L. Staiger in which a class of topological spaces not "far away" from the standard one was constructed and in these spaces the set of algorithmically random sequences is constructively second Baire category.

d) Chaitin–Calude–Hertling–Khoussainov–Wang–Kucera–Slaman theorem for left-computable random reals: they are exactly the halting probabilities of all self-delimiting universal Turing machines.

e) Calude's extension of Solovay's theorem on Ω numbers for which ZFC cannot compute any bit (G. Chaitin proved that ZFC cannot compute more than finitely many bits of any Ω number) and related results.

f) The initiation with A. Nies of the study of Ω numbers with strong reducibilities.

g) The development, in his Springer monograph *Information and Randomness* (1996/2002), of a non-binary algorithmic information theory, which paved the way for applications of this theory of algorithmic randomness in quantum physics, in particular, in the study of quantum randomness.

h) The probabilistic solution of the Halting Problem – the famous problem proved incomputable by A. Turing – in a sequence of articles (in collaboration with D. Desfontaines, M. Dumitrescu, and M. Stay).

i) The initiation of a weaker but decidable theory of algorithmic randomness based on finite transducers with potential more practical applications (with K. Salomaa, L. Staiger, F. Stephan, T. Roblot).

j) The quasi-polynomial algorithm for the game parity problem (with S. Jain, B. Khoussainov, W. Li, F. Stephan). Bridging computing and complexity theories with theoretical physics was a trend in his work in the last 20 years: his first results (with E. Calude, M. Lipponen, C. Ştefănescu-Cuntze, K. Svozil, S. Yu) concerned automata-theoretic models for quantum complementarity, a series of theoretical and experimental papers trying to understand the limits of quantum computing (with A. Abbott, M. Cavalieri, R. Mardare, K. Svozil), his surprising proof that the famous Deutsch's problem can be solved classically with the same amount of resources as quantum mechanically (he coined the term "de-quantisation" for the process of extracting a classical algorithm from a quantum black-box algorithm, which solves the same problem and is as performant as the original one), the work with M. Stay that revealed strong relations between Heisenberg uncertainty principle and Gödel's incompleteness phenomenon leading to an algorithmic version of statistical mechanics based on zeta functions associated with Turing machines, the

first mathematical approach to quantum randomness (with A. Abbott, J. Conder, M. Dinneen, K. Svozil) giving rise to the theoretical design of the first, and to date unique, 3D quantum random number generator proved to produce strong incomputable sequences of bits which are maximally unpredictable, that was physically realised in the lab by the group physicists from Queensland University, Australia lead by dr. A. Fedorov, and finally the theoretical and experimental work (with E. Calude, M.J. Dinneen, R. Hua) on quantum annealing and the D-Wave series of quantum computers. He combined theory with experimental work in mathematics and physics: computing the first exact 64 bits of a number Ω (with M. Dinneen and C.-K. Shu), perfecting mathematical randomness tests to evidence incomputability (with A. Abbott, M. Dumitrescu, M.J. Dinneen, N. Huang, K. Svozil) and using for the first time proof-assistants (*Isabelle* and *Coq*) to prove new results in algorithmic information theory (N. Hay, F. Stephan, D. Thompson). His work on unconventional computing includes i) methods to compute the incomputable (with V. Adamyan, M.J. Dinneen, B. Pavlov, L. Staiger, K. Svozil); ii) the joint book with Gh. Păun, *Computing with Cells and Atoms* (2001), one of the first and frequently cited monographs in this area.

Administrative positions: Founding director of the Centre for Discrete Mathematics and Theoretical Computer Science (1995 on) at the University of Auckland. Founding chair of the international series of conferences *Unconventional Computation and Natural Computation*. Member of the steering committee of the series of conference *Developments in Language Theory* and IEEE Task Force Unconventional Computing, IEEE Computational Intelligence Society. Horizon 2020 expert evaluator, European Commission.

Editorial boards: Member in the editorial boards of 22 international journals including *Journal of Universal Computer Science* (founding co-editor-in-chief), *Mathematical Structures in Computer Science, Theoretical Computer Science, Fundamenta Informaticae, International Journal of Foundations of Computer Science, International Journal of Unconventional Computing, unoMolti. Modi della Filosofia*. editor-in-chief *Discrete Mathematics and Theoretical Computer Science Book Series*, Springer, London (1996–2004). Member of the Advisory Board of *Monographs in Theoretical Computer Science. An EATCS Series* and *Texts in Theoretical Computer Science. An EATCS Series*, Springer, Heidelberg (from 2004 on).

Member of 15 professional organizations including, American Mathematical Society, European Association for Theoretical Computer Science, European Association for Computer Science Logic, FIP TC1, Foundations of Computer Science.

Honors, awards: 22 distinctions including STOC 2017 Best Paper Award, ACM, 21st Annual Best of Computing Book, Computing Reviews, 2013 R.R. Hawkins

Award, The American Publishers Awards for Professional and Scholarly Excellence. Member of Academia Europaea (2008), Hood Fellow (2008–2009), Award for Excellence in Research, University of Bucharest (2007), "Gheorghe Lazăr" Mathematical Prize, Romanian Academy (1988), Computing Reviews Award, ACM (1986).

Graduate students: 34 MSc students including V. Vieru (1981), A.M. Sălăgean (1989), N. Duță (1991), I. Macarie (1991), I. Măndoiu (1991), S. Legg (1996), N. Hay (2007), D. Thompson (2016). 17 PhD students including M. Zimand (1991), C. Câmpeanu (1995), A. Arslanov (1998), C. Grozea (2003), H. Zenil (2011), M. Stay (2015), A. Abbott (2015). Post-doctoral Fellows: Richard Coles (1988–1999), P. Hertling (1996–1998), Y. Wang (1997), M. Lipponen (1997–1998).

Books: 43 (authored, co-authored, edited or co-edited), including:

1. *The Human Face of Computing*, Imperial College Press, London, 2015.
2. *Information and Randomness: An Algorithmic Perspective*, Springer, Berlin, 2002, 2nd Edition.
3. (with Gh. Păun) *Computing with Cells and Atoms*, Taylor & Francis, London, 2001.
4. C.S. Calude. *People and Ideas in Theoretical Computer Science*, Springer, Singapore, 1998.
5. *Theories of Computational Complexity*, North-Holland, Amsterdam, 1988.

Representative articles (Orcid ID: http://orcid.org/0000–0002–8711–6799): more than 270 articles including

1. (with M. Dumitrescu) A Probabilistic Anytime Algorithm for the Halting Problem, *Computability*, published online May 2017.
2. (with S. Jain, B. Khoussainov, W. Li, F. Stephan) Deciding Parity Games in Quasipolynomial Time, *Proc. 49th Annual ACM SIGACT Symposium on the Theory of Computing*, Montreal, Canada, 2017, 252–263.
3. (with G. Longo) The Deluge of Spurious Correlations in Big Data, *Foundations of Science*, 22, 3 (2017), 595–612.
4. (with A.A. Abbott, K. Svozil) A Variant of the Kochen–Specker Theorem Localising Value Indefiniteness, *Journal of Mathematical Physics*, 56 (2015), 102201.
5. (with E. Calude, M.J. Dinneen) Adiabatic Quantum Computing Challenges, *ACM SIGACT News*, 46, 1 (2015), 40–61.
6. (with A.A. Abbott, J. Conder, K. Svozil) Strong Kochen–Specker Theorem and Incomputability of Quantum Randomness, *Physical Review*, *A* 86, 6 (2012).
7. (with P. Hertling, B. Khoussainov, Y. Wang) Recursively Enumerable Reals and Chaitin Ω Numbers, *Theoret. Comput. Sci*., 255 (2001), 125–149.
8. (with G.J. Chaitin) Randomness Everywhere, *Nature*, 400, 22 July (1999), 319–320.

9. (with J.L. Casti) Parallel Thinking, *Nature*, 392, 9 April (1998), 549–551.

10. (with S. Marcus, I. Țevy) The First Example of a Recursive Function Which Is Not Primitive Recursive, *Historia Math*., 9 (1979), 380–384.

Further information: His works have been cited by more than 5,500 papers and 120 books by 550 authors, including eminent computer scientists (Scott Aaronson, Martin Davis, Yuri Gurevich, Donald E. Knuth, Anil Nerode, Arto Salomaa, Joseph F. Traub, Stephen Wolfram), mathematicians (Jonathan Borwein, Michel Deza, Shmuel Gal, Yuri I. Manin, Yuri V. Matiyasevich, Harald Niederreiter, Saharon Shelah, Craig Smoryński, Vladimir A. Uspensky), physicists (Luigi Accardi, John D. Barrow, Seth Lloyd, Anton Zeilinger, Umesh Vazirani), linguist (Noam Chomsky) and logician (Jaakko Hintikka). Some of his results have been presented in science magazines like *New Scientist, Pour La Science, Innovate!* (Quarterly magazine of *Suddeutsche Zeitung*), *Corriere della Sera* (science section), *Quanta Magazine* and in many books for larger audiences like J. Barrow. *Impossibility*, Oxford University Press, 1998, A.A. Bolibruch, Yu.S. Osipov, Ya.G. Sinai, eds. *Mathematical Events of the Twentieth Century*, Springer, Berlin, 2006, B. Carpenter. *Network Geeks*, Copernicus Books, London, 2013, G.J. Chaitin. *The Limits of Mathematics*, Springer, Singapore, 1998, J.-P. Delahaye. *La Logique, un Aiguillon pour la Pensée*, Pour la Science, Paris, 2012, J. Gleick. *The Information: A History, A Theory, A Flood*, Pantheon Books, Toronto, 2011.

Featured in Wikipedia, https://en.wikipedia.org/wiki/Cristian_S._Calude (also in Deutsch, Français, Português, Română). He appears in the novel A. Sangalli. *Pythagoras' Revenge: A Mathematical Mystery*, Princeton University Press, 2009, the bits of the number Ω, he calculated with M.J. Dinneen and C.-K. Shu, have been "used" in the CBS (US drama) TV show *Numb3rs* (season 5; episode 5; scene 6) and his *Nature* joint paper with G. Chaitin has inspired R.M. Chute's Poem on Ω number (*Beloit Poetry Journal Spring*, 50, 3 (2000), p. 8). Althought most of my students have been trained in theoretical computer science, a few excel in IT companies: Dr. S. Legg, researcher and co-founder of Google DeepMind Technologies, London, M. Talpeş (Mereuță), co-founder of SOFTWIN and Bitdefender, Bucharest, etc.

In his ever-vanishing spare time he plays tennis and keyboard.

Personal webpage: www.cs.auckland.ac.nz/~cristian

CALUDE, Elena

Born on January 4, 1953, in Constanța, Romania.

Education: BSc (Honours) with the thesis *Mathematical Analysis of the Drama "Long Days Journey Into Night" by E. O'Neill*, supervisor Solomon Marcus, Faculty of Mathematics, University of Bucharest, 1975.

PhD: University of Auckland, 1998. Thesis title: *Automata-Theoretic Models for Computational Complementarity*. Scientific advisor: H. Guesgen.

Positions:

Mathematics teacher, 1975–1992 (Bucharest).

Tutor (mathematics and computer science), University of Auckland, New Zealand (1993–1999).

Lecturer and senior lecturer, Massey University at Albany, Auckland, New Zealand (1999 on).

Visiting fellow, Japan Institute for Advanced Study, Japan (November 1999).

Visiting Associate Professor, Effat College, Jeddah, Saudi Arabia (2003–2004).

Visiting Professor, Chuo University, Tokyo, Japan, (January 2013).

Associate researcher Centre for Discrete Mathematics and Theoretical Computer Science, University of Auckland (1995 on).

Research areas: Automata theory and applications to quantum mechanics and quantum computation, discrete mathematics, complexity theory, quantum annealing.

Main results:

A metric method for multicriteria decision making which has multiple applications, including a recommendation program.

Work in automata theory, specifically, studying the behavioural aspects of non-deterministic automata (simulation, universality and minimalist) – cooperation with C. Calude (UoA), B. Khoussainov (UoA), M. Lipponen (Turku Univ).

A joint work with M. Burgin (UCLA), C. Calude (UoA), M.J. Dinneen (UoA), M. Queen (Dartmouth University) on an algorithmic method for evaluating the complexity of mathematical statements. The method was applied to a variety of mathematical open problems and well-known theorems including the Riemann Hypothesis, **P** vs. **NP**, Fermat theorem, the Four Colour theorem.

Cooperation with C. Calude (UoA), T. Chiu (UoA), M. Dumitrescu (Bucharest Univ.), R. Nicolescu (UoA), K. Svozil (TUV), C. Ştefănescu (ESMT, Berlin), S. Yu (UWO) to use automata theory to model phenomena in quantum physics, for example, quantum complementarity and chaoticity.

Recent work on quantum annealing and programming the D-Wave quantum machine and on quantum computational supremacy.

Editorial boards: *International Journal of Engineering Research and Applications, Journal of Global Research in Computer Science, International Journal of Advanced Research in Computer Science, Research Letters in the Information and Mathematical Science* (Massey University).

Member of professional organizations: Auckland CS Theory Colloquium, NZMS, and ANZIAM.

Honors, awards: Nominated "Lecturer of the Year", Massey University at Albany, 2012, 2016.

Books:

1. *Principles of Computing*, Department of Computer Science, The University of Auckland, Auckland, 1995 (viii + 154 pages).

2. (with C.S. Calude, M.J. Dinneen, eds.). *Proc. 8th International Conf. Developments in Language Theory, DLT*'04, *LNCS* 3340, Springer, Heidelberg, 2004 (442 pages).

Representative articles:

1. (with C.S. Calude, M.J. Dinneen) Adiabatic Quantum Computing Challenges, *ACM SIGACT News*, 46, 1 (2015), 40–61.

2. (with M. Burgin, C.S. Calude) Inductive Complexity Measures for Mathematical Problems, *International Journal of Foundations of Computer Science*, 24, 4 (2013), 487–500.

3. (with C.S. Calude, M.S. Queen) The Complexity of Euler's Integer Partition Theorem, *Theoretical Computer Science*, 454 (2012), 72–80.

4. Fermat's Last Theorem and Chaoticity, *Natural Computing*, 11, 2 (2012), 241–245.

5. The Complexity of Riemann's Hypothesis, *Journal for Multiple-Valued Logic and Soft Computing*, 17, 4 (2011), 1–9.

6. (with C.S. Calude) The Complexity of the Four Colour Theorem, *London Mathematical Society Journal of Computation and Mathematics*, 13 (2010), 414–425.

7. (with C.S. Calude) Evaluating the Complexity of Mathematical Problems. Part 1+2, *Complex Systems*, 18 (2009), 267–285, 18 (2010), 387–401.

8. (with C.S. Calude, S. Marcus) Passages of Proof, *Bull. Eur. Assoc. Theor. Comput. Sci.*, 84 (2004), 167–188.

9. (with M. Lipponen) Minimal Deterministic Incomplete Automata, *J. UCS*, 11 (1997), 1180–1193.

10. (with C.S. Calude, B. Khoussainov) Deterministic Automata: Simulation, Universality and Minimality, *Annals of Applied and Pure Logic*, 90 (1997), 263–276.

Further information:

More than 400 citations by more than 50 authors.

Invited lectures: 18 lectures at universities and international conferences including Chuo University, Tokyo, Japan Institute for Advanced Study, Technical University Vienna, Waikato University, *UCNC 2012* (Orléans, France), *DLT 2001* (Vienna, Austria), *UMC 1997* (Auckland).

Program Committee: IADIS WWW/Internet, http://www.internet–conf.org, 2007–2017, WEBIST, http://www.webist.org, 2007–2017.

Conference organiser: Unconventional Computing and Natural Computing 2015, Auckland, Third International Conference Discrete Mathematics and Theoretical Computer, Constanța, Romania, 2001, Australian Computer Science Week, ACSW'99, Auckland, 1999, First International Conference UMC'98, Unconventional Models of Computation, Auckland, 1998.

Personal webpage: http://www.massey.ac.nz/~ecalude/

CĂRĂUŞU, Alexandru

Born on April 1, 1942, in Chişinău, Bassarabia, Kingdom of Romania.

Education: "Al.I. Cuza" University of Iaşi, Faculty of Mathematics-Mechanics, 1960–1965.

PhD: University of Bucharest, 1980. Thesis title: *Contributions to the Theory of Formal Languages with Restrictions of Context and Order* (in Romanian). Scientific advisor: Solomon Marcus.

Scholarships: Universities Paris VI and VII, scholarship from Ministère des Affaires Etrangères de France (three months, 1976).

Positions:

Assistant (1966–1970), lecturer (1970–1978), Faculty of Mathematics, "Al.I. Cuza" University of Iaşi.

Lecturer (1978–1991), Associate Professor (1991–2007), Department of Mathematics, "Gh. Asachi" Technical University of Iaşi.

Research areas: Mathematical linguistics – theory of formal languages; probabilistic methods in structural reliability and seismic risk assessment; mathematical biology – population dynamics.

Main results: Introducing the operations of string intersection and short concatenation, as well as order relations as scattered subword in formal languages/free monoids. The closure properties of the main abstract families of languages in the Chomsky hierarchy under the two operations were established in a joint paper with Gh. Păun ([4] in the list of papers). These two operations were also considered in paper [10], in connection with certain types of morphisms defined on sets of strings endowed with specific operations. The properties of a norm-type function proposed in a paper by C. Reischer and D. Simovici are discussed. It was proved that the string length is a quasinorm with respect to the string concatenation and it is closer to the properties of a norm under the short concatenation. The properties of formal languages (generated by Chomsky-type grammars) to be left-recursive/right-recursive are extended from context-free languages to type 1 (context-sensitive) and type 0 (general phrase-structure) languages, and characterizations are given in [7].

In author's thesis was established a relationship of duality between two types of representation for the derivations yielding a formal language, namely the syntactic graphs of Loeckx-Hart and the G-graphs of Th.N. Hibbard. It is a relation of duality between planar graphs and it was also described in paper [5].

The paper [6] deals with modelling the temporal system of French grammar by means of the temporal logic.

Editorial boards: *Mathematical Recreations* (magazine for professors and students, 2 issues a year since 1999).

Membership to professional organizations: Society of Mathematical Sciences of Romania, since 1975; Centro Superiore di Logica e Scienze Comparate – Bologna (Italia), 1972; IA SMiRT – International Association for Structural Mechanics in Reactor Technology, since 1995; "Mathematical Recreations" Association (Iaşi), since 2005.

Books:

1. *Linear Algebra – Theory & Applications*, Matrix Rom Publishers, Bucharest, 1999 (380 pages).
2. *Vector Algebra, Analytic and Differential Geometry*, vol. I, PIM Publishers, Iaşi, 2003 (530 pages).
3. *Vector Algebra, Analytic and Differential Geometry*, vol. II, *A Problem Book*, PIM Publishers, Iaşi, 2005 (334 pages).

Representative articles:

1. On Strong Structural Properties of Context-Sensitive Languages, *Proc. of INFORMATICA – the 6th Yugoslav International Symposium on Information Processing*, Bled (Slovenija), September 23–26, 1970, Section B–2, 1–4.
2. On a Natural Ordering of Rules in Context-Sensitive Grammars, *Proc. of the Eleventh International Congress of Linguists* (Bologna–Firenze, August 28 – September 2, 1972), vol. II, Società editrice il Mulino, Bologna 1975, 1037–1045.
3. Precedence Parsers of Context-Sensitive Langauges, *Proc. Symposium INFORMATICA – 9th Yugoslav International Symposium on Information Processing*, Bled (Slovenija), October 7–12, 1974, Section 1.29, 1–12.
4. (with Gh. Păun) String Intersection and Short Concatenation, *Revue Roumaine de Mathématiques Pures et Appliquées*, 26, 5 (1981), 713–726.
5. On the Relationship Between the Syntactic Graphs of Loeckx-Hart and Hibbard's G-Graphs, *Mathematical Researches* – supplement to *Bulletin Polytechnic Inst. of Iaşi*, 1985, 213–217.
6. (with V. Agrigoroaiei) Modèles logico-temporels pour représenter des structures temporelles du français (une extension du Système K_t), *Revue Romaine de Linguistique*, 32, 2 (1987), 171–181.

7. Recursive Languages of Types 0 and 1 (in Romanian), *Proc. Jubilee Sci. Session* "*175 Years of Technical Higher Education in Romanian language*", Iaşi, Nov. 10–12, 1988, vol. V, Section XI (Algebra – Geometry), 77–80.

8. (with A. Vulpe) Fragility Estimation for Seismically Isolated Nuclear Structures by HCLPF Values and Bi-Linear Regression, *Nuclear Engineering and Design* (special issue – selected & extended papers of SMiRT 12 Conf., Section M), Elsevier – North Holland Sci. Publishers, 160 (1996), 287–297.

9. Semigroups of Linear Operators and Semi-Markov Models for the Dynamics of Unicellular Populations (I), *Proc. Annual Symposium on Mathematics Applied in Biology & Biophysics*, UASVM – Iaşi, May 30–31, 2002*, Scientific Annals of University of Agricultural Sciences and Veterinary Medicine* "*Ion Ionescu de la Brad*" *Iaşi*, XLV (2002), Faculty of Horticulture, 55–64.

10. Morphisms and Quasinorms Over Free Semigroups, *Advances in Abstract Algebra* (I. Tofan, M. Gontineac, M. Tărnăuceanu, eds.), Ed. Alexandru Myller, Iaşi, 2006, 55–65.

Personal web page: math.etc.tuiasi.ro/ac/

CÂMPEANU, Cezar

Born on January 1965, in Bucharest, Romania.

Education: University of Bucharest, Faculty of Mathematics, Computer Science (1984–1988).

PhD in mathematics/computer science, University of Bucharest, 1995. Thesis title: *Topological Methods in Computational Complexity.* Scientific advisor: Cristian S. Calude.

Scholarships, postdoc stages: Postdoc in computer science, University of Western Ontario, London, Canada, 1997–1998; Postdoc in computer science, Queen's University, Kingston, Canada, 2001.

Positions:

Systems analyst, "ROMLUX" – Târgovişte, Romania, November 1988 – December 1989.

Systems analyst, Institute of Computer Science, Bucharest, January 1990 – February 1991.

Research assistant (1991–1992) and Assistant Professor (1992–1997) at Faculty of Mathematics, University of Bucharest.

System engineer, RoEduNet, Bucharest, Romania, November 1999 – December 2000.

Senior staff scientist, Compression Science Romania, January 2001.

Senior lecturer, Faculty of Mathematics, University of Bucharest, February 1997 – January 2001.

Assistant Professor (2001–2006), Associate Professor (2006–2014), and full Professor (since 2014) at Computer Science and Information Technology Department, University of Prince Edward Island, Charlottetown, PEI, Canada.

Research areas: Automata theory and implementation, complexity theory, algorithmic information theory, formal languages, finite transducers, biocomputing and bioinformatics.

Main results:

Introduction of deterministic/nondeterministic finite cover automata.

First results in the study of state complexity of finite languages (WIAA 99).

Formalization of practical regular expressions used in various UNIX or programming environments and proposed an alternative formalism: pattern expressions.

Introduced the operation of distinguishability/dissimilarity for words, languages, and states.

Proof that we can have an unified descriptional complexity theory based on Blum axioms and Burgin axioms. In this new framework we can prove all the important results for Kolmogorov complexity that are true for both plain and prefix-free complexity in an uniform way. Moreover, algorithmic randomness can be defined in the new framework and we can establish a better connection with Martin-Löf randomness. Descriptional complexity such as state complexity and other types of complexities that use the principle of minimal decription length can be defined in this new axiomatic framework.

Administrative positions:

Interim UPEI co-op director, CSIT, UPEI, Canada, January – June 2008, January – June 2014.

University of Bucharest, Faculty of Mathematics Council Member, 1997–2001.

Member of Executive Committee of UPEIFA (UPEI Faculty Association) May 2012 – May 2016.

Member of UPEI Research Grant Committee (January 2006 – August 2008).

APICS (Atlantic Provinces Council on the Sciences – Now Science Atlantic) UPEI Computer Science representative (starting 2012).

Membership to professional organizations: International Federation for Information Processing, Technical Committee 1: Foundations of Computer Science Working Group 1.02: Descriptional Complexity (IFIP WG1.02).

Representative articles:

1. (with K. Culik II, K. Salomaa, S. Yu) State Complexity for Basic Operations on Finite Languages, *WIA* '99, Potsdam, Germany, 1999.

2. (with K. Salomaa, S. Yu) State Complexity of Regular Languages: Finite Versus Infinite, *Finite VS Infinite, Contributions to an Eternal Dilemma* (C. Calude, Gh. Păun, eds.), Springer, Berlin, 2000.

3. (with N. Sântean, S. Yu) Finite Languages and Cover Automata, *Theoretical Computer Science*, 267, 1–2 (2001), 3–16.

4. (with K. Salomaa, S. Yu) A Formal Study of Practical Regular Expressions, *International Journal of Foundations of Computer Science*, 14, 6 (2003), 1007–1018.

5. (with S. Yu) Pattern Expressions and Pattern Automata, *Information Processing Letters*, 92, 6 (2004), 267–274.

6. A Note on Blum Static Complexity Measures, *International Workshop on Theoretical Computer Science, WTCS* 2012, *Dedicated to Cristian S. Calude on the Occasion of His 60th Birthday*, Auckland, New Zealand, Invited Paper, February 2012.

7. Descriptional Complexity in Encoded Blum Static Complexity Spaces, *International Journal of Foundations of Computer Science*, 25, 7 (2014), 917–932.

8. Nondeterministic Finite Cover Automata, *Scientific Annals of "Al.I. Cuza" University, Iaşi*, XXV, 1 (2015), 3–28.

9. (with N. Moreira, R. Reis) Distinguishability Operations and Closures, *Fundamenta Informaticae*, 148, 3–4 (2016), 243–266.

10. Blum's and Burgin's Axioms, Complexity, and Randomness, *Information and Complexity: World Scientific Series in Information Studies*, 6 (2017), 33–52.

Further Information: Chair of CIAA2018, co-chair DCFS – 2008, DCFs – 2016, DCFS – 2017, member in program committee of several conferences (CIAA, DCFS, NCMA, TCS) in several years. Invited editor for special issues of DCFS – 2008 in epTCS/TCS , DCFS – 2016 in JALC, DCFS – 2017 in IJFCS, CIAA – 2018 in IJFCS

Personal web page: http://www.smcs.upei.ca/~ccampeanu

CETERCHI, Rodica

Born on December 2, 1953, in Cluj-Napoca, Romania.

Education:

BSc in mathematics, 1972–1976, University of Bucharest, Faculty of Mathematics. Licentiate thesis: *The Samuel Stratification of the Discriminant is Whitney Regular*, advisor: Dan Burghelea.

Master in mathematics, 1976–1977, University of Bucharest, Faculty of Mathematics. Thesis title: *The Prediction of Second-Order Stochastic Processes.* Scientific advisor: Silviu Guiaşu.

PhD in mathematics, 1989–1991, University of Bucharest, Faculty of Mathematics. Thesis title: *Topology, Categories, Learning.* Scientific advisor: Solomon Marcus.

Habilitation, April 28, 2017, University of Bucharest, Faculty of Mathematics and Computer Science. Thesis title: *Non-Classical Models: Pseudo-Hoops and Applications of P Systems.*

Scholarships, postdoc stages:

2002 May – 2003 October: visiting researcher at GRLMC (Research Group on Mathematical Linguistics), University Rovira i Virgili, Tarragona, Spain, with a sabbatic grant from the Ministry of Education, Culture and Sports of Spain..

1997 April – May: University of Bordeaux I, I.U.T. A, France, TEMPUS individual mobility grant.

1993 September: Invited Associate Professor, University of Nice, Sophia – Antipolis, ISSS, France.

1992 July – August: Visiting Professor, Sheffield City Polytechnik, UK.

1984 April – June: participation to the First Course on the Development Problematique, at Fundación Bariloche, San Carlos de Bariloche, Argentine, with a fellowship from the United Nations University.

Positions:

Teaching Assistant (1992–1994), Senior Lecturer (1994–2002), Associate Professor (2002–2017), Professor (2017–present), Faculty of Mathematics and Computer Science, University of Bucharest, Computer Science Department.

1987–1992, Programmer, Computing Center, University of Bucharest.

1981–1987, Researcher, System Studies Division, University of Bucharest.

1977–1981, Analyst-programmer, Computing Center, IPGGH (Institute for Geological and Geophysical Prospecting) Bucharest.

Research areas: Topology, universal algebra, MV algebras, Wajsberg algebras, pseudo-hoops, applications to many-valued logics; algebra and category theory, their applications to computer science, algebraic models for the semantics of programs; formal languages (contextual languages and grammars, 2D-languages); unconventional models of computation (natural computing, membrane computing, splicing).

Main results: Introduction of the concept of pseudo-Wajsberg algebra. A unified construction for the decomposition of linear pseudo-hoops. Applications of P systems to sorting, to the simulation of Boolean circuits and of parallel architectures, to the generation of 2D languages.

Membership to professional organizations: SSMR (Romanian Mathematical Society)**,** IASS (International Association of Semiotic Studies); IMCS (International Membrane Computing Society), CiE (Association Computability in Europe), GLAU (Group of Logic and Universal Algebra – Faculty of Mathematics and CS).

Honors, prizes, scientific distinctions:

The "Grigore C. Moisil" Prize of the Romanian Academy, 2003.

Books and book chapters:

1. *Data Structures and Algorithms: Mathematical Aspects and Applications. Part I. Elementary Data Structures* (in Romanian), Edit. Univ. Bucureşti, 2001 (177 pages).

2. *Marcus Contextual Grammars,* chapter 17 of *Formal Languages and Applications* (C. Martín-Vide, V. Mitrana, Gh. Păun, eds.), vol. 148, Studies in Fuzziness and Soft Computing Series, Springer, Berlin, 2004, 335–366.

3. (with D. Sburlan) *Membrane Computing and Computer Science*, Chapter 22 in *The Oxford Handbook of Membrane Computing* (Gh. Păun, G. Rozenberg, A. Salomaa, eds.), Oxford University Press 2010, 554–583.

4. Modeling DNA Recombinant Behavior with Fixed-Point Equations, in *Computing with Bio-Molecules: Theory and Experiments* (Gh. Păun, ed.), Springer, Singapore 1998, 340–352.

5. (with C. Martín-Vide, K.G. Subramanian) On Some Classes of Splicing Languages, in *Aspects of Molecular Computing: Essays in Honor of the 70th Birthday of Tom Head* (N. Jonoska, Gh. Păun, Gr. Rozenberg, eds.), *LNCS* 2950, Springer, Berlin, 2004, 84–105.

Representative articles:

1. A Localization Theorem for Topological Categories, *Stud. Cerc. Mat.,* 42, 1 (1990), 3–8.

2. Pseudo-Wajsberg Algebras, *Multi. Val. Logic*, 6, 1–2 (2001), 67–88.

3. (with M. Mutyam, Gh. Păun, K.G. Subramanian) Array-Rewriting P Systems, *Natural Computing*, 2 (2003), 229–249.

4. The Decomposition of Linearly Ordered Pseudo-Hoops, *Soft Computing*, 21 (2017), 5631.

5. Cut-and-Paste Languages, Workshop on Formal languages and Automata (WFLA), *12th International Symposium on Fundamentals of Computation Theory,* FCT'99 Iaşi, Romania, August 30 – September 3, 1999, *Grammars,* 2, 3 (1999), 179–188.

6. (with D. Sburlan) Simulating Boolean Circuits with P Systems, *Membrane Computing: International Workshop*, WMC 2003, Tarragona, Spain (C. Martín-Vide, Gh. Păun, G. Rozenberg, A. Salomaa, eds.), *LNCS* 2933, Springer, 2004, 104–122.

7. Categories in the Study of Communication Processes and Meaning Generation, *Signs of Humanity, Proc. Fourth International Congress, International Association for Semiotic Studies*, Barcelone – Perpignan 1989, 03–03/06–04, edited by M. Balad, J. Delledale–Rhodes, general editor G. Delledale, Mouton DeGruyter, Berlin, New York, 1993, 181–186.

8. (with M.J. Pérez-Jiménez) On Simulating a Class of Parallel Architectures, *International Journal of Foundations of Computer Science*, 17, 1 (2006), 91–110.

9. (with C. Martín-Vide) P Systems with Communication for Static Sorting, *Preproc. 1st Brainstorming Week on Membrane Computing* (M. Cavaliere, C. Martín-Vide, Gh. Păun, eds.), GRLMC Report no 26, Rovira i Virgili University, Tarragona, 2003, 101–117.

10. (with K. G. Subramanian) Simple Circular H Systems, *Romanian Journal of Information Science and Technology*, 6, 1–2 (2003), 121–134.

Personal web page: http://fmi.unibuc.ro/ro/ceterchi_rodica/

CHIRA, Camelia

Born on May 16, 1976, in Mediaş, Romania.

Education: Bachelor in computer science, "Babeş-Bolyai" University Cluj-Napoca (1994–1998), Master in Science, Galway-Mayo Institute of Technology, Ireland (2000–2002).

PhD: Galway-Mayo Institute of Technology, Ireland, 2002–2005. Thesis title: *The Development of a Multi-Agent Design Information Management and Support System*. Scientific advisor: Thomas Roche.

Scholarships, postdoc stages: postdoc, "Babeş-Bolyai" University, supervisor: D. Dumitrescu (2005–2007).

Positions: Researcher grade III, "Babeş-Bolyai" University, 2007–2013.
Lecturer, Technical University of Cluj-Napoca, 2014–2017.
Associate Professor, "Babeş-Bolyai" University, 2018 – present.

Research areas: Artificial intelligence, evolutionary computing, swarm intelligence, complex networks.

Main results:
New hybrid algorithms for solving complex optimization problems.
Patent for a method and device to detect lateral cerebrovascular accidents.

Editorial boards: *International Journal of Applied Intelligence.*

Honors, prizes, scientific distinctions: Romanian Academy Award "Grigore C. Moisil", 2008.

Books:
1. *Multi-Agent Systems for Distributed Collaborative Design*, Casa Cărţii de Ştiinţă, Cluj-Napoca, 2007.
2. (with B. Iantovics, D. Dumitrescu) *Principiile Agenţilor Inteligenţi*, Casa Cărţii de Ştiinţă, Cluj-Napoca, 2007.

Representative articles:

1. (with J. Sedano, J.R. Villar, M. Camara, C. Prieto) Gene Clustering for Time-Series Microarray with Production Outputs, *Soft Computing*, 20, 11 (2016), 4301–4312.

2. (with A.L.C. Bazzan, R.J.F. Rossetti) Multi-Objective Evolutionary Traffic Assignment, *18th International Conference on Intelligent Transportation Systems*, IEEE, 2015, 1177–1182.

3. (with A. Andreica) Best-Order Crossover for Permutation-Based Evolutionary Algorithms, *Applied Intelligence*, 42, 4 (2015), 751–776.

4. (with J. Sedano, J.R. Villar, M. Camara, E. Corchado) Urban Bicycles Renting Systems: Modelling and Optimization Using Nature-Inspired Search Methods, *Neurocomputing*, 135 (2014), 98–106.

5. (with J. Sedano, M. Camara, C. Prieto, J.R.Villar, E. Corchado) A Cluster Merging Method for Time Series Microarray with Production Values, *International Journal Neural Systems,* 24, 6 (2014).

6. (with D. Iclanzan, A. Gog) Cell State Change Dynamics in Cellular Automata, *Memetic Computing*, 5, 2 (2013), 131–139.

7. (with A. Gog, D. Iclanzan) Evolutionary Detection of Community Structures in Complex Networks: A New Fitness Function, *IEEE Congress on Evolutionary Computation*, Brisbane, Australia, 2012, 1719–1726.

8. (with D. Horvath, D. Dumitrescu) Hill-Climbing Search and Diversification within an Evolutionary Approach to Protein Structure Prediction, *BioData Mining*, 4, 23 (2011).

9. A Hybrid Evolutionary Approach to Protein Structure Prediction with Lattice Models, *IEEE Congress on Evolutionary Computation*, IEEE, 2011, 2300–2306.

10. (with D. Dumitrescu, C.-M. Pintea) Learning Sensitive Stigmergic Agents for Solving Complex Problems, *Computing and Informatics,* 29, 3 (2010), 337–356.

Personal web page: http://cs.ubbcluj.ro/~cchira

CIOBANU, Gabriel

Born on July 5, 1957, in Piatra Neamţ, Romania.

Education: "Al.I. Cuza" University of Iaşi, Faculty of Mathematics, 1976–1981.

PhD: "Al.I. Cuza" University of Iaşi, 1994. Thesis title: *Algebraic Approaches to Semantics of Programming Language.* Scientific advisors: Viorel Barbu and Călin Ignat.

Scholarships, postdoc stages:
1991–1992: Royal Society London Research Fellow, Edinburgh University, UK.
1994: DAAD Fellowship, Inst. Computer Science, Univ. Kiel, Germany.
1995–1996: JSPS Researcher, Tohoku University, Japan.
2000–2004: Research Fellow, National University of Singapore.
2010–2015: Visiting Professor, Newcastle University, UK.

Positions:
1983–1990: Programmer and Researcher, "Al.I. Cuza" University Iaşi, Romania.
1991–2001: Assistant and then Associate Professor, "Al.I. Cuza" University.
2000–2004: Research Fellow, National University of Singapore.
2005–2008: Professor, "Al.I. Cuza" University of Iaşi, Romania.
2001–present: Senior Researcher, Romanian Academy (Iaşi branch).

Research areas and main results/contributions:
Foundations of mathematics and computer science (finitely supported mathematics):
– a new set theory in which any infinite structure has a finite support (expressed by permutation invariance);
– starting from the Fraenkel-Mostowski permutative model of Zermelo-Fraenkel set theory with atoms;
– connections to the logical notions of A. Tarski, Erlangen program of F. Klein, admissible sets, and Gandy machines;
– inconsistency of choice axiom and other choice principles in finitely supported mathematics.
Natural computing (membrane computing/P systems):
– introducing several systems of mobile membranes, emphasizing the power of endocytosis and exocytosis;

– distributed algorithms over P systems and links to evolutionary algorithms;

– causality and reversing computation in P systems and intensive parallel systems;

– defining the formal semantics of P systems and implementing membranes on clusters of computers;

– using membranes to describe various biological processes (e.g., the sodium-potassium pump, immune system).

Distributed systems (process calculi):

– semantics, behavioural equivalences, logics, verification;

– introducing and studying timed distributed pi-calculus and TiMo (timed mobility);

– mobile ambients with timers modelling network protocols and distributed systems;

– encoding mobile ambients into the pi-calculus and into membrane computing;

– faithful pi-nets for asynchronous pi-calculus and jc-nets; metric semantics with continuations for concurrency.

Bridging natural computing and process calculi:

– encoding both mobile ambients and brane calculi into mobile membranes;

– encoding mobile membranes into coloured Petri nets (and verifying various systems by using CPN tools);

– extending some notions from process calculi to P systems (e.g., behavioural equivalences).

Administrative positions: 2010–2013, member of the National Research Council (CNCS), Romania.

Editorial boards: *Scientific Annals of Computer Science of "Al.I. Cuza" University* (editor-in-chief, 2006–present), *Computer Science Journal of Moldova* (Chişinău).

Membership to professional organizations: Seminarul Matematic and Seminarul Matematic Foundation Iaşi, European Association for Theoretical Computer Science (EATCS), European Association for Programming Languages and Systems (EAPLS), European Molecular Computing Consortium (EMCC), International Society for Computational Biology (ISCB), American Mathematical Society (AMS).

Honors, prizes, scientific distinctions:

2000: "Grigore C. Moisil" Prize of the Romanian Academy.

2004: "Octav Mayer" Award for Scientific Achievements, Romanian Academy, Iaşi branch.

2013: "Grigore C. Moisil" Prize of the Romanian Academy (co-author of *Mobility in Process Calculi and Natural Computing*, Springer).

2017: elected member of the Academia Europaea (Academy of Europe).

PhD students: Mihai Rotaru (2002), Bogdan Aman, (2009), Cosmin Bonchiş (2009), Cornel Izbaşa (2010), Oana Agrigoroaiei (2012), Andrei Alexandru (2012), Armand Rotaru (2014), Cristian Văideanu (2014).

Books:

1. (with Gh. Păun, eds.) *Fundamentals of Computation Theory*, Springer, Berlin, 1999.
2. (with G. Rozenberg, eds.) *Modelling in Molecular Biology*, Natural Computing Series, Springer, Berlin, 2004.
3. (with Gh. Păun, M.J. Pérez-Jiménez, eds.) *Applications of Membrane Computing*, Natural Computing Series, Springer, Berlin, 2006.
4. (with B. Aman) *Mobility in Process Calculi and Natural Computing*, Natural Computing Series, Springer, Berlin, 2011.
5. (with A. Alexandru) *Finitely Supported Mathematics. An Introduction,* Springer, Berlin, 2016.

Representative articles:

1. (with L. Pan, Gh. Păun, M.J. Pérez-Jiménez) P Systems with Minimal Parallelism, *Theoretical Computer Science*, 378 (2007), 117–130.
2. (with O. Andrei, D. Lucanu) A Rewriting Logic Framework for Operational Semantics of Membrane Systems, *Theor. Comp. Sci*., 373 (2007), 163–181.
3. (with S.N. Krishna) Enhanced Mobile Membranes: Computability Results, *Theory of Computing Systems*, 48 (2011), 715–729.
4. (with C. Juravle) Flexible Software Architecture and Language for Mobile Agents, *Concurrency and Computation: Practice and Experience*, 24 (2012), 559–571.
5. General Patterns of Interaction in Stochastic Fusion, *Natural Computing*, 12, 3 (2013), 429–439.
6. (with O. Agrigoroaiei) Rewriting Systems Over Indexed Multisets, *Computer Journal*, 57, 1 (2014), 165–179.
7. (with A. Alexandru) Nominal Groups and Their Homomorphism Theorems, *Fundam. Inform*., 131 (2014), 279–298.
8. (with G.M. Pinna) Catalytic and Communicating Petri Nets are Turing Complete, *Information and Computation*, 239 (2014), 55–70.
9. (with M. Koutny) PerTiMo: A Model of Spatial Migration with Safe Access Permissions, *Computer Journal*, 58, 5 (2015), 1041–1060.
10. (with R. Horne, V. Sassone) A Descriptive Type Foundation for RDF Schema, *J. Log. Algebr. Meth. Program*., 85, 5 (2016), 681–706.

Further information:

Overall: 5 books as (co)author, 8 volumes as (co)editor, several special issues of various journals, more than 250 papers published in English (and some other papers published in Romanian).

According to Scholar Google, the number of citations is over 2450, with h-index 22 (Feb. 2018). According to SCOPUS, the number of citations is over 1030, with h-index 14 (Feb. 2018).

Teaching and doing research in several universities around the world.

Short visits and talks given at universities from UK, Japan, Germany, France, Holland, Spain, Italy, Canada, Taiwan, Singapore, Cyprus, etc.

Invited speaker at some international conferences in Europe, Asia and North America.

Useful links:

https://scholar.google.ro/scholar?as_vis=1&q=Gabriel+Ciobanu+autor:Ciobanu&hl=ro&as_sdt=1,5

https://www.scopus.com/authid/detail.uri?authorId=7003872401

https://www.researchgate.net/profile/Gabriel_Ciobanu

http://dblp.org/search/index.php?query=author:Gabriel_Ciobanu:

Personal web page: http://www.info.uaic.ro/~gabriel

COJOCARU, Svetlana

Born on July 26, 1952, in Butuceni, Râbnița, Republic of Moldova.

Education:

State University of Moldova, Faculty of Mathematics and Computer Science, 1969–1974;

Postgraduate studies, Institute of Mathematics and Computer Science of Academy of Sciences of Moldova (1976–1980).

PhD in computer science, Institute of Cybernetics, National Academy of Sciences, Kiev, Ukraine, 1982. Thesis title: *Study of Scattered Context Grammars and Their Application in Compilers Construction.* Scientific advisors: Eduard Trakhtengerts (Institute of Control Science, Russian Academy of Sciences, Moscow) and Mihail Gonta (Institute of Mathematics and Computer Science of the Academy of Sciences of Moldova).

Doctor in Habilitation in computer science, Institute of Mathematics and Computer Science of Academy of Sciences of Moldova, 2007, with the thesis *Intelligent Interfaces for Computer Algebra Systems*.

Positions:

Programmer (1974–1984), Senior Programmer (1978–1984), Researcher (1984–1999), Scientific Secretary (1999–2006), Deputy Director (2006–2010), Director (2010–present), at the Institute of Mathematics and Computer Science of the Academy of Sciences of Moldova, Chişinău.

Research areas: Formal grammars and languages, natural language processing, computer algebra, membrane computing.

Main results:

A new class of scattered context grammars, oriented to parallel processing, has been proposed. Its equivalence to context-dependent grammars was proved.

A grammar of flexion was defined, on the basis of which the problem of automatic flexion for inflexional natural languages was solved. A corresponding grammar for Romanian language was developed and used for automatic generation of a computational lexicon of about one million words, which served to elaborate several applications for Romanian.

The intelligent interface architecture for the computer algebra system Bergman has been proposed. Computational capabilities of the Bergman system have been extended, especially for non-commutative rings.

Interfaces for computer applications in medicine (neurology, ultrasonography) have been designed.

There were proposed algorithms for efficient solutions to some complex computational problems (NP-complete) in the field of symbolic calculus and natural language processing, based on membrane computing.

Editorial boards: *Computer Science Journal of Moldova* (deputy editor in chief); *BRAIN. Broad Research in Artificial Intelligence and Neuroscience; Revista Română de Automatică; Bulletin of the International Membrane Computing Society.*

Guest editor of the international journal *Fundamenta Informaticae* (IOS Press) and *Revista de inventică: Romanian Journal for Creativity in Engineering and Technology* (Iaşi).

Membership to professional organizations: Vice-president of the Mathematical Society of the Republic of Moldova.

Honors, prizes, scientific distinctions:

Prize of the Institute of Mathematics and Computer Science ASM for the best scientific papers – 2003, 2007.

Diploma of Honor of Presidium of Academy of Sciences of Moldova – 2002, 2004, 2012.

National Prize of the Republic of Moldova, 2011.

Academician Constantin Sibirschi Award, 2015.

Medal "70th anniversary of the creation of the first research institutions that founded the Academy of Sciences of Moldova", 2016.

Corresponding Member of the Academy of Sciences of Moldova, 2017.

Medal "Nicolae Milescu Spătaru", 2018.

PhD students: Alexandru Colesnicov (1996), Oleg Burlaca (2006, co-adviser Constantin Gaindric), Mircea Petic (2011), Neculai Curteanu (2013), Veaceslav Albu (2016), Vladimir Popukaylo (2017).

Books:

1. (with M. Evstiunin, V. Ufnarovski) *How Pascal and Oberon Are Appearing on SAMSON or the Art of Compilers Construction*, Chişinău, Ştiinţa, 1991 (304 pages, in Russian).
2. (with C. Gaindric) *Considerations on the Building of the Information Society in Moldova*, Chişinău, I.M.I., 2003 (95 pages, in Romanian).
3. (with J. Backelin, V. Ufnarovski) *Mathematical Computations Using Bergman*, Lund University, Sweden, 2005 (206 pages).

4. (with G. Pfister, V. Ufnarovski, eds.) *Computational Commutative and Non-Commutative Algebraic Geometry*, NATO Science Series III: Computer and Systems Sciences – vol. 196, IOS Press, 2005 (325 pages).

5. (with A. Alhazov, M. Gheorghe, Yu. Rogozhin, G. Rozenberg, A. Salomaa, eds.) *Membrane Computing, 14th International Conference*, CMC 2013, Chişinău, Republic of Moldova, August 20–23, 2013, *Revised Selected Papers, LNCS* 8340, Springer, Berlin, 2014.

Representative articles:

1. (with A. Podoplelov, V. Ufnarovski) Non-Commutative Gröbner Bases and Anick's Resolution, in *Progress in Mathematics*, vol. 173, Chapter 7, Birkhäuser, 1999, 139–159.

2. (with A. Colesnicov, L. Malahova) Providing Modern Software Environments to Computer Algebra Systems, *Computer Algebra in Scientific Computing, LNCS* 4194, Springer, 2006, 129–140.

3. Computational Environment Generation for Computer Algebra Systems, *Studies in Informatics and Control*, 17, 2 (2008), 231–236.

4. (with A. Alhazov, L. Malahova, Yu. Rogozhin) Dictionary Search and Update by P Systems with String-Objects and Active Membranes, *International Journal of Computers, Communications and Control*, 4, 3 (2009), 206–213.

5. (with A. Alhazov, L. Burtseva, Yu. Rogozhin) Solving PP-Complete and #P-Complete Problems by P Systems with Active Membranes, in D.W. Corne, P. Frisco, Gh. Păun, G. Rozenberg, A. Salomaa, eds., *Membrane Computing – 9th International Workshop*, WMC 2008, Edinburgh, *Revised Selected and Invited Papers, LNCS* 5391, Springer, 2009, 108–117.

6. (with A. Alhazov, E. Boian, A. Colesnicov, L. Malahov, M. Petic, Yu. Rogozhin) A P System Parsing Word Derivatives, in G. Mauri, A. Dennunzio, L. Manzoni, A.E. Porreca, eds., *Unconventional Computation and Natural Computation*, *LNCS* 7956, Springer, 2013, 246–247.

7. (with A. Alhazov, A. Colesnicov, L. Malahov, M. Petic) A P System for Annotation of Romanian Affixes, in A. Alhazov, S. Cojocaru, M. Gheorghe, Yu. Rogozhin, G. Rozenberg, A. Salomaa, eds., *Membrane Computing, LNCS* 8340, Springer, 2014, 80–87.

8. (with A. Alhazov) Small Asynchronous P Systems with Inhibitors Defining Non-Semilinear Sets, *Theoretical Computer Science*, 701 (2017), 12–19.

Further information:

Co-director of 9 international research projects, coordinator of 2 bilateral international projects (Romania & Republic of Moldova, Ukraine & Republic of Moldova), coordinator of 8 national projects.

Personal web page: http://www.math.md/en/people/cojocaru–svetlana

CURTICĂPEAN, Radu Cristian

Born on June 4, 1990, in Lugoj, Romania.

Education: BSc and MSc at Saarland University, Germany (2007–2011).
High school in Offenburg and Saarbrücken, Germany (2000–2007).

PhD: Saarland University, Germany (2011–2015). Thesis title: *The Simple, Little and Slow Things Count: On Parameterized Counting Complexity.* Scientific advisor: Markus Bläser.

Scholarships, postdoc stages:
March 2018: Postdoctoral researcher at Basic Algorithms Research Copenhagen (BARC) and IT-University Copenhagen, Denmark.
May 2015 – January 2018: Postdoctoral researcher at the Institute for Computer Science and Control of the Hungarian Academy of Sciences (MTA SZTAKI), Budapest, Hungary.
August 2015 – May 2016: Research fellow at the Simons Institute for the Theory of Computing, Berkeley, USA.
February 2011 – April 2015: Research assistant at Saarland University, Saarbrücken, Germany.
2009–2011: Scholarship by Graduate School for Computer Science Saarbrücken, Germany.
2008–2009: Scholarship by German National Merit Foundation.

Positions: only the postdoc positions listed above.

Research areas: Computational complexity of combinatorial counting problems, parameterized and fine-grained complexity.

Main results:
Complexity classification for counting small patterns in graphs (parts done with Markus Bläser, Dániel Marx, and Holger Dell).
Faster algorithms for counting small patterns like paths and matchings in graphs (parts done with Dániel Marx and Holger Dell).
Results on the complexity of the permanent under structural parameterizations like treewidth, genus, apex number, Hadwiger number (parts done with Dániel Marx and Mingji Xia).

Membership to professional organizations: EATCS (European Association for Theoretical Computer Science).

Honors, prizes, scientific distinctions:

Best Paper Award for joint work with Fedor Fomin, Holger Dell, Leslie Goldberg, and John Lapinskas at the *12th International Symposium on Parameterized and Exact Computation* (*IPEC* 2017).

Distinguished Dissertation Award 2016 from the European Association for Theoretical Computer Science (EATCS).

Dr. Eduard-Martin-Preis 2016, for best dissertation in computer science in the respective period at Saarland University.

GI-Dissertations-Preis 2015 from the German, Austrian, and Swiss associations for computer science.

Best Student Paper Award at *42nd International Colloquium on Automata, Languages and Programming* (*ICALP* 2015).

Best Student Paper Award for joint work with Marvin Künnemann at *21st European Symposium on Algorithms* (*ESA* 2013).

Best Student Paper Award at *40th International Colloquium on Automata, Languages and Programming* (*ICALP* 2013).

Representative articles:

1. (with N. Lindzey, J. Nederlof) A Tight Lower Bound for Counting Hamiltonian Cycles via Matrix Rank, *SODA* 2018, 1080–1099.
2. (with I. Bezáková, H. Dell, F.V. Fomin) Finding Detours Is Fixed-Parameter Tractable, *ICALP* 2017, 54:1–54:14.
3. (with H. Dell, D. Marx) Homomorphisms Are a Good Basis for Counting Small Subgraphs, *STOC* 2017, 210–223.
4. (with D. Marx) Tight Conditional Lower Bounds for Counting Perfect Matchings on Graphs of Bounded Treewidth, Cliquewidth, and Genus, *SODA* 2016, 1650–1669.
5. (with M. Xia) Parameterizing the Permanent: Genus, Apices, Minors, Evaluation Mod 2^k, *FOCS* 2015, 994–1009.
6. Block Interpolation: A Framework for Tight Exponential-Time Counting Complexity, *ICALP* (1) 2015, 380–392.
7. (with D. Marx) Complexity of Counting Subgraphs: Only the Boundedness of the Vertex-Cover Number Counts, *FOCS* 2014, 130–139.
8. Counting Matchings of Size k Is $W[1]$-Hard, *ICALP* (1) 2013, 352–363.

Further information:

I was born in Lugoj in 1990 and emigrated to Germany in 1993. I spent most of my childhood and youth in Germany, but I still keep regular contact with the parts of my family that live in Romania.

Personal web page: https://www-cc.cs.uni-saarland.de/curticapean/

CZEIZLER, Eugen

Born on August 28, 1979, in Bucureşti, Romania.

Education: Undergraduate studies in computer science, University of Bucharest, Romania, 1998–2002.

PhD in mathematics, University of Turku, Finland, 2002–2007. Thesis title: *The Inverse Neighborhood Problem and Applications of Welch Sets in Automata Theory*. Scientific advisor: Jarkko Kari

Positions:

2007–2008: Postdoctoral Fellow, Department of Computer Science, University of Western Ontario, London, Canada.

2008–2010: Postdoctoral researcher, Department of Information Technologies, Åbo Akademi University, Turku, Finland.

2010–2015: Postdoctoral researcher, Department of Computer Science, Aalto University, Espoo, Finland.

2015–present: Senior researcher, Department of Computer Science, Åbo Akademi University, Turku, Finland.

2016–present: Scientific researcher I and project director, National Institute of Research and Development for Biological Sciences, Bucharest, Romania.

Research areas: Computational modelling, mathematical bio-medicine, combinatorial algorithms, optimization, and complexity, data analytics and network science, DNA algorithmic nanotechnology, nature-inspired computing.

Main results:

Using the theory of network control and the recent discovery of disease-specific essential genes, we are identifying new multi-drug therapy candidates, which are mathematically proven to have an effect over disease down-proliferation (paper [2] below). In particular, we identify specific multi-drug therapies which are giving "control" (the ability to change these configurations) over the "essential nodes" within disease- and patient-specific molecular interaction networks (paper [1]).

We introduced a general method of folding arbitrary polygonal digital meshes in DNA that readily produces structures that would be very difficult to realize using previous approaches. The design process is highly automated, using a routing algorithm based on graph theory and a relaxation simulation that traces

scaffold strands through the target structures. At a general level, the resulting technique can be described as "nanoscale 3D printing" with DNA (paper [3]).

We wrote the only existing survey manuscript of the topic of Watson-Crick automata. The survey concentrates on the computational power, complexity measures, decidability problems, and systems of Watson-Crick automata working together on the same input (paper [9]).

We proved a long standing conjecture in the field of cellular automata, namely regarding the size of the inverse neighborhood of a 1-dimenssional reversible cellular automaton (RCA). Thus, we showed that in a RCA with n states, the inverse neighborhood is not wider than $n-1$, when the neighborhood in the forward direction consists of two consecutive cells. Examples are known where range $n-1$ is needed, so the bound is tight. If the forward neighborhood consists of m consecutive cells then the same technique provides the upper bound $nm-1-1$ for the inverse direction (paper [10]).

Administrative positions:

(2003–2006) Student member in the board of the Turku Centre for Computer Science.

(2016–2020) Project director of Modelling Design and Analysis of Self–assembly Synthetic Systems, National Institute of Research and Development for Biological Sciences, Bucharest, Romania.

Honors, prizes, scientific distinctions:

Best paper award at the *14th International Conference on Computational Methods in Systems Biology,* Cambridge, UK, 2016.

TNANO – Article in focus; October 2015 (together with P. Orponen), IEEE Transactions on Nanotechnology, 2015.

Best paper award at the *9th International Conference on Computational Methods in Systems Biology,* Paris, France, 2011.

The PhD thesis was approved "with honours", i.e., it was ranked within the top 5–10% of this research field worldwide, 2007.

PhD students: Victor Popescu (started 2017).

Representative articles:

1. (with C. Gratie, K.-C. Wu, K. Kanhaiya, I. Petre) Target Controllability of Linear Networks, *IEEE/ACM Trans. in Computational Biology and Bioinformatics*, 2018. A preliminary version has appeared in *Proc. 14th International Conference on Computational Methods in Systems Biology* (*CMSB* 2016), *LNBI* 9859, Springer, 2016. The paper received the NVIDIA Best Paper Award (CMSB 2016).

2. (with K. Kanhaiya, C. Gratie, I. Petre) Controlling Directed Protein Interaction Networks in Cancer, *Scientific Reports* 7 (10327), Nature Publishing Group, 2017.

3. (with E. Benson, A. Mohammed, J. Gardell, S. Masich, P. Orponen, B. Hogberg) DNA Rendering of Polyhedral Meshes at the Nanoscale, *Nature*, 523 (2015), 441–444.

4. (with P. Orponen) Fault Tolerant Design and Analysis of Carbon Nanotube Circuits Affixed on DNA Origami Tiles, *IEEE Transactions on Nanotechnology*, 14, 5 (2015), 1–17. The paper is featured as "TNANO–Article in focus, October 2015" on the journal's webpage.

5. (with M. Göös, T. Lempiainen, P. Orponen) Search Methods for Tile Sets in Patterned DNA Self-Assembly, *Journal of Computer and System Sciences*, 80 (2014), 297–319.

6. (with Al. Popa) Synthesizing Minimal Tile Sets for Complex Patterns in the Framework of Patterned DNA Self-Assembly, *Theoretical Computer Science*, 499 (2013), 23–37.

7. (with B. Iancu, E. Czeizler, I. Petre) Quantitative Refinement of Reaction Models, *International Journal of Unconventional Computing*, 8 (2012), 529–550.

8. (with E. Czeizler, L. Kari, S. Seki) An Extension of the Lyndon Schützenberger Result to Pseudoperiodic Words, *Proc. 13th International Conference on Developments in Language Theory* (*DLT* 2009), *LNCS* 5583, Springer, 2009, and *Information and Computation*, 209, 4 (2011), 717–730.

9. (with E. Czeizler) A Short Survey on Watson-Crick Automata, *Bulletin of the EATCS*, 88 (2016),104–119.

10. (with J. Kari) A Tight Linear Bound on the Neighborhood of Inverse Cellular Automata, *Proc. 32nd International Colloquium on Automata, Languages and Programming* (ICALP 2005), *LNCS* 3580, Springer, 2005.

CZIBULA, Gabriela (maiden name: Şerban)

Born on April 30, 1969, in Mediaş, Romania.

Education: Bachelor of Science degree in computer science, Faculty of Mathematics and Computer Science, Computer Science specialization, "Babeş-Bolyai" University, Cluj-Napoca (1987–1992).

PhD: "Babeş-Bolyai" University, 2003. Thesis title: *Development Methods for Intelligent Systems.* Scientific advisor: Militon Frențiu.

Scholarships, postdoc stages:

CEEPUS Mobility Grant H–81, Technical University of Szeged, Hungary, June 1999.

TEMPUS S–JEP 12518–97 Mobility Grant, National Technical University of Athens, Greece, November–December 2000.

CEEPUS Mobility Grant H–81, Faculty of Sciences, Kosice, Slovakia, June 2002.

CEEPUS Mobility Grant H–81, "Eötvös Loránd" University, Budapest, Hngary, June 2003.

Positions:

Teaching Assistant (1998–2002), Lecturer (2002, 2005), Associate Professor (2005–2009), Professor (since 2009), Department of Computer Science, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University of Cluj-Napoca.

January 1998–September 1998: Project manager at S.C. "Sport Ancada Prodimpex", Cluj-Napoca.

September 1992 – January 1998: Professor of computer science at "National Gas School", Mediaş.

Research areas: Computational intelligence (data mining, machine learning, multiagent systems), search-based software engineering.

Main results: theoretical and algorithmic contributions to machine learning (adaptive and dynamic clustering, relational association rule mining, adaptive relational association rule mining, hybrid models) as well as interdisciplinary applications of machine learning in domains like: software engineering (refactorings identification,

software defect prediction, design patterns detection, etc.), bioinformatics (protein analysis, protein folding, DNA analysis, sequence alignment), bioarchaeology (gender, age and body mass prediction) and natural language processing (word sense disambiguation, question answering, textual entailment).

Administrative positions:

Since 2017: Head of the Doctoral School in Mathematics and Computer Science, Faculty of Mathematics and Computer Science, Computer Science specialization, "Babeş-Bolyai" University, Cluj-Napoca.

Editorial boards: Since 2017, executive editor, *Studia Universitatis "Babeş-Bolyai", Informatica.*

Membership to professional organizations: Since 2014, member in the Computer Science commission of CNATDCU.

Honors, prizes, scientific distinctions:

Certificate of merit for contribution to "Babeş-Bolyai" University development, 2006.

Award for books published in 2006, "Babeş-Bolyai" University, 2007.

The "Professor of the Year" award, "Babeş-Bolyai" University, 2010.

Award for scientific excellence, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University, 2012.

PhD students: Maria-Iuliana Bocicor (2010–2013), Zsuzsanna-Edit Marian (2011–2014), Adela Rus (2012–2015, co-supervisor Insa Rouen, France), Ioan-Gabriel Mircea (2013–2016), Vlad-Sebastian Ionescu (2014–2017), Silvana Albert (since 2016), Csaba Sulyok (since 2016), Diana-Lucia Miholca (since 2017), Liana Crivei (since 2017).

Books:

1. *Sisteme multiagent în inteligența artificială distribuită. Arhitecturi şi aplicații*, Ed. RisoPrint, Cluj-Napoca, 2006.
2. (with M. Frențiu, H.F. Pop) *Programming Fundamentals*, Ed. Presa Universitară Clujeană, Cluj-Napoca, 2006,.
3. *Sisteme inteligente. Instruire automată*, Ed. RisoPrint, Cluj-Napoca, 2008.
4. (with V. Niculescu) *Structuri fundamentale de date şi algoritmi. O perspectivă orientată obiect*, Ed. Casa Cărții de Ştiință, 2011 (230 pages).
5. (with H.F. Pop) *Elemente avansate de programare în Lisp şi Prolog. Aplicații în inteligența artificială*, Ed. Albastră, Cluj-Napoca, 2012.

Representative articles:

1. (with A. Câmpan) Adaptive Clustering Algorithms, *Proc. 19th Canadian Conference on Artificial Intelligence*, Canadian AI–2006, Quebec, Canada, 2006, in *Advances in Artificial Intelligence*, LNAI 4013, Springer, 2006, 409–420.
2. (with A. Câmpan) Hierarchical Adaptive Clustering, *Informatica*, 19, 1 (2008), 101–112.
3. (with M.I. Bocicor, I.G. Czibula) Promoter Sequences Prediction Using Relational Association Rule Mining*, Evolutionary Bioinformatics*, 8 (2012), 181–196.
4. (with I.G. Czibula, R.D. Găceanu) Intelligent Data Structures Selection using Neural Networks, *Knowledge and Information Systems*, 34, 1 (2013), 171–192.
5. (with M.I. Bocicor, I.G. Czibula) Temporal Ordering of Cancer Microarray Data Through a Reinforcement Learning Based Approach, *PloS One journal*, 8(4): e60883, 2013.
6. (with Z. Marian, I.G. Czibula) Software Defect Prediction Using Relational Association Rule Mining, *Information Sciences*, 264 (2014), 260–278.
7. (with I.G. Czibula, R.D. Găceanu) A Support Vector Machine Model For Intelligent Selection of Data Representations, *Applied Soft Computing*, 18 (2014), 70–81.
8. (with I.G. Czibula, A. Sârbu, I.-G. Mircea) A Novel Approach to Adaptive Relational Association Rule Mining, *Applied Soft Computing journal*, 36 (2015), 519–533.
9. (with V.-S. Ionescu, D.-L. Miholca, I.-G. Mircea) Machine Learning Based Approaches for Predicting Stature of Archaeological Skeletal Remains from Long Bone Lengths, *Journal of Archaeological Science*, 65 (2016), 85–99.
10. (with D.-L. Miholca, I.G. Czibula) A Novel Approach for Software Defect Prediction Through Hybridizing Gradual Relational Association Rules with Artificial Neural Networks, *Information Sciences*, 441 (2018), 152–170.

Further information: 170 research papers: 66 ISI publications (31 in ISI journals and 35 at ISI conferences), 90 indexed publications (INSPEC, ACM, DBLP, Mathematical Reviews), 14 publications which are not indexed.

Principal investigator in 2 national research projects and 1 international research project (Bilateral cooperation Romania-France, mobilities project), scientific executive in 1 national research project, member in 6 other national research projects and 1 international project.

Personal web page: https://www.cs.ubbcluj.ro/~gabis

CZIBULA, István-Gergely

Born on May 5, 1980, in Carei, Romania.

Education: BSc in Computer Science, Faculty of Mathematics and Computer Science, Computer Science specialization, "Babeş-Bolyai" University, Cluj-Napoca (1998–2002).

Master in Computer Science, Faculty of Mathematics and Computer Science, Computer Science specialization, "Babeş-Bolyai" University, Cluj-Napoca (2002–2003).

PhD: "Babeş–Bolyai" University, 2010. Thesis title: *Use of Search Techniques to Software Development.* Scientific advisor: Bazil Pârv.

Scholarships, postdoc stages: Visting researcher, Wayne State Universty, June 2008.

Positions:

Teching assistant (2009–2011), Lecturer (2011–2014), Associate Professor (2014–2017), Professor (since 2017), Department of Computer Science, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University, Cluj-Napoca.

Since 2002: Software developer at S.C. "Infoworld" S.R.L, Cluj-Napoca.

Research areas: Search-based software engineering, software engineering, object oriented modelling and design, machine learning.

Main results:

The main theoretical and practical research results are the field of machine learning (concurrent and adaptive relational association rule mining) and in the search-based software engineering field, in applying machine learning models and techniques in software engineering (program comprehension, software restructuring, design defect detection, software defect prediction, software testing, aspect mining, behavioral adaptation of software systems, hidden dependencies identification, impact analysis, etc.). In the software engineering field, other relevant results are: a methodology for agile software development based on executable models, rapid prototyping, component based and service oriented development using platform independent UML models, software frameworks.

Honors, prizes, scientific distinctions:
Award for the best PhD thesis, CNCSIS, 2009.
Award for didactic activity, 2014, "Babeş-Bolyai" University, Cluj-Napoca.
Award for scientific research, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University, 2015.

PhD students: Robert-Francisc Vida (since 2017).

Books:
1. *Use of Search Techniques to Software Development*, Editura Risoprint, Cluj-Napoca, 2009.

Representative articles:
1. (with G. Şerban) A New Clustering Approach for Systems Designs Improvement, *2007 International Conference on Software Engineering Theory and Practice*, SETP–07, Orlando, USA, July 9–12, 2007, 47–54.
2. (with L.C. Lazăr, I. Lazăr, S. Motogna, B. Pârv) ComDeValCo Development Tools for Procedural Paradigm, *International Journal of Computers, Communications and Control*, vol. 3, *Proc. International Conference on Computers, Communications and Control*, ICCCC 2008, Oradea, 2008, 243–247.
3. (with S. Motogna, I. Lazăr, B. Pârv) An Agile MDA Approach for Service Oriented Components, *Proc. 6th International Workshop on Formal Engineering Approaches to Software Components and Architectures*, FESCA–ETAPS '2009, in *Electronic Notes in Theoretical Computer Science*, 253 (2009), 95–110.
4. (with G. Czibula, G.S. Cojocar) Hierarchical Clustering for Identifying Crosscutting Concerns in Object Oriented Software Systems, *INFOCOMP Journal of Computer Science*, 8, 3 (2009), 21–28.
5. (with G. Czibula) Software Systems Performance Improvement by Intelligent Data Structures Customization, *Information Sciences*, 274 (2014), 249–260.
6. (with G. Czibula, R.D. Găceanu) A Support Vector Machine Model For Intelligent Selection of Data Representations, *Applied Soft Computing*, 18 (2014), 70–81.
7. (with G. Czibula, Zs. Marian) Detecting Software Design Defects Using Relational Association Rule Mining, *Knowledge and Information Systems*, 42, 3 (2015), 545–577.
8. (with G. Czibula, Zs. Marian, V.-S. Ionescu) A Novel Approach Using Fuzzy Self-Organizing Maps for Detecting Software Faults, *Studies in Informatics and Control*, 25, 2 (2016), 207–216.
9. (with G. Czibula, Zs. Marian) An Improved Approach for Class Test Ordering Optimization Using Genetic Algorithms, *ICSOFT, International Conference on Software Technologies*, 2017, 27–37.
10. (with G. Czibula, Zs. Marian) An Effective Approach for Determining the Class Integration Test Order Using Reinforcement Learning, *Applied Soft Computing*, 65 (2018), 517–530.

Further information:

93 research papers: 50 ISI publications (23 in ISI journals and 27 at ISI conferences), 41 indexed publications (INSPEC, ACM, DBLP, Mathematical Reviews), 2 publications which are not indexed.

Principal investigator in 2 national research projects, scientific executive in 1 national research project and member in other 2 national projects and 2 international projects.

Personal web page: https://www.cs.ubbcluj.ro/~istvanc

DIACONESCU, Răzvan

Born on March 19, 1964, in Ploieşti, Romania.

Education: Faculty of Mathematics, University of Bucharest (1983–1987), Algebra and Informatics, 1987–1988.

PhD: Oxford, UK, 1994. Thesis title: *Category-Based Semantics for Equational and Constraint Logic Programming.* Scientific advisor: Joseph A. Goguen.

Scholarships, postdoc stages:

J. William Fulbright Award under Mutual Educational Exchange Program (1996).

US National Research Council Resident Research Associateship Award (1995).

Positions:

Researcher (1990–1995), Research Assistant Professor (CS3; 1995–1997), Research Associate Professor (CS2; 1997–2001), Research Professor (CS1; since 2001), at Institute of Mathematics of the Romanian Academy (IMAR), Bucharest.

Panasonic–Fujitsu–USAC Endowed Chair & Associate at JAIST, 1996–1999.

Visiting researcher at the Naval Postgraduate School, Monterey, CA, September 1994.

Research areas: Formal specification and verification (for system engineering), applications of logic and category theory to computer science, model theory, integrated children education in math and computer science.

Main results:

Design of the new specification and verification language CafeOBJ at Japan Advanced Institute for Science and Technology. The project was financed on a large scale by the Japanese Government. Besides the language itself, many fundamental ideas that have been developed during the process of designing CafeOBJ, have strongly influenced other developments worldwide.

Advancing model theory methods in computer science, especially in the areas of formal methods and artificial intelligence. An important side effect was a new revolutionary form of model theory, known as institution-independent model theory (the authoritative monograph of the area was published with this name), that had a strong impact in the context of the modern universal logic trend.

Administrative positions:

Head of IMAR Department of Number Theory and Computational Methods, since 2015.

Scientific Council of IMAR (since 2012).

Scientific Council of "Şcoala Normală Superioară" Bucharest (since 2002).

Head of the CNATDCU Commission for Informatics (since 2017).

Bureau of the CNATDCU Commission for Informatics (2011–2012).

Head of the CNATDCU Contestation Commission for Informatics (2012–2016).

AdAstra representative in the selection Committee for the CNATDCU Commission for Informatics (2016).

Editorial boards: *Studies in Universal Logic* book series at Springer Basel (formerly Birkhäuser), Switzerland (since 2007).

Honors, prizes, scientific distinctions:

Birkhäuser Award for the winner of the contest "How to translate a logic into another one?" of the *2nd World Congress of Universal Logic* (joint work with T. Mossakowski and A. Tarlecki) (2007).

"Grigore C. Moisil" Prize (for 2002) of the Romanian Academy (2004).

Winner of the Romanian National Mathematical Olympiad (1979).

PhD students: Alexander Madeira (2010–2013).

Books:

1. *Institution-Independent Model Theory,* volume of Studies in Universal Logic series, Birkhäuser, Basel, 2008 (386 pages).

2. (with K. Futatsugi) *CafeOBJ Report: the Language, Proof Techniques, and Methodologies for Object-Oriented Algebraic Specification*, vol. 6 of AMAST Series in Computing, World Scientific, Singapore, 1998 (174 pages).

Representative articles:

1. (with J.A. Goguen, P. Stefaneas) Logical Support for Modularisation, *Logical Environments*, 253 (1993).

2. (with J.A. Goguen) Towards an Algebraic Semantics for the Object Paradigm, *Recent Trends in Data Type Specification*, 224 (1994), 1–29.

3. (with K. Futatsugi) Behavioural Coherence in Object-Oriented Algebraic Specification, *Journal of Universal Computer Science*, 6, 1 (2000), 74–96.

4. (with J.A. Goguen) An Oxford Survey of Order Sorted Algebra, *Mathematical Structures in Computer Science*, 4, 3 (1994), 363–392.

5. (with K. Futatsugi) Logical Foundations of CafeOBJ, *Theoretical Computer Science*, 285, 2 (2002), 289–318.

6. Grothendieck Institutions, *Applied Categorical Structures*, 10, 4 (2002), 383–402.

7. (with R.M. Burstall) Hiding and Behaviour: An Institutional Approach, *A Classical Mind: Essays in Honour of C.A.R. Hoare*, 1994, 75–92.

8. (with T. Mossakowski, J.A. Goguen, A. Tarlecki) What is a Logic?, *Logica universalis*, 2007, 111–133.

9. Institution-Independent Ultraproducts, *Fundamenta Informaticae*, 55, 3–4 (2003), 321–348.

10. Extra Theory Morphisms for Institutions: Logical Semantics for Multi-Paradigm Languages, *Applied Categorical Structures*, 6, 4 (1998), 427–453.

Personal web page: rdiaconescu.weebly.com

DINU, Petrişor Liviu

Born on May 18, 1970, in Slatina, Olt county, Romania.

Education: University of Bucharest, Faculty of Mathematics and Computer Science, Computer Science Department: bachelor (1994), master (1996).

PhD: University of Bucharest, 2003. Thesis title: *Quantitative Aspects of Languages.* Scientific advisor: Solomon Marcus.

Scholarships, postdoc stages:
University of Trieste, CNR scholarship (2001, 1 month).
University of Trieste, Advanced NATO fellowship: CNR–NATO ASI grant (2005, 6 months).

Positions:
Assistant Professor (2001–2004), Lecturer (2004–2008), Associate Professor (2008–2014), Professor (2014–present), University of Bucharest, Faculty of Mathematics and Computer Science, Computer Science Department.
Institute for Microtechnology: Research Assistant (1994–1998).

Research areas: Computational linguistics, natural language processing, human language technologies, information processing, classification and similarity problems.

Administrative positions:
Director, Human Language Technologies Research Center (University of Bucharest).

Honors, prizes, scientific distinctions:
"Grigore C. Moisil" Prize of the Romanian Academy, 2007 (for 2005).
In Hoc Signo Vinces Prize (*Magna Cum Laude*), for research and publications awarded by the National Research Council for Higher Education, Romania, 2005.

PhD students: Alina Ciobanu (2014–2018), Maria Sulea (2014–2018), Sergiu Nisioi (2015–2019), Ana Uban (2015–2019), Laura Franzoi (2015–2019), Andrei Butnaru (2016–2020), Ioana Vlad (2016–2021), Cristina Moise (2017–2021), Bogdan Dumitru (2017–2021).

Books:

1. *Metode formale şi de clasificare în lingvistica matematică şi computațională*, Editura Universității din Bucureşti, 2004.

2. *Rank Distance and Applications*, Editura Universității din Bucureşti, 2010.

Representative articles:

1. (with A. Ciobanu, A. Sgarro) Towards a Map of the Syntactic Similarity of Languages, *Proc. CICLing 2017*, Budapest, Hungary, 2017 (15 pages).

2. (with A.M. Ciobanu) Automatic Discrimination between Cognates and Borrowings, *Proc. ACL* (2) 2015 (*53nd Annual Meeting of the Association for Computational Linguistics*), July 26–31, 2015, Beijing, China, 431–437.

3. (with A.M. Ciobanu) An Etymological Approach to CrossLanguage Orthographic Similarity. Application on Romanian, *Proc. EMNLP* 2014 (*Conference on Empirical Methods in Natural Language Processing*), October 25–29, 2014, Doha, Qatar.

4. (with A.M. Ciobanu) Automatic Detection of Cognates Using Orthographic Alignment, *Proc. ACL* (2) 2014 (*52nd Annual Meeting of the Association for Computational Linguistics*), June 22–27, 2014, Baltimore, MD, USA, 99–105.

5. (with A.M. Ciobanu, A. Dinu) Predicting Romanian Stress Assignment, *Proc. EACL* 2014 *(14th Conference of the European Chapter of the Association for Computational Linguistics*), April 26–30, 2014, Gothenburg, Sweden, 64–68.

6. (with R.-T. Ionescu) An Efficient Rank Based Approach for Closest String and Closest Substring, *PLoS ONE* 7(6): e37576. doi: 10.1371/journal.pone. 0037576.

7. (with M. Popescu, A. Dinu) Authorship Identification of Romanian Texts with Controversial Paternity, *Proc. LREC* 2008 (*6th International Language Resources and Evaluation*), 28–30 May 2008, Marrakech, Maroc, 3392–3397.

8. (with F. Manea) An Efficient Approach for the Rank Aggregation Problem, *Theoretical Computer Science*, 359, 1–3 (2006), 455–461.

9. (with A. Sgarro) A Low-Complexity Distance for DNA Strings, *Fundamenta Informaticae*, 73, 3 (2006), 361–372.

10. On the Classification and Aggregation of Hierarchies with Different Constitutive Elements, *Fundamenta Informaticae*, 55, 1 (2003), 39–50.

Further information: Principal investigator (director) of 8 funded research projects, member in other 8 research teams of funded projects.

Personal web page: http://nlp.unibuc.ro/people/liviu.html

DOBRESCU, Radu Nicolae

Born on January 11, 1946, in Brăila, Romania.

Education: Engineer degree in automatic control from the Faculty of Control and Computers of the Polytehnical Institute of Bucharest, 1968.

PhD: Polytechnical Institute of Bucharest, Faculty of Automatic Control, 1976. Thesis title: *3D Interpolator for Machine-Tools Control.* Scientific advisor Corneliu Penescu.

Positions: from 1968, teaching and research activities in the "Politehnica" University of Bucharest, Faculty of Control and Computers, with the following didactic degrees: Assistant (from 1970), Senior Lecturer (from 1976), Professor (from 1991).

Research areas/Main results:

Modern structures for the numerical control of machine tools and manufacturing flexible systems. The doctoral thesis and three books on the numerical control and especially on the finite automata are the main results obtained in this field.

Now, the interest is in CIM, DEDS and industrial robots, especially on hierarchical architectures and communication and on fuzzy structures for intelligent control, product traceability and holonic virtual manufacturing systems.

Data acquisition, processing and transmission: Establishing a conceptual framework that highlights the multiple links between information theory and complexity theory. Clarifying basic concepts in information science and emphasizing semantic differences between informational systems and informatic systems.

Establishing a conceptual relationship between information and knowledge. Explaining how new qualities appear by the emergence of order and symmetry in an evolutionary process. Defining the principles of generation and evolution of self-organizing systems and their essential properties. Using the concept of algorithmic entropy as a unifying element between information theory and complexity theory Proposing common metrics for qualitative and quantitative assessment of complexity and information.

Local area networks and industrial communication: Participation, from 1988, to the elaboration of the Romanian fieldbus PROMAG, fully compatible with the ISO-OSI recommendations and adopted as MAP product. Dedicated equipments and communications software for different fieldbus standards: PROFIBUS, Qbus,

Interbus, Fieldbus Foundation, Mbus, Suconet. Others results are obtained in developing algorithms for the control of the informational flow in LAN, managing multiples queues.

Coordination of the project ATM Server for UNI connections (together with the Technical University Hartburg – Hamburg and BBCom Hamburg, Germany).

Recent developments of communication techniques and in the design of hard-ware and software dedicated architectures for Wireless Sensor Networks and sensor-cloud interfaces.

Development of models based on free scale networks for studying large-scale IT systems.

Modeling complex systems using fractal and chaos theory. The using for the first time in Romania of a non-invasive method (based on fractal analysis) to express the relationship between the complexity of the epithelial/connective interface (as determined by fractal dimension) and the malignancy of the gastric tumor.

Leadership of the postdoctoral program (2006–2007) *Applications of fractal analysis in image processing* oriented on three main directions of research: The extension of the fractal morphometric techniques for the study of cancer disease evolution. The use of the fractal dimension for gray level images as additional textural feature in order to retrieve and to classify digital images. The use of the fractal properties and stochastic self-similarity of network traffic as a methodology to inference statistical and model characteristics of QoS in web traffic.

Administrative positions:
Member of the Professoral Council of the Control and Computers Faculty.
Member of the University Politehnica of Bucharest Senate.
Director of the Department of Automation and Industrial Informatics.
Project director for more then 40 national grants.
Project director for 4 international grants.

Editorial boards: *Computers in Industry* (Elsevier), *Journal of Intelligent Manufacturing* (Springer).

Membership to professional organizations:
Member of SRAIT (Society of Romanian Automation and Information Technology); Senior member IEEE, past-president of IEEE Romania Section (president 2010–2014); Corresponding member of AOSR (Academy of Romanian Scientists).

Honors, prizes, scientific distinctions:
IBM Faculty Award, 2004.
"Stefan Odobleja" Award of AOSR, 2008.
"Grigore C. Moisil" Prize of the Romanian Academy, 2010.
Doctor Honoris Causa, Valahia University of Târgovişte.

Books:

1. (with F. Ionescu) *Large Scale Networks. Modeling and Simulation*, CRC Press (Taylor and Francis Group), 2016.

2. *Computational Aspects of Biological Patterns Formation*, book chapter, in C. Vasilescu, M.L. Flonta, I. Crăciun, eds., *On Form and Pattern*, Romanian Academy Publ. House, Bucharest, 2015, 207–226.

3. (with M. Tanase) *Fractal Analysis of Growth Processes Modelled by Using Cellular Automata Mixes*, book chapter in P. Waliszewski, ed., *Fractals and Complexity*, 2012, 24–30.

4. (with D.A. Iordache) *Complexity and Information*, Romanian Academy Publ. House, Bucharest, 2010

5. (with D. Iordache, eds.) *Modelling Complexity*, Politehnica Press, 2007.

Representative articles:

1. (with O. Martinez Mozos, V. Săndulescu, J.M. Fernandez) Stress Detection Using Wearable Physiological and Sociometric Sensors, *International Journal of Neural Systems*, 27, 2 (2017), 1–16.

2. (with D Merezeanu) From Information to Knowledge. Transmission of Meaning, *Rev. Roum. Sci. Techn.– Électrotechn. et Énerg*., 62, 1 (2017), 115–118.

3. (with D. Merezeanu, G. Vasilescu) Context-Aware Control Platform for Sensor Network Integration in IoT and Cloud, *Studies in Informatics and Control*, 25, 4 (2016), 489–498.

4. (with M. Nicolae, D. Popescu, I. Costea) Scheduling Mechanism for Energy-Efficient Communication in Hybrid Wireless Sensor Networks, *Journal of Control Engineering and Applied Informatics*, 18, 2 (2016), 95–102.

5. Conceptual Models for Information and Knowledge, *Annals of Academy of Romanian Scientists, Series on Science and Technology of Information*, 9, 2 (2016), 5–18.

6. (with C. Vasilescu, D.E. Giza, P. Petrişor, I. Popescu, V. Herlea) Metrical Differences between Resectable and Non-Resectable Pancreatic Cancer: A Fractal Analysis, *Hepato-gastroenterology*, 59 (113) (2012), 284–288.

7. (with V.E. Oltean, R. Dobrescu, L. Ichim) On Modelling and Control of a Class of Tumour Growth Processes, *Revue Roumaine des Sciences Techniques, Serie Electrotechnique et Energetique*, 56, 1 (2011), 109–118.

8. (with V.I. Purcărea) Emergence, Self-Organization and Morphogenesis in Biological Structures, *Journal of Medicine and Life*, 4, 1 (2011), 82–90.

9. Informing Science as Conceptual Framework for Developing Information Systems, *U.P.B. Sci. Bull*., Series A, 72, 2 (2010), 197–204.

10. (with D. Andone, A. Hossu) Application of Fuzzy Model Predictive Control to a Drum-Boiler, *Integrated Computer-Aided Engineering*, 13, 4 (2006), 347–360.

Further information:

PhD thesis coordinator in the field of systems engineering, from 1991 (more than 40 completed theses).

Chairman of eight editions of the International Symposium *Interdisciplinary Approaches of Fractal Analysis*.

Member of the Organization committee of International Conferences: IEEE, IASTED, IARIA, EURASIP, etc.

Personal web page: http://doctorat.acs.pub.ro/wp–content/uploads/ 2017/01/ Activitate–stiintifica–RD.pdf

DUMITRESCU, Sorina (maiden name: Vicolov)

Born on May 4, 1968, in Tulcea, Romania.

Education: B.Sc. Faculty of Mathematics, University of Bucharest, Romania, 1990.

PhD: Faculty of Mathematics, University of Bucharest, 1997. Thesis title: *Grammar Systems*. Scientific advisor: Gheorghe Păun.

Scholarships, postdoc stages:
Sept. 2004 – June 2005: Research associate, Department of Electrical & Computer Engineering, McMaster University.
Sept. 2002 – Aug. 2004: Postdoctoral fellow, Department of Electrical & Computer Engineering, McMaster University, supervisor: Xiaolin Wu.
Oct. 2000 – Aug. 2002: Postdoctoral fellow, Department of Computer Science, University of Western Ontario, London, Ontario, supervisor: Xiaolin Wu.

Positions:
Assistant Professor (July 2005–June 2011), Associate Professor (July 2011–present), Department of Electrical & Computer Engineering, McMaster University, Canada.

Research areas: Problems in the broad area of data compression and transmission, in particular, code design algorithms and theoretical analysis of performance. More specific topics: network data compression, multiple description codes, joint source channel codes, signal quantization. Earlier interests: formal languages and automata theory, steganography and steganalysis.

Main results:
We have extended the family of scalar quantizer systems for which the global optimality of the generalized Lloyd design algorithm has been established for log-concave distributions. This family includes fixed-rate multiple description and multiresolution scalar quantizers with convex cells. When the distributions are, additionally, symmetric around their mean, the noisy channel scalar quantizers with random index assignment and convex cells are also part of this family.

Development of the most efficient globally optimal algorithms to date for certain classes of network scalar quantizers for discrete distributions, including fixed-rate multiresolution and multiple description scalar quantizers with convex cells.

Contributions to the advancement of the design and analysis of multiple description codes, including practical schemes achieving the rate-distortion limits.

Contribution to the theoretical foundation of least significant bit (LSB) steganalysis by establishing the first theoretically rigorous approach for detection of LSB steganography.

Contributions to the study of the generative capacity of parallel communicating grammar systems and cooperating distributed grammar systems.

Membership to professional organizations: ACM member, IEEE (senior member)

Honors, prizes, scientific distinctions: NSERC University Faculty Award (2007–2012).

PhD students: Xiaohan Wang (co-supervised with prof. Xiaolin Wu, 2006–2009); Ying Zhang (2007–2011), Huihui Wu (started in 2014, expected to finish in 2018); Dania Elzouki (co-supervised with prof. Jun Chen, started in 2014, expected to finish in 2018).

Books:

1. (with N. Sarshar, X. Wu, J. Wang) *Network-Aware Source Coding and Communication*, Cambridge University Press, 2011.

Representative articles:

1. On the Design of Optimal Noisy Channel Scalar Quantizer with Random Index Assignment, *IEEE Transactions on Information Theory*, 62, 2 (2016), 724–735.
2. (with Y. Wan) Bit-Error Resilient Index Assignment for Multiple Description Scalar Quantizers, *IEEE Transactions on Information Theory*, 61, 5 (2015), 2748–2763.
3. (with Y. Zhang, J. Chen, Z. Sun) LDGM-Based Multiple Description Coding for Finite Alphabet Sources, *IEEE Transactions on Communications*, 60, 12 (2012), 3671–3682.
4. Fast Encoder Optimization in Multi-Resolution Scalar Quantizer Design, *IEEE Transactions on Information Theory*, 57, 3 (2011), 1520–1529.
5. (with X. Wu) On Properties of Locally Optimal Multiple Description Scalar Quantizers with Convex Cells, *IEEE Transactions on Information Theory*, 55, 12 (2009), 5591–5606.
6. (with X. Wu) Lagrangian Optimization of Two-Description Scalar Quantizers, *IEEE Transactions on Information Theory*, 53, 11 (2007), 3990–4012.
7. (with X. Wu) Algorithms for Optimal Multi-Resolution Quantization, *Journal of Algorithms*, 50, 1 (2004), 1–22.

8. (with X. Wu, Z. Wang) Detection of LSB Steganography Via Sample Pair Analysis, *IEEE Transactions on Signal Processing*, 51, 7 (2003), 1995–2007.

9. (with Gh. Păun) On the Power of Parallel Communicating Grammar Systems with Right-Linear Components, *RAIRO Informatique Théoretique et Applications*, 31, 4 (1997), 331–354.

10. Non-Returning Parallel Communicating Grammar Systems Can be Simulated by Returning systems, *Theoretical Computer Science*, 165 (1996), 463–474.

Personal web page: http://www.ece.mcmaster.ca/~sorina/

DZIȚAC, Ioan

Born on February 14, 1953, in Poieni de sub Munte, Maramureş, Romania.

Education: "Babeş-Bolyai" University of Cluj-Napoca (1972–1977), Bachelor/eq. Master in Mathematics (1977).

PhD in informatics at "Babeş-Bolyai" University of Cluj-Napoca, 2002. Thesis title: *Parallel and Distributed Methods for Some Operator Equations Resolution.* Scientific advisor: Grigor Moldovan.

Positions: Mathematics Teacher in Oradea, Bihor County (1977–1991). Lecturer at University of Oradea (1991–2003). Associate Professor at University of Oradea (2003–2005). Associate Professor at "Agora" University of Oradea (2005–2009). Visiting Professor at University of Chinese Academy of Sciences, Beijing (2013–2016). Full Professor at "Aurel Vlaicu" University of Arad (2009–2018).

Research areas: Parallel and distributed computing, information systems, computational intelligence, artificial intelligence, soft computing, e-learning, applications of fuzzy logic in technology and economy.

Main results:

In my PhD thesis there are mathematical and computer science contributions related to parallel and distributed computing: an original synthesis of taxonomy of parallel architectures); computing methods of parallel fixed points in $\boldsymbol{R}^n$ (parallelization of classical algorithms, new proofs of some fixed point theorems, the introduction of randomized filtered asynchronous iterations method – RFAIM); systems of algebraic equations (parallelization of classical algorithms for solving nonlinear algebraic equations and comparative studies with RFAIM); ordinary algebraic equations (the most efficient parallel methods for solving the polynomial equations of higher grade).

In the fuzzy theory and applications area some properties of fuzzy quasi-pseudo-metric spaces are established. An important result is that any partial ordering can be defined by a fuzzy quasi-metric, which can be applied both in theoretical computer science and in information theory, where it is usual to work with sequences of objects of increasing information. Also are obtained decomposition theorems of a fuzzy quasi-pseudo metric into a right continuous and ascending family of quasi-pseudometrics.

I have also introduced (in a joint paper with S. Nadaban) the concept of atomic decomposition of fuzzy normed linear spaces, which play a key role in the development of fuzzy wavelet theory. We obtained decomposition theorems for fuzzy norms into a family of semi-norms, within more general settings. The results hold both for Bag-Samanta fuzzy norms and for Katsaras fuzzy norms. As a consequence, locally convex topologies induced by these types of fuzzy norms are obtained.

Together with B. Stanojevic and S. Dziţac, I have proposed a new approach to solving the full fuzzy linear fractional programming problem, which leads to good decisions in certain problems where the goals may be modelled by linear fractional functions under linear constraints, and when only vague data are available.

Administrative positions: Director of Mathematics & Informatics Department at University of Oradea (2004–2005). Head of IT Chair at "Agora" University (2005–2008). Director of R&D Center at "Aurel Vlaicu" University of Arad (2009–2017). Rector of "Agora" University (2012–2020).

Editorial boards:

International Journal of Computers Communications & Control (IJCCC; Oradea, Romania; founder and editor-in-chief), *Financial Innovation* (Springer), *Journal of System and Management Sciences* (Beijing Jiatong University, China), *Broad Research in Artificial Intelligence and Neuroscience* (Romania), *Mathematics, Informatics, Physics Series – Bulletin of PG University of Ploiesti, Theory and Applications in Mathematics and Computer Science* (Arad, Romania; associate editor), *Scientific and Technical Bulletin, Series: Electrotechnics, Electronics, Automatic Control and Computer Science* (Arad, Romania), *Journal of Systemics, Cybernetics and Informatics* (The International Institute of Informatics and Systemics, USA), *Business, Management and Education* (Vilnius Gediminas Technical University, Lithuania), *Baltic Journal of Modern Computing.*

Membership to professional organizations:

The International Academy of Information Technology and Quantitative Management – in Board (since 2014).

IEEE Senior Member (since 2011).

IEEE Computational Intelligence Society Member (since 2011).

ROMAI: Romanian Society of Applied and industrial Mathematics (member since 1995; vice-president: 1996–2011).

SRAIT – Romanian Society of Automation and Applied Informatics – Arad branch (secretary: 2010–2014)

RNG-ISCB: Romanian National Group of International Society for Clinical Biostatistics (since 2007).

SSMAR – Scientific Society of Management from Romania (since 2010).

Advisory Board member at Graduate School of Management of Technology, Hoseo University, Asan, South Korea (since 2016).

Honors, prizes, scientific distinctions:

Diploma of Excellence for Research, Senate of "Aurel Vlaicu" University of Arad, 2015 and 2016.

Certificate of Excellence for software – the Senate of "Aurel Vlaicu" University of Arad, 2010.

"Teacher of the Year 2008" Diploma – Senate of University "Agora", Oradea.

Diploma of Excellence – Economic Faculty Association in Romania (AFER).

Popularity Award for his work entitled "A Distributed Database for Generating Benchmark Test Informatics" presented at the *NVIC*, 2006, Bucharest, 2006.

Prize ROMAI – Romanian Society of Applied and Industrial Mathematics 2003.

The title "Professor highlighted" granted by Ministry of Education, 1988.

Books:

1. *Parallel Computing,* Ed. Univ. Oradea, 2001 (397 pages, in Romanian).

2. *Parallel and Distributed Methods for Algebraic Systems Resolution*, CCC Publications, 2006 (150 pages).

3. *Artificial Intelligence,* Ed. Univ. "Aurel Vlaicu", Arad, 2008 (182 pages, in Romanian).

4. (with L.A. Zadeh, D. Tufiș, F.G. Filip) *From Natural Language to Soft Computing: New Paradigms in Artificial Intelligence*, The Publ. House of the Romanian Academy, Bucharest, 2008 (268 pages).

Representative articles:

1. (with F.G. Filip, M.J. Manolescu) Fuzzy Logic Is Not Fuzzy: World-Renowned Computer Scientist Lotfi A. Zadeh, *International Journal of Computers Communications & Control*, 12, 6 (2917), 748–789.

2. (with S. Nadaban) Some Properties and Applications of Fuzzy Quasi-Pseudo-Metric Spaces, *Informatica*, 27, 1 (2016), 141–15.

3. (with B. Stanojevic, S. Dziţac) On the Ratio of Fuzzy Numbers Exact Membership Function Computation and Applications to Decision Making, *Technological and Economic Development of Economy*, 21, 5 (2015), 815–832.

4. The Fuzzification of Classical Structures: A General View, *International Journal of Computers Communications & Control*, 10, 6 (2015), 775–793.

5. (with S. Nadaban) Atomic Decompositions of Fuzzy Normed Linear Spaces for Wavelet Applications, *Informatica*, 25, 4 (2014), 643–662.

6. (with T. Vesselenyi, R.C. Tarca) Identification of ERD Using Fuzzy Inference Systems for Brain-Computer Interface, *International Journal of Computers Communications & Control, Special Issue on Fuzzy Sets and Systems*, 6, 3 (2011), 403–417.

7. (with D.C. Secui, S. Dziţac, G.V. Bendea) An ACO Algorithm for Optimal Capacitor Banks Placement in Power Distribution Networks, *Studies in Informatics and Control*, 18, 4 (2009), 305–314.

8. (with B.E. Bărbat) Artificial Intelligence + Distributed Systems = Agents, *International Journal of Computers Communications & Control*, 4, 1 (2009), 17–26.

9. (with I. Moisil) Advanced AI Techniques for Web Mining, *Proc. of MAMECTIS* '08, 2008, 343–346.

10. (with T. Vesselenyi, S. Dziţac, M.-J. Manolescu) Fuzzy and Neural Controllers for a Pneumatic Actuator, *International Journal of Computers Communications & Control*, 2, 4 (2007), 375–387.

Further information:

– Invited talks at many universities from Europe, China, India, South Koreea.

– Initiator of Computer science courses and master programs (parallel computing, didactics of information, distributed systems, etc.) at universities from Oradea and Arad.

– Founder of the *International Conference on Computers, Communications and Control* at University "Agora" of Oradea (2006).

– Founder of the *International Journal of Computers, Communications & Control* at University "Agora" of Oradea (2006).

Personal web page: http://dzitac.ro/en/ioan

ENEA, Constantin

Born on December 6, 1980, in Târgu-Neamț, Romania.

Education: Bachelor degree in computer science, "Al.I. Cuza" University, Iaşi, Romania (June 2003).

PhD: University Paris-Est Créteil, France, and "Al.I. Cuza"University, Iaşi, Romania, 2008. Thesis title: *Abstraction Techniques for the Verification of Concurrent Systems.* Scientific advisors: Cătălin Dima and Ferucio Laurențiu Țiplea.

Scholarships, postdoc stages:
Excellence PhD scholarship "Eiffel Doctorat" awarded by EGIDE, France (2006–2007).
Postdoc, LIAFA, CNRS & University Paris Diderot – Paris 7, France (2008–2009).

Positions:
Associate Professor, University Paris Diderot – Paris 7, France (since 2009).

Research areas: Developing formal verification and analysis techniques to help the construction of reliable software systems. More precisely: algorithmic and logical foundations for constructing reliable software, algorithmic verification, model checking, static analysis, programming abstractions for concurrent and distributed software.

Main results:
Program verification requires reasoning about complex, unbounded size data structures that may carry data ranging over infinite domains. Examples of such structures are multi-linked data structures, arrays, as well as compositions of these structures. Programs manipulating such structures can perform operations that may modify their shape (due to dynamic creation and destructive updates) as well as the data attached to their elements. An important issue is the design of logic-based frameworks allowing to express assertions about program configurations (at given control points), and then to check automatically the validity of these assertions, for all computations. This leads to the challenging problem of finding relevant compromises between expressiveness and decidability. We have proposed a fragment of first-order logic with reachability, called CSL, which has a decidable satisfiability problem and can capture several aspects of the program configurations: the shape

of the allocated memory, the size of the data structures and the stored values [CONCUR 2009]. This work remains important in the field of program verification since it has not been outmatched by any later results, i.e., there is no other decidable logic that is strictly more expressive than CSL. Also, we have proposed several verification frameworks based on separation logic with inductive definitions (SL), which is well-known for its support of local reasoning based on the "frame rule". A large variety of SL fragments and algorithmic techniques for deciding verification conditions have been introduced in the literature. However, many of these algorithms are based on ad-hoc techniques, that are hardly extensible beyond the fragment for which they have been introduced, and concern mostly shape constraints (the data stored in the data structures is ignored). We have tackled these issues successfully by defining decision procedures, e.g., the one published in *Formal Methods in System Design*, which are based on well-established concepts and tools like SAT/SMT solvers or decision problems in automata theory, and which extend in a sound manner beyond the fragment for which they are sound and complete.

Modern software developments kits simplify the programming of concurrent or distributed applications by providing shared state abstractions which encapsulate low-level accesses into higher-level abstract data types (ADTs). Programming such abstractions is however error prone. To minimize synchronization overhead between concurrent ADT invocations, implementors avoid blocking operations like lock acquisition, allowing methods to execute concurrently. However, concurrency risks unintended inter-operation interference, and risks conformance to well–established correctness criteria like eventual consistency, causal consistency, or linearizability. We have investigated the theoretical limits of verifying such criteria, showing that for instance, checking linearizability or causal consistency is undecidable in general [*ESOP* 2013, *POPL* 2017], and checking eventual consistency is **EXPSPACE**-complete [*POPL* 2014]. When relevant, we have also investigated restrictions under which the problems become decidable (and efficiently solvable) which concern both the class of implementations and the class of specifications [*ICALP* 2015, *POPL* 2017]. Under these restrictions, we have proposed general polynomial-time reductions to assertion checking which enable the use of the existing verification technology for verifying concurrent or distributed ADTs. Furthermore, we have proposed testing-based methods for discovering violations in practical implementations [*POPL* 2015, *PLDI* 2015], which provide exponential speedups with respect to previous works. They can be used not only for systematic testing with few ADT method invocations, but also for runtime monitoring, where the number of operations grows without limit.

Administrative positions:

Head of the "Modeling and verification" team, IRIF (CNRS & University Paris Diderot – Paris 7).

Membership to professional organizations: ACM.

Honors, prizes, scientific distinctions:

ERC Starting Grant "Formal Specification and Verification of Distributed Data Structures" (2016–2021).

"Best student paper" at the 5th International Central and Eastern European Conference on Multi-Agent Systems (CEEMAS 2007).

PhD students: Jad Hamza (2012–2016), Suha Orhun Mutluergil (2013–2018).

Representative articles:

1. (with A. Bouajjani, C. Drăgoi, M. Sighireanu) A Logic-Based Framework for Reasoning About Composite Data Structures, *Concurrency Theory, 20th International Conference, CONCUR* 2009, Bologna, Italy, September 1–4, 2009, *LNCS* 5710, Springer, 2009.

2. (with A. Bouajjani, C. Drăgoi, M. Sighireanu) On Inter-Procedural Analysis of Programs with Lists and Data, *Proc. 32nd ACM SIGPLAN Conference on Programming Language Design and Implementation, PLDI* 2011, San Jose, CA, USA, June 4–8, 2011, ACM 2011.

3. (with A. Bouajjani, M. Emmi, J. Hamza) Verifying Concurrent Programs Against Sequential Specifications, *Programming Languages and Systems – 22nd European Symposium on Programming, ESOP* 2013, Held as part of the *European Joint Conferences on Theory and Practice of Software*, ETAPS 2013, Rome, Italy, March 16–24, 2013, *LNCS* 7792, Springer, 2013.

4. (with A. Bouajjani, J. Hamza) Verifying Eventual Consistency of Optimistic Replication Systems, *41st Annual ACM SIGPLAN–SIGACT Symposium on Principles of Programming Languages, POPL* '14, San Diego, CA, USA, January 20–21, 2014.

5. (with A. Bouajjani, M. Emmi, J. Hamza) Tractable Refinement Checking for Concurrent Objects, *Proc. 42nd Annual ACM SIGPLAN–SIGACT Symposium on Principles of Programming Languages, POPL* 2015, Mumbai, India, January 15–17, 2015.

6. (with M. Emmi, J. Hamza) Monitoring Refinement Via Symbolic Reasoning, *Proc. 36th ACM SIGPLAN Conference on Programming Language Design and Implementation*, Portland, OR, USA, June 15–17, 2015.

7. (with A. Bouajjani, M. Emmi, J. Hamza) On Reducing Linearizability to State Reachability, *Automata, Languages, and Programming – 42nd International Colloquium, ICALP* 2015, Kyoto, Japan, July 6–10, 2015, *LNCS* 9135, Springer, 2015.

8. (with O. Lengál, M. Sighireanu, T. Vojnar) Compositional Entailment Checking for a Fragment of Separation Logic, *Formal Methods in System Design*, 51, 3 (2017), 575–607.

9. (with A. Bouajjani, R. Guerraoui, J. Hamza) On Verifying Causal Consistency, *Proc. 44th ACM SIGPLAN Symposium on Principles of Programming Languages, POPL* 2017, Paris, France, January 18–20, 2017.

10. (with A. Bouajjani, M. Emmi, S.O. Mutluergil) Proving Linearizability Using Forward Simulations, *Computer Aided Verification – 29th International Conference, CAV* 2017, Heidelberg, Germany, July 24–28, 2017, *LNCS* 10427, Springer, 2017.

Further information:

Program co-chair: EPIT 2018 Software Verification Spring School, 8th Young Researchers Workshop on Concurrency Theory (YR–CONCUR 2018).

Program Committee: 16th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI 2015), 28th International Conference on Computer Aided Verification (CAV 2016), 15th International Symposium on Automated Technology for Verification and Analysis (ATVA 2017), 28th International Conference on Concurrency Theory (CONCUR 2017), Recent Advances in Concurrency and Logic (RADICAL 2017), 45th ACM SIGPLAN Symposium on Principles of Programming Languages (POPL 2018), 5th Workshop on Principles and Practice of Consistency for Distributed Data (PAPOC 2018), 6th Edition of the International Conference on Networked Systems (NETYS 2018), 16th International Symposium on Automated Technology for Verification and Analysis (ATVA 2018).

Personal web page: www.irif.fr/~cenea

FARCAŞ, Dezideriu Dan

Born on April 1, 1940, in Reşiţa, Caraş-Severin county, Romania.

Education: Faculty of Mathematics and Physics, State University of Timişoara (1956–1960).

PhD in mathematics, computing machines specialty, at Bucharest University, Faculty of Mathematics, 1979. Thesis title: *Random Automata with Utility Functions*. Scientific advisor: Paul Constantinescu.

Scholarships, postdoc stages: IBM (in Bucharest, Paris and Bonn), Sophia Antipolis (France).

Positions, main activities and responsibilities:

Computer programmer and Assistant Lecturer at the Polytechnic University Timişoara: training, programming, research (1962–1967).

Expert at the Management Training Center (CEPECA): training, projects, research (1967–1982); manager of nationwide IT projects in health and R&D management, participation in many other projects, mainly for production planning and programming in industrial plants.

Chief of the office for mathematical models in healthcare at the Center for Computing and Health Statistics (CCSS) of the Ministry of Health Romania: IT projects, mathematical modelling, health economics (1983–1990).

Expert at the National Commission for IT (part time, and for audits and projects) (1991–1999).

Expert and adviser (part time) at the Ministry of Research and Technology, for Research and Development Strategies in Romania (1994–2000).

Temporary adviser to the World Health Organization in IT projects (*Euphin East*, *Highlights on Health*; 1997–2001).

Chief of a service for research and strategies in eHealth at CCSS (1998–2003).

Chief of the Office for eHealth strategies and projects at the Center for Computing and Health Statistics (CCSS) of the Ministry of Health Romania (2003– 2010).

Expert in eHealth Interoperability Working Group of the Directorate-General for Information Society and Media of the European Commission (2006–2007).

Research areas, main results: Computer simulation of neural network activity, computer simulation of cell activity, abstract random automata, computer simulation in health economics.

Honors, prizes: The Book *Informatica medicală* was awarded, in 1991, by the Romanian Academy, with the "Gheorghe Marinescu" Prize.

Administrative positions:

Chief of the office for mathematical models and operations research in health care, at the Centre for Computing and Health Statistics (CCSS) of the Ministry of Health Romania (1982–1990, 1991–1992).

Director at the Romanian Institute of Management (IROMA) (1990).

Director of CCSS (1997–1998), deputy director for IT (1991–1994, 2001–2002), and chief of service for research and strategies (1994–1996, 1998–2001, 2003) at CCSS.

Membership to professional organizations:

Full member of the Romanian Academy of Medical Sciences (since 1993; correspondent member 1991–1993) and chief of the IT Committee of that Academy (1991–2000).

Vice-president of the society of medical informatics, Romania (1992–2010).

Member of the Romanian Committee for History and Philosophy of Science and Technology of the Romanian Academy (since 2013).

Books (a selection; all in Romanian):

1. *Calculatorul electronic şi gândirea umană*, Ed. Albatros, Bucureşti, 1978.
2. *Automate aleatoare cu utilități*, Ed. Ştiințifică şi Enciclopedică, Bucureşti, 1987.
3. (in collaboration) *Informatica medicală*, Ed. Medicală, Bucureşti, 1988.
4. *Labirintul cunoaşterii*, Ed. Paideia, Bucureşti, 2009.
5. *Informatica de sănătate din România, 50 de ani de istorie trăită*, Ed. Universitară "Carol Davila", Bucureşti, 2014.

Representative papers:

1. Experiences of Modeling the Activity of Neuronal Networks by Means of Electronic Digital Computers, *Elektronische Informationsverarbeitung und Kybernetik* (*E.I.K.*), 2, 4 (1966), 213–221.
2. The Mnemon, a New Hypothesis in Neuronal Network Modelling, *E.I.K.*, 4 (1968), 7–24.
3. Simulation of Elektroencephalographic Waves, in vol. *Modern Trends in Cybernetics and Systems*, Springer, Berlin, and Ed. Tehnică, Bucharest, vol. III, 1977, 1073–1077.
4. (with Z. Simon) Behavior of a Cell-Cycle-Model Studied on an Electronic Digital Computer, *Studia Biophysica*, 2, 5 (1967), 339–347.
5. (with Z. Simon) Computer Study of Competition Situations Within a Cell Model, *Studia Biophysica*, 6, 2 (1968), 143–147.

6. (with Z. Simon, A. Cristea) Functioning of a Cell Model, in vol. *Quantitative Biology of Metabolism – Third Intern. Symp. on Quantitative Biology*, Helgoland, 1967, Springer, 1968, 71–74.

7. Random Automata with Utilities. Multi and Meta-Automata, in vol. *Studies in Probability and Related Topics*, Ed. Nagard, Roma, 1983, 203–208.

8. Metaagent, as an Interdisciplinary Approach, in *Cybernetics, Models and Technics; 10th International Congres in Cybernetics and Systems*, vol. III, 1996, 688–693.

9. (with C. Popescu, I.M. Copil) Simulation of the Social and Economic Effects of Decreasing the Aged Population's Mortality and Morbidity due to Various Causes, *Proc. National Congress of Gerontology and Geriatrics*, Bucharest, 1988, vol. I, 317–323.

10. Measuring National Interest in Funding Healthcare IT Projects, in *Current Perspectives in Healthcare Computing Conference Harrogate*, 1998, part II, 227–232.

Further information: Courses at CEPECA Bucharest (Management Training Centre), CCSS Bucharest (Centre for Health Computing and Statistics), etc., about: IT projects management, databases, computer programming, teleactivities, mathematical modeling in healthcare, health economics, demography, etc. (1969 to 1996).

FRENȚIU, Militon

Born on February 19, 1945, in Rădeşti, com. Almaş, Arad county, Romania.

Education: Faculty of Mathematics and Mechanics, "Babeş-Bolyai" University, Cluj-Napoca, 1962–1967.

PhD: Brunel University, UK, 1977. Thesis title: *Some Aspects on Error-Correction in Programming Languages.* Scientific advisor: Igor Aleksander.

Scholarships, postdoc stages:
PhD studies at Brunel University, 1974–1977.
Visit at Moldova State University, Chişinău, 13–18 October 1997.
Didactic visit at National Politehnic University of Athens, 14–20 November 1999.

Positions:
"Babeş-Bolyai" University: (1) Faculty of Mathematics and Mechanics: Teaching Assistant (1967–1968), Assistant Professor (1968–1978), Lecturer (1978–1990); (2) Faculty of Mathematics and Computer Science: Associate Professor (1990–1995), Professor (from 1995 to 2012, when retired).

Research areas: Formal languages, program correctness, classification methods with applications in software engineering (SE), archeology and geology, simulation, software metrics, education.

Main results:
I have started the research activity in the approximation theory by introducing new approximation operators that have the saturation property [a1]. Then I changed the field of research to computer science. First I was interested to correct syntax errors in programs by extending a syntactical analyzer to correct some errors (in the PhD thesis and [a2]). Next, I considered that a more important problem is to analyse the correctness of algorithms/programs [a4, a6, a8, b4], or to use methods to write correct programs [a5, b3, b4]. Various classification methods were used to solve problems met in SE, in archeology and in geology [a9, a10]. One important problem in SE is the estimation of cost and time to build a software product. A method based on analogy with similar previously finished projects is proposed in [a7]. There are problems that cannot be solved by exact mathematical methods/ formulas. Using simulation to solve such problems was suggested in [a3]. Also, the

consequences of these and many other theoretical results on the methodology of SE, on the quality of SE projects, on improving the software processes, and on teaching have been discussed [a4, a5, a6, b3, b4]. These concerns determined me to introduce new disciplines in the academic curriculum: Verification and validation (third year); Modeling and simulation (third year); Formal methods in SE (master); Software metrics (master).

An important attention was paid to the development of computer science teaching. For students needs I have prepared and printed 18 textbooks or other teaching materials and published 17 books.

Administrative positions: Head of Programming Languages Chair; Head of Computer Science Department; acting in the Faculty Board, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University, Cluj-Napoca.

Editorial boards: *Studia Universitatis "Babeş-Bolyai", Seria Informatica* (editor-in-chief); *Applied Medical Informatics.*

Editor of the Proceedings of the international conferences KEPT (*Knowledge Engineering. Principles and Techniques*), and of the National Conferences ZAC (*Zilele Academice Clujene*).

Membership to professional organizations: Association of Computing Machinery; Romanian Mathematical Society

PhD students: Horia F. Pop (1995), Mircea Andraşiu (1999), Vasile Prejmerean (1999), Simona Motogna (2000), Alina Mârza (2000), Constantin Popescu (2001), Mihaiela Lupea (2002), Gabriela Şerban (2003), Marin Iuga (2004), Daniel Robert Danciu (2005), Dana Lupşa (2006), Anca Vasilescu (2006), Cristina Luca (2006), Adriana Tarţa (2008), Grigoreta Cojocar (2008), Andreea Vescan (2008), Gabriela Droj (2008), Costel Aldea (2009), Vladiela Petraşcu (2011), Flavia Zamfirache (2011), Andreea Mihiş (2011), Camelia Stanca (Şerban) (2012), Camelia Chisăliță (2013), Alexandra Băicoianu (2016).

Books:

b1. (with Gh. Coman) *Introducere în informatică*, Ed. Dacia, Cluj-Napoca, 1982 (213 pages).

b2. (with B. Pârv) *Elaborarea programelor. Metode şi tehnici moderne*, Ed. Promedia, Cluj-Napoca, 1994 (208 pages).

b3. (with H.F. Pop) *Fundamentals of Programming*, Ed. Presa Universitară Clujană, 2007 (220 pages).

b4. *Verificarea şi validarea sistemelor soft*, Ed. Presa Universitară Clujană, 2010 (232 pages).

b5. (with I.A. Rus) *Metodologia cercetării ştiinţifice în informatică*, Ed. Presa Universitară Clujană, 2014 (139 pages).

Representative articles:

a1. Linear Combinations of Bernstein Polynomials and Mirakyan Operators, *Studia Univ. "Babeş-Bolyai"*, 1 (1970), 63–68.

a2. Error Correction in a Simple Precedence Language, *Mathematica*, 20(43), 2 (1978), 159–162.

a3. (with T. Chiorean) Determinarea prin simulare a capacității portante a elementelor de rezistență ale unei construcții, *Proc. Fifth Computer Science Coll*., Iaşi, October 1985, 786–788.

a4. On Program Correctness and Teaching Programming, *Computer Science Journal of Moldova*, 5, 3 (1997), 250–260.

a5. (with V. Niculescu) Designing Correct Parallel Programs from Specifications, *Proc. 8th World Multiconference on Systemics, Cybernetics and Informatics* (SCI 2004), Orlando, USA, July 18–21, 2004, 173–178.

a6. Program Correctness in Software Engineering Education, *Proc. International Conference on Computers and Communications ICCCM4*, Oradea, 2004, 154–157.

a7. (with H.F. Pop) Effort Estimation by Analogy Using a Fuzzy Clustering Approach, *Proc. International Conference KEPT* 2009 (*Knowledge Engineering Principles and Techniques*), Cluj-Napoca, July 2–4, 2009, *Studia Universitatis "Babeş-Bolyai", Series Informatica*, 54 (2009), special issue, 202–205.

a8. (with F. Crăciun) Why Must We Teach Verification and Validation to Undergraduates? *KEPT2011 – Knowledge Engineering Principles and Techniques,* Cluj-Napoca, July 2–4, 2011, 295–304.

a9. (with Gh. Lazarovici) Methods for Automated Classification Used in Archaeology. An Application to Neolithic Graves and Ornaments, *Proc. First Romanian Conference on the Applied Physics Methods in Archaeology*, 1 (1988), 131–146.

a10. (with H.F. Pop) Applications of Principal Components Methods, *Proc. International Conference Complexity and Intelligence of the Artificial and Natural Complex Systems. Medical Applications of the Complex Systems, Biomedical Computing*, Târgu Mureş, November 8–10, 2008, 267–270.

Further information:

One of the organizers of the international conferences KEPT (*Knowledge Engineering. Principles and Techniques*).

UBB coordinator for the Tempus project Advanced Educational Technology Center – Tempus S–JEP 12518–97, 1997–2000.

Personal web page: https://www.cs.ubbcluj.ro/~mfrentiu

GAINDRIC, Constantin

Born on September 11, 1941, in Zăicani, Rîşcani county, Republic of Moldova.

Education:
"Alecu Russo" State Pedagogical Institute, Bălţi, Republic of Moldova (1957–1962), postgraduate studies at the Central Economic Mathematical Institute of the Academy of Sciences of the USSR, Moscow (1964–1966).

PhD: Central Economic Mathematical Institute of the Academy of Sciences of the USSR, Moscow, 1972. Thesis title: *Some Generalizations of Travelling Salesman Problem and Methods for Their Solution*. Scientific advisors: Yurii Oleinic-Ovod and Petru Soltan.

Habilitation: Technical University of Moldova, Chişinău. Thesis title: *Mathematical Methods of Elaboration and Substantiation of Decisions in Social-Economic Systems*, 2000.

Positions:
Director (1991–2006), Principal Researcher (2006 – present), Institute of Mathematics and Computer Science of the Academy of Sciences of Moldova.

Researcher (1964–1967), Deputy Director (1977–1991), Institute of Mathematics and Computing Centre of the Academy of Sciences of the Moldavian SSR.

Head of Section "Transport Modeling", Head of Department "Economic and Mathematical Methods in Planning" (1967–1970), Deputy Director (1973–1977), Institute for Economic Research and Technical and Scientific Information of the State Planning Committee of the Moldavian SSR.

Acting Director (1972–1973), Institute of Planning of the State Planning Committee of the Moldavian SSR.

Director (1970–1972), Computing Center of the State Planning Committee of the Moldavian SSR.

Research areas: Mathematical modeling, optimization, intelligent systems and applications, decision support systems.

Main results:
There were proposed solutions to the problem of calculating optimal routes for transporting homogeneous goods in small-batch cargoes (compared to vehicle

capacity) from a warehouse to a large number of consumer points. This problem was formulated as a generalization of the *m-Travelling Salesman Problem* and a solution method was proposed based on the branch and bound scheme.

An information system was developed based on a heuristic algorithm using the particularities of the Moscow transport network, the location of the consumption points and the specificity of the goods transported. A similar system has also been used for calculation of cargo transportation in Baku and the Republic of Moldova.

There was proposed a structure of decision support systems (DSS) in which both known ideas and approaches are realized, as well as some new possibilities that ensure the functionality of the system and the convenience for the decision-maker in solving the problem. This structure allows a unique approach, regardless of the field under consideration and the nature of the problem being solved. Some DSSs have been developed including:

– DSS for monitoring the financing of projects during the elaboration and execution of a technical-scientific program;

– A computer system for ultrasound diagnosis for ultrasound doctors, which implements artificial intelligence techniques, especially expert systems, image processing, clustering, rapid search, integrated knowledge, data and imaging bases.

A technology has been developed that allows creating medical information systems that have been applied in several national and international projects.

In the field of the information society building, the following solutions have been proposed: for electronic services in public administration (e-government) and freedom of information; for connectivity and public access to information society services at community level. He has participated in the elaboration of the National Strategy for Building the Information Society "Electronic Moldova" and the Action Plan, approved by the Government.

Administrative positions:

Head of Department "Economic and Mathematical Methods in Planning" at the Institute for Economic Research and Technical and Scientific Information of the State Planning Committee of the Moldavian SSR, 1967–1970.

Director of the Computing Center of the State Planning Committee of the Moldavian SSR, 1970–1972.

Deputy director for research of the Institute for Economic Research and Technical and Scientific Information of the State Planning Committee of the Moldavian SSR, 1972–1977.

Deputy director for research at the Institute of Mathematics and Computing Centre of the Academy of Sciences of the Moldavian SSR, 1977–1991.

Director of the Institute of Mathematics and Computer Science of the Academy of Sciences of Moldova, 1991–2006.

President of the Supreme Commission for Attestation of the Republic of Moldova, 2002–2004.

President of the National Council for Accreditation and Attestation of the Republic of Moldova, 2004–2009.

Editorial boards: *Computer Science Journal of Moldova* (Chişinău, editor-in-chief); *Buletinul A.Ş.M. Matematică* (Chişinău); *Studies in Informatics and Control*, Romanian Academy (Bucharest); *International Journal on Information Theories and Applications* (Bulgarian Academy of Sciences, Sofia); *Управляющие системы и машины* (Ukrainian National Academy of Sciences, Kiev); *Известия Орловского государственного технического университета, серия Информационные системы и технологии* (Orel, Russia); *International Journal of Computers, Communication and Control* ("Agora" University, Oradea).

Membership to professional organizations: Balkan Union for Fuzzy Systems, Romanian Society of Mathematical Modeling, Mathematical Society of the Republic of Moldova.

Honors, prizes, scientific distinctions: Medal of Civic Merit – 1996; Award of the Academy of Sciences of Moldova – 2002; Award of the Seminar "Gr.C. Moisil" – 2004; Order of Labour Glory – 2006; First degree Diploma of the Government of the Republic of Moldova – 2006; Medal "Dimitrie Cantemir" – 2006; Jubilee Medal "60 years since foundation of the first academic institutions in the Republic of Moldova" – 2006; Award "Academician C. Sibirsky" – 2008; Jubilee Medal "70 years since foundation of the first academic institutions in the Republic of Moldova and 55years of the foundation of the Academy of Sciences of Moldova" – 2016; Medal "Nicolae Milescu Spătaru" – 2016.

Doctor honoris causa of University "A. Russo", Bălți (2006), and of State University Tiraspol (2011).

Corresponding Member of the Academy of Sciences of Moldova, 2007.

PhD students: I. Ocrain (1986), I. Verlan (1989), P. Bogatencov (1991), M. Ungureanu (1992), O. Burlaca (2006), A. Grimut (2009), S. Puiu (2013), A. Reşetnicov (2016). Supervisor of Doctor in Habilitation: S. Cojocaru (2007), O. Lozan (2012).

Books:

1. *Decision Making. Methods and Technologies* (in Romanian), Chişinău, Ştiinţa, 1998.
2. (with S. Cojocaru) *Considerations on the Building of the Information Society in Moldova* (in Romanian), Institute of Mathematics and Computer Science of the Academy of Sciences of Moldova, Chişinău, 2003.

3. (with S. Cojocaru, eds.) *Workshop on Foundations of Informatics: Proceedings* FOI-2015, August 24–29, 2015, Chişinău/Inst. of Mathematics and Computer Science, Acad. of Sciences of Moldova, 2015.

4. (with S. Cojocaru, I. Druguş, eds.) *Conference on Mathematical Foundations of Informatics*, November 9–11, 2017, Chişinău, Moldova, Inst. of Mathematics and Computer Science, 2017.

Representative articles:

1. Fuzzy Evaluation Processing in Decision Support Systems, in *Systematic Organization of Information in Fuzzy Systems*, IOS Press, NATO Science Series III Computer and Systems Sciences, v. 184, 2003, 355–358.

2. (with L. Burţeva, S. Cojocaru, G. Magariu, T. Verlan) Digital Divide: Introduction to the Problem, in *Information Technologies Communication and Human Development: Opportunities and Challenges*, Idea Group Inc., 2006, Hershey, London, Melbourne, Singapore, 57–76.

3. Decision support systems in ultrasound diagnostics, *Computer Science Journal of Moldova*, 17, 3 (51) (2009), 255–277.

4. (with L. Burtseva, S. Cojocaru, O. Popcova, I. Secrieru) Ultrasound Diagnostics System SonaRes: Structure and Investigation Process, *Second International Conference Modelling and Development of Intelligent Systems,* 2011, Sibiu, Romania, "Lucian Blaga" University Press, Sibiu 2011, 28–35.

5. with N. Bruc, S. Cojocaru, E. Grabov, V. Macari, G. Magariu, T. Verlan) Management of Research Organization: Informational Support, *Memoirs of the Scientific Sections of the Romanian Academy. Computer Science*, Series IV, 34 (2011), 185–200.

6. (with L. Burtseva, S. Cojocaru) Images and Rules Based Decision Support System in Ultrasound Examination of Abdominal Zone, *Memoirs of the Scientific Sections of the Romanian Academy. Computer Science,* Series IV, 24 (2011), 173–184.

7. (with S. Cojocaru, O. Popcova, I. Secrieru) Concept of Shared Platform for Clinicians and Researchers in Domain of Ultrasound Diagnostics, *Proc. 2nd Inter. Conf. on Nanotechnologies and Biomedical Engineering ICNBME,* Chişinău, 2013, 667–670.

8. (with S. Cojocaru, O. Popcova, S. Puiu, I. Secrieru) Emergency-SonaRes: A System for Ultrasound Diagnostics Support in Extreme Cases, Chapter 18 in *Improving Disaster Resilience and Mitigation. IT Means and Tools*, Springer, Berlin, 2014, 283–292.

9. (with S. Cojocaru, O. Popcova, I. Secrieru) SonaRes Platform for Development of Medical Informatics Applications, *Proc. 3rd International Conference on Nanotechnologies and Biomedical Engineering ICNBME*-2015, Chişinău, *IFMBE Proceedings*, Springer, Berlin, 55, 450–453.

10. (with I. Secrieru, S. Cojocaru, O. Popcova, S. Țurcan) Classification of Early Stages of NAFLD Based on Dual Diagnostic Methods, *Computer Science Journal of Moldova*, 23, 3 (69) (2015), 376–385.

11. (with S. Cojocaru, I. Secrieru, S. Puiu, O. Popcova) Multilayered Knowledge Base for Triage Task in Mass Casualty Situations, *Computer Science Journal of Moldova*, 24, 2(71) (2016), 202–212.

Further information:

Member of the Program Committees of many European and national conferences and workshops in computer science, informational systems and applications.

Participation in many research projects, some of them still in progress.

Personal web page: http://www.math.md/people/gaindric–constantin/

GEORGESCU, George

Born on April 4, 1946, in Căpreni village, Gorj county, Romania.

Education: Faculty of Mathematics and Mechanics, Bucharest University; 1964– 969.

PhD: Institute of Mathematics of the Romanian Academy, 1972. Thesis title: *Theta-Valued Łukasiewicz Algebras*. Scientific advisor: Grigore C. Moisil.

Positions: Researcher (1970–1975), Institute of Mathematics of the Romanian Academy; Lecturer, Associate Professor, Professor (1976–1996), Military Technical Academy; Professor (1996–2011), Faculty of Mathematics and Computer Science.

Research areas: Many-valued logics, algebraic logic, universal algebra, lattice theory, model theory, fuzzy logic.

Main results:

Theta-valued Łukasiewicz-Moisil algebras (structure, duality theory, injective objects and injective hulls, monadic and polyadic objects).

Algebraic logic for some non-classical logics: polyadic Heyting algebras, modal polyadic algebras, tense polyadic algebras, etc).

MV-algebras and Łukasiewicz logic: classes of ideals, remarkable objects, convergence, sheaf duality, states, monadic and polyadic Pavelka algebras).

Non-commutative many-valued algebras: pseudo-MV algebras, pseudo-BL algebras, pseudo-MTL algebras, pseudo-hoops, etc.

Bosbach states on residuated structures.

Concept lattices, similarity and Galois connections in non-commutative fuzzy logic.

Forcing, Boolean-valued models, probabilistic models.

Modal and tense operators in various logical algebras.

PhD students: Laurenţiu Leuştean (2004), Dana Piciu (2004), Andrei Popescu (2005), Lavinia Ciungu (2007), Claudia Mureşan (2010), D. Diaconescu (2012), Carmen Chiriţă (2012).

Books:

1. (with V. Boicescu, A. Filipoiu, S. Rudeanu) *Łukasiewicz-Moisil Algebras*, North-Holland, Amsterdam, 1991.

Representative articles:

1. (with C. Vraciu) On the Characterization of Centered Łukasiewicz Algebras, *J. Algebra*, 16 (1970), 486– 495.

2. A Representation Theorem for Polyadic Heyting Algebras, *Algebra Universalis*, 14 (1982), 197–209.

3. Algebraic Analysis of the Topological Logic L(I), *Math. Logic Quarterly*, 28 (1982), 447– 454.

4. (with I. Voiculescu) Isomorphic Sheaf Representations of Normal Lattices, *J. Pure Appl. Algebra*, 45 (1987), 213– 234.

5. (with A. Filipoiu) On Values in Relatively Normal Lattices, *Discrete Math.*, 161 (1996), 87–100.

6. (with A. Di Nola, L. Leuştean) Boolean Products of BL-Algebras, *J. Math. Analysis Appl.*, 251 (2000), 106–131.

7. (with A. Iorgulescu) Pseudo-MV Algebras, *Multiple Valued Logic*, 6 (2001), 95–135.

8. (with A. Popescu) Non-Dual Fuzzy Connections, *Archiv Math. Logic*, 43 (2004), 1009–1039.

9. Bosbach States on Fuzzy Structures, *Soft Computing*, 8 (2004), 217–230.

10. (with D. Diaconescu) Tense Operators on MV-Algebras and Łukasiewicz-Moisil Algebras, *Fundamenta Informaticae*, 81 (2007), 379–408.

GHEORGHE, Marian

Born on February 2, 1953, in Bucharest, Romania.

Education: Batchelor degree in mathematics and computer science, University of Bucharest, Romania, 1972–1976.

PhD: University of Bucharest, Romania, 1991. Thesis title: *Formal Languages and Programming Languages*. Scientific advisor: Solomon Marcus.

Positions: Lecturer, University of Bucharest, Romania, 1992–1998. Associate Professor, University of Piteşti, Romania, 1998–2000. Lecturer, Senior Lecturer, Reader, at the University of Sheffield, 2000–2015. Professor, University of Bradford, 2015 – present.

Before 1992: Analyst at ITC, Bucharest, Romania, 1976–1980; Analyst and Researcher at CCUB, University of Bucharest, Romania (1980–1992).

Research areas: Computational models, such as formal languages, automata, unconventional computing, membrane computing, formal verification and testing, including model checking and model based testing, and software engineering and applications of computational models.

Main results:

Computational models have been core to most of the research activities. Various formal grammars – initial grammars, with valences, with apical growth, contextual grammars – have been studied for their computational power and properties of the generated languages. Some classes of grammars have been applied to the syntax analysis and parsing of programming languages. The properties of a special class of regular languages used in parallel parsing have been established in [a1]. X-machines, a general class of automata, have been investigated in connection with distributed grammar systems; the transitions of these machines have been associated with either regular or context-free rules and the power of these devices as translation mechanisms has been investigated. The parallel variant of this model, consisting of a set of communicating X-machines, has been proved to have the same behaviour as a standard X-machine [a2]. Membrane computing, a branch of natural computing, has been investigated for more than 15 years, after 2000, looking at different types of models, called P systems. In this context, a model, called population P systems, consisting of independent compartments that may dynamically create bonds and communicate, has been studied. The computational power of this model has been

investigated [a3]. A few more membrane computing models have been considered: a model derived from an important bacteria communication mechanism, quorum sensing, has been studied for its computational capabilities [a4] and a model based on a general communicating approach encountered in various computing paradigms has been introduced and studied [a5]. Some macro-constructs based on compositionality have been provided and used in this context [a5]. In an attempt to unify certain existing features of various membrane computing models, a new computational model, called kernel P system, has been considered. It captures basic type of rules – rewriting and communication, introducing a flexible way of creating bonds amongst compartments and allowing each compartment to define its own behaviour. The rules have guards that provide an additional control to selecting them. The model has been studied not only with respect to its computational power, but it has been linked with standard verification and testing approaches, allowing each model to be formally checked and its correctness being proved [a9].

Formal verification and testing has been considered for different models, especially state-based ones – finite-state machines and X-machines, but also for various types of P systems. A special class of P systems, called identifiable P systems, have been introduced and studied with respect to model-based testing, allowing to identify in a unique way from traces of execution the rules applied [a10]. A general method of deriving test sets from the formal specification of a P system has been constructed [a7]. A systematic approach on using formal verification for both qualitative and quantitative behaviour of biological systems has been established in [a8].

Software engineering and applications of computational models represent an opportunity to utilize different computational models for specifying the requirements or design of various engineering and biological systems [b4], build efficient simulation and verification approaches [b3, Chapter 1] and combine these models with efficient optimization algorithms. The last line of research has become very active in the membrane computing community, one of its initial developments – the use of such approach to solve a combinatorial problem by considering various membrane system structures and rules [a6], being very instrumental in this context.

Administrative positions: Head of the Verification and Testing Group, at Sheffield University, 2011–2014; Director of research of the School of Electrical Engineering and Computer Science, University of Bradford, 2015–present; Head of the Modelling, Testing and Verification Research Group (https://www.brad.ac.uk/ei/electrical–engineering–and–computer–science/research/modelling–testing–and–verification/) and co-director of the Computing Enterprise Centre (https://www.bradford.ac.uk/ei/electrical–engineering–and–computer–science/ bradford–computing–enterprise–centre/).

Membership to professional organizations: International Membrane Computing Society.

Honors, prizes, scientific distinctions: Best paper awards at IEEE Congress on Evolutionary Computation, 2007 and CiE, 2013. Award to "the researcher with the most numerous participations" and for „many ideas and papers in membrane computing" at WMC10, 2009.

PhD students: Francesco Bernardini (2006 – shortlisted as runner up for the BCS best PhD submission in 2006), Ioanna Stamatopoulou (2008), Ciprian Dragomir (2016), Mehmet E. Bakir (2018).

Books:

[b1] (with T. Bălănescu, I. Văduva, H. Georgescu, S. Gavrilă, L. Sofonea) *Programming in Pascal and Turbo Pascal*, 2 volumes, Technical Publishing House, 1992 (in Romanian).

[b2] (Editor) *Molecular Computation Models*, IGI Global, 2005.

[b3] (with P. Frisco, M.J. Pérez-Jiménez, eds.) *Applications of Membrane Computing in Systems and Synthetic Biology*, Springer, Berlin, 2014.

[b4] (with G. Zhang, M.J. Pérez-Jiménez) *Real-Life Applications with Membrane Computing*, Springer, Berlin, 2017.

Representative articles:

[a1] (with T. Bălănescu) A Note on *PF*(*k*) Parsable Languages, *Fundamenta Informaticae*, 24 (1991), 283–286.

[a2] (with T. Bălănescu, T. Cowling, H. Georgescu, M. Holcombe, C. Vertan) Communicating Stream X-Machines Are No More Than X-machines, *Journal of Universal Computer Science*, 5 (1999), 494–507.

[a3] (with F. Bernardini) Population P Systems, *Journal of Universal Computer Science*, 10 (2004), 509–539.

[a4] (with F. Bernardini, N. Krasnogor) Quorum Sensing P Systems, *Theoretical Computer Science*, 371 (2007), 20–33.

[a5] (with S. Verlan, F. Bernardini, M. Margenstern) Generalized Communicating P Systems, *Theoretical Computer Science*, 404 (2008), 170–184.

[a6] (with G. Zhang, C.-Z. Wu) A Quantum Inspired Evolutionary Algorithm Based on P Systems and Knapsack Problem, *Fundamenta Informaticae*, 87 (2008), 93–116.

[a7] (with F. Ipate, R. Lefticaru) Test Generation From P Systems Using Model Checking, *Journal of Logic and Algebraic Programming,* 79 (2010), 350–362.

[a8] (with S. Konur, C. Dragomir, L. Mierlă, F. Ipate, N. Krasnogor) Qualitative and Quantitative Analysis of Systems and Synthetic Biology Constructs Using P Systems, *ACS Synthetic Biology*, 4 (2014), 83–92.

[a9] (with R. Ceterchi, F. Ipate, S. Konur) Kernel P Systems Modelling, Testing and Verification, *International Conference on Membrane Computing*, 2016, 233–250.

[a10] (with F. Ipate, S. Konur) Testing Based on Identifiable P Systems Using Cover Automata and X-Machines, *Information Sciences*, 372 (2016), 565–578.

Further information: Some of the research presented above has been supported by research grants obtained from the European Community or research funding organisations from the UK or Romania. Some of them are presented at the links provided in the next section.

Personal web page and other related web pages:

– At the University of Bradford https://www.brad.ac.uk/ei/electrical–engineering–and–computer–science/staff–profiles/profile/?u=mgheorgh

– Google Scholar https://scholar.google.co.uk/citations?user=OnJzjuk AAAAJ &hl=en

– Research Gate https://www.researchgate.net/profile/Marian_Gheorghe

– At DBLP http://dblp.uni–trier.de/pers/hd/g/Gheorghe:Marian

GRAMATOVICI, Radu Valer

Born on February 14, 1970, in Bucharest, Romania.

Education: BSc in computer science, University of Bucharest, Faculty of Mathematics and Computer Science, 1989-1994. Master in computer science, University of Bucharest, Faculty of Mathematics and Computer Science, 1994–1995. Thesis title: *A Real-Time Interface in the Programming Process* (in Romanian). Supervisor: Solomon Marcus.

PhD in mathematics, University of Bucharest, Faculty of Mathematics and Computer Science, 1996–2001. Thesis title: *Mathematical Models in Syntax.* Scientific advisor: Solomon Marcus.

Scholarships, postdoc stages:

2004: Visiting Researcher at the Hungarian Academy of Sciences, Institute of Computer Sciences and Control, Budapest, Hungary.

November 2003: Visiting Researcher at Charles University, Department of Theoretical Computer Science and Mathematical Logic, Prague, Czech Republic.

January 2003 – September 2003: Visiting Researcher (NATO Scientific Committee Fellowship) to the Research Group on Mathematical Linguistics (GRLMC), Rovira i Virgili University, Tarragona, Spain.

October 6 – December 31, 2002: Visiting Researcher at Charles University, Department of Theoretical Computer Science and Mathematical Logic, Prague, Czech Republic.

Positions: 1994 – present: Teaching Assistant, Lecturer, Senior Lecturer, and Associate Professor) in Faculty of Mathematics and Computer Science, University of Bucharest, Computer Science Department.

Administrative positions: 2008 – present, vice-dean and dean of the Faculty of Mathematics and Computer Science.

Research areas: Formal languages, natural languages, computational linguistics, contextual multi-languages, computational languages, membrane computing.

Main results: Contributions to the theory of contextual grammars and languages. Applications of P systems to the generation of 2D laguages and to tilings of the plane.

Honors, prizes, scientific distinctions:

"Grigore C. Moisil" Prize of the Romanian Academy, 2009 (for 2007 book *Many-Sorted Languages*).

Books:

1. *Many-Sorted Languages*, Editura Universitară, Bucharest, 2007.

Representative articles:

1. Introducing the Operatorial Parser, *Proc. Developments in Language Theory II*, J. Dassow, G. Rozenberg, A. Salomaa, eds., World Scientific, Singapore, 1996, 466–471.

2. An Efficient Parser for a Class of Contextual Languages, *Fundamenta Informaticae*, 33 (1998), 211–238.

3. Contextual Multilanguages: A Learning Method, in *Rough Sets and Current Trends in Computing*, L. Polkowsky, A. Skowron, eds., *LNCS*, Springer, 1998, 107–111.

4. Shuffle-Based Multilanguages, *Grammars*, 2, 3 (1999), 201–210.

5. Bounded Deterministic Push-Down Automata, in *Recent Topics in Mathematical and Computational Linguistics*, C. Martín-Vide, Gh. Păun, eds., The publishing House of the Romanian Academy, Bucharest, 2000, 121–129.

6. (with R. Ceterchi, N. Jonoska, K.G. Subramanian), Tissue-like P Systems with Active Membranes for Picture Generation, *Fundamenta Informaticae*, 56 (2003), 311–328.

7. (with R. Ceterchi) On Total Contextual Grammars with Restricted Choice, *Fundamenta Informaticae*, 64, 1-4 (2005), 79–91.

8. (with G. Bel-Enguix, M. Cavalliere, R. Ceterchi, C. Martín-Vide) An Application of Dynamic P Systems: Generating Context-Free Languages, *Membrane Computing, Intern. Workshop*, Curtea de Argeş, *WMC* 2002, *LNCS* 2597, Springer, 2003, 90–106.

9. (with R. Ceterchi, N. Jonoska) Tiling Rectangular Pictures with P Systems, *Membrane Computing, International Workshop, WMC* 2003, Tarragona, Spain, *LNCS* 2933, Springer, 2004, 88–103.

10. (with R. Ceterchi, R.M. Ali, K.G.Subramanian) An Extension of External Contextual Array Grammars, *Annals of Bucharest University, Informatics Series*, 58 (2009), 65–75.

GRIGORAŞ, Gheorghe

Born on March 24, 1949, in Dărmăneşti, Bacău county, Romania.

Education: "Al.I. Cuza" University Iaşi, Faculty of Mathematics, „Maşini de Calcul" (1972)

PhD: "Al.I. Cuza" University Iaşi, 1981. Thesis title: *Contributions to the Theory of Automata Based on the Results of Graph Theory*. Scientific advisor: Irinel Drăgan.

Scholarships, postdoc stages:
Fulbright scholar, Cornell University USA, 1977.
Visiting professor, Lille University, France, 1993.
Tempus DECOR, University of Derby, UK, 1994.
Tempus DISCO, University Paris Sud – Orsay, France, 1996.
Tempus COMPTRAIN, University of Hamburg, Germany, 1997.
Tempus COMPTRAIN, University of Granada, Spain, 1998.
Tempus COMPTRAIN, University of Aalborg, Danemark, 1999.
Erasmus Program, University of Granada, Spain, 2003.

Positions:
Instructor (1972–1981), Lecturer (1981–1990), Associate Professor (1990–2005), Professor (2005–2014), Computer Science Department, "Al.I. Cuza" University Iaşi.

Research areas: Formal languages, compilers, programming languages, functional programming, algebraic specification and verification.

Main results:
In my PhD thesis a series of controllability problems were studied in some classes of finite automata. Some classes of graphs and automata were defined, for which specific problems were described and proved to be included in the **NP**-complete problems class. Also, the class of strictly reversible automata was introduced and their algebraic properties were studied. Important results have been obtained in relation to the automata and other structures' isomorphism problem using a technique similar to that of Hartmanis and Berman on **NP**-complete problems [10].

Subsequent research is in the field of formal languages with applications to compiler design. Results have been obtained in generating context-sensitive languages using attribute grammars, a dual parsing algorithm of LR type has been described

using the viable suffix notion for a propositional form. Some results are related to parallel scanning and parsing techniques in compilers and to the functional approach of scanning and parsing processes.

An important project I was involved is CIRC – an automated circular coinductive prover implemented as an extension of Maude. The main engine of CIRC consists of a set of rewriting rules implementing the circularity principle. Adding new capabilities implemented also by rewriting rules can increase the power of the prover. In [6] we prove the correctness of the coinductive prover and show how rewriting strategies, expressed as regular expressions, can be used for specifying proof tactics for CIRC. We illustrate the strength of the method by defining a proof tactic combining the circular coinduction with a particular form of simplification for proving the equivalence of context-free processes.

Also in [3] we use CIRC for proving properties of systems involving infinite amount of information: associativity, commutativity, identity and/or idempotency.

In [1] we show how a stratified graph can generate natural language constructions by acting as a transition network with arc labels referring to word categories and word forms. In this representation, each grammar rule can be transposed in a sequence of labelled paths. The generation mechanism defined by means of stratified graph uses a bottom-up approach. The advantage of this generation mechanism relies on its bottom-up approach characteristic: this mechanism never suggests constructions that are not correct based on the involved representation elements.

Administrative positions:

Vice dean (1990–1992), dean (1992–1996), vice-dean (1996–2004), dean (2004–2012), Faculty of Computer Science, "Al.I. Cuza" University of Iaşi.

Editorial boards: *Acta Universitatis Sapientiae, Informatica.*

Membership to professional organizations: American Mathematical Society, Association for Computing Machinery.

Books:

1. *Construcţia compilatoarelor. Algoritmi fundamentali*, Editura Universităţii "Al.I. Cuza" Iaşi, 2005 (274 pages).
2. *Programarea calculatoarelor – Partea I: Fundamente,* Editura "Spiru Haret", Iaşi, 1999 (282 pages).

Representative articles:

1. (with V. Negru, D. Danciulescu) Natural Language Agreement in the Generation Mechanism Based on Stratified Graphs, *BCI,* 36 (2015), 1–36.
2. (with R. Mereuţă) Parsing K Definitions, *Electr. Notes Theor. Comput. Sci.*, 304 (2014), 151–166.

3. (with D. Lucanu, G. Caltais, E.-I. Goriac) Automated Proving of the Behavioral Attributes, *BCI*, 2009, 33–38 (Sept 2009, Thessaloniki).

4. (with E.-I. Goriac, G. Caltais, D. Lucanu, O. Andrei) Patterns for Maude Metalanguage Applications, *Electronic Notes in Theoretical Computer Science*, 238 (2009), 121–138.

5. (with G. Caltais, E.-I. Goriac, D. Lucanu) A Rewrite Stack Machine for ROC!, *Proc. 10th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing* (*SYNASC* 2008), Timişoara, IEEE Computer Society, 2008, 85–91.

6. (with D. Lucanu, G. Roşu) Regular Strategies as Proof Tactics for CIRC Prover, *Electronic Notes in Theoretical Computer Science*, 204 (2008), 83–98.

7. (with D. Lucanu) On Hidden Algebra Semantics of Object Oriented Languages, *Sci. Ann. "Al.I. Cuza" Univ.,* 14 (2004), 51–68.

8. (with Ş. Andrei, W.-N. Chin) Co-Determinism and Unambiguity of Automata Accepting Finite or Infinite Words, *Sci. Ann. "Al.I. Cuza" Univ*., 14 (2004), 1–11.

9. (with Ş. Andrei, M. Kudlek, C. Masalagiu) On the Complexity of Propositional Calculus Formulae, *Sci. Ann. Cuza Univ.*, 10 (2001), 27– 43.

10. On the Isomorphism-Complete Problems and Polynomial Time Isomorphism, *Acta Cybern.*, 5, 2 (1981), 135–142.

GRIGORESCU, Elena

Born in Piatra Neamţ, Romania.

Education: National College "Petru Rareş" (1996–2000); Bard College (2000–2004); Massachusetts Institute of Technology (2004–2006).

PhD: Massachusetts Institute of Technology, 2010. Thesis title: *Symmetries in Algebraic Property Testing.* Scientific advisor: Madhu Sudan.

Scholarships, postdoc stages: Computing Innovations Fellow, Georgia Institute of Technology, 2010–2012.

Positions: Purdue University, Assistant Professor of Computer Science, 2012 – present.

Research areas: Sublinear algorithms, coding theory, complexity theory, learning theory.

Main results: Proved hardness results for decoding Reed-Solomon codes; introduced a framework for proving lower bounds on computational problems over distributions; initiated a systematic study of learning distributions in distributed settings and under communication constraints.

Membership to professional organizations: ACM, IEEE.

PhD students: Venkata Gandikota (2017), Samson Zhou (2018).

Representative articles:

1. (with C. Peikert) List-Decoding Barnes-Wall Lattices, *Computational Complexity*, 26, 2 (2017), 365–392.
2. (with V. Feldman, L. Reyzin, S. Srinivas Vempala, Y. Xiao) Statistical Algorithms and a Lower Bound for Detecting Planted Cliques, *J. ACM*, 64, 2 (2017), 8:1–8:37.
3. (with K. Chandrasekaran, V. Gandikota) Deciding Orthogonality in Construction–A Lattices, *SIAM J. Discrete Math*., 31, 2 (2017), 1244–1262.
4. (with A. Bhattacharyya, A. Shapira) A Unified Framework for Testing Linear-Invariant Properties, *Random Struct. Algorithms*, 46, 2 (2015), 232–260.

5. (with P. Berman, A. Bhattacharyya, S. Raskhodnikova, D.P. Woodruff, G. Yaroslavtsev) Steiner Transitive-Closure Spanners of Low-Dimensional Posets, *Combinatorica*, 34, 3 (2014), 255–277.

6. (with V. Chen, R. de Wolf) Error-Correcting Data Structures, *SIAM J. Comput.*, 42, 1 (2013), 84–111.

7. (with A. Bhattacharyya, K. Jung, S. Raskhodnikova, D.P. Woodruff) Transitive-Closure Spanners, *SIAM J. Comput*., 41, 6 (2012), 1380–1425.

8. (with T. Kaufman, M. Sudan) Succinct Representation of Codes with Applications to Testing, *SIAM J. Discrete Math.*, 26, 4 (2012), 1618–1634.

Personal web page: https://www.cs.purdue.edu/homes/egrigore/

IFTENE, Adrian

Born on February 26, 1973, in Bârlad, Vaslui county, Romania.

Education:
1987–1991: "Gheorghe Roşca Codreanu" College (math–physics profile), Bârlad, Vaslui.
1991–1996: Faculty of Computer Science of "Al.I. Cuza" University of Iaşi, bachelor.
2003–2005: Faculty of Computer Science of "Al.I. Cuza" University of Iaşi, master in computational optimization.

PhD: Doctoral School of Faculty of Computer Science of "Al.I. Cuza" University of Iaşi, 2005–2009. Thesis title: *Textual Entailment*. Scientific advisor: Dan Cristea.

Scholarships, postdoc stages: Scholarship during the PhD studies supported by Siemens Iaşi, between 2006 and 2009. Postdoc stages at Faculty of Computer Science of "Al.I. Cuza" University of Iaşi, program POSDRU/89/1.5/S/49944 – Developing innovation capacity and increasing research impact through post-doctoral programs, project title "Using Textual Entailment in Internet Surveillance", between 2010 and 2012.

Positions: Analyst Programmer at FEPA SA Bârlad Factory between September 1996 – November 2001 and at Cigarettes Factory, Iaşi, between November 2001 – November 2002. Software Engineering, Team Leader at SC MIND SA Iaşi, IT Industry, November 2002 – April 2005.
Research Assistant (2005–2008), Teaching Assistant (2008–2011), Lecturer (2011–2013), Associate Professor (2013–present) at Faculty of Computer Science of "Al.I. Cuza" University of Iaşi.

Research areas: Processing of natural language (recognition of name-type entities and sentiment analysis, question-answer systems, information retrieval, Internet surveillance), both in Romanian and English. Experience in analyzing social networks (Twitter, Facebook, MySpace, Flickr), building user profiles and credibility of resources. Until now, I have been involved in 24 research projects (12 international and 12 national). In three projects (MUCKE, Compet IT & C and EVALSYS), I was coordinator and responsible for UAIC team and in the STAGES project I was scientific advisor.

Main results are in the area of semantic similarities between texts. Texts are represented as semantic trees and then similarity is calculated using mapping between associated trees. In order to map nodes from trees external resources (WordNet, DIRT, Wikipedia, DBpedia, etc.) are used. Another direction is related to the promoting of Romanian language, creation of textual resources and tools adapted to Romanian language. These resources were used in international evaluation campaigns like CLEF, RTE, TAC, AVE, etc.

Administrative positions: Team leader at SC MIND SA Software between 2003 and 2005. Dean of the Faculty of Computer Science of "A.I. Cuza" University of Iaşi, from 2012 until present.

Editorial boards: *Romanian Journal of Human-Computer Interaction*, starting from 2015.

Membership to professional organizations: Steering committee for ELIAS (Evaluating Information Access Systems), from 2011; European Network Association, from 2012.

Representative articles:

1. (with M.Ş. Dudu, A.R. Miron) Scalable System for Opinion Mining on Twitter Data. Dynamic Visualization for Data Related to Refugees' Crisis and to Terrorist Attacks, *Proc. 26th International Conference on Information Systems Development*, Larnaca, Cyprus, September 6–8, 2017.
2. (with A.M. Băboi) Using Semantic Resources in Image Retrieval, *Proc. 20th International Conference on Knowledge Based and Intelligent Information and Engineering Systems*, KES2016, 5–7 September 2016, York, United Kingdom, Elsevier, vol. 96, 436–445.
3. (with A. Balahur–Dobrescu) Hypothesis Transformation and Semantic Variability Rules Used in Recognizing Textual Entailment, *Proc. ACL–PASCAL Workshop on Textual Entailment and Paraphrasing*, 28–29 June, 2007, Prague, Czech Republic,125–130.

Further information:

I have coordinated students and I was directly involved in evaluation campaigns from RTE (Recognition textual entailment), CLEF (Conference and Labs of the Evaluation Forum), AVE (Answer validation exercise), TAC (Text analysis conference).

Keynote speaker: SPED 2017: The 9th Conference on Speech Technology and Human-Computer Dialogue, Bucharest, Romania.

Conference chair: at EcoMedia2016: Innovative strategies in educational activities, Iaşi, Romania, and at RoCHI2016: International Conference on Human–Computer Interaction, Iaşi, Romania.

Conference co-chair: MFOI: Conference on Mathematical Foundations of Informatics, Chişinău, Republic of Moldova, starting with 2015.

Tutorial chair: ECIR 2015: European Conference on Information Retrieval, Vienna.

Workshop chair of LRTIA 2011: Workshop on Language Resources and Tools with Industrial Applications, Conjoint with EUROLAN 2011 Summer School, Cluj-Napoca.

Program Committee member: RoCHI: International Conference on Human–Computer Interaction, from 2012 until in present, INISTA: IEEE International Conference on INnovations in Intelligent SysTems and Applications, starting with 2016, RANLP: Recent advances in Natural Language Processing, Varna, Bulgaria, starting with 2015, SemEval2017: SemEval–2017 – International Workshop on Semantic Evaluation, Vancouver, Canada, CSCS: The International Conference on Control Systems and Computer Science, starting with 2017, BCI: Balkan Conference on Informatics, starting with 2015, ConsILR: Conference on Linguistic Resources and Tools for Processing the Romanian Language, starting with 2006, Program committee member: WOKB 2015: International Workshop on Ontologies and Knowledge Bases, Craiova, IMRSMCA'12: International Workshop on Machine Reading for Social Media Content Analytics, Macau, KEPT 2013: Knowledge Engineering: Principles and Techniques Conference, Cluj-Napoca.

Organizing Committee member: Eurolan: Summer School on Natural Language Processing starting with 2007, BringITon! starting with 2012, IIT 25: Anniversary Workshop: Written and Spoken Romanian Language in The Context of New Information Technologies. Achievements and Prospects, Iaşi, Romania.

Personal web page https://profs.info.uaic.ro/~adiftene/

ILIE, Lucian

Born in 1970, in Târgovişte, Romania.

Education: Faculty of Mathematics and Computer Science of University of Bucharest, B.Sc. – 1984, Master – 1985.

PhD: University of Turku, Finland, 1998. Thesis title: *Decision Problems on Orders of Words.* Scientific advisor: Arto Salomaa.

Scholarships, postdoc stages: Postdoctoral fellow, Turku Centre for Computer Science, Turku, Finland, 1999.

Positions:
Assistant Professor (2000–2005), Associate Professor (2005–2012), Full Professor (2012 – present), Computer Science Department, University of Western Ontario, London, Ontario, Canada.

Research areas: Bioinformatics algorithms and software, string algorithms, combinatorics on strings, formal languages.

Main results:
Some of the best bioinformatics tools and algorithms for several fundamental problems: sequence alignment: the best algorithm for computing multiple spaced seeds (SpEED), maximal exact match computation (E–MEM), error correction is DNA sequencing data (HiTEC, RACER), setting the standard for error correction evaluation, DNA read mapping, or genome resequencing (SHRiMP2).

String algorithms and combinatorics: practically solving the "runs" conjecture, optimal computation of Lempel-Ziv factorizations, optimal computation of all repetitions, a very simple proof of the number of distinct squares in a string.

Formal languages: introduced follow automata, some of the best epsilon-free nondeterministic finite automata.

Administrative positions: Graduate chair, Computer Science Department, University of Western Ontario, Canada.

Editorial boards: *BMC Research Notes.*

Membership to professional organizations: ISCB (International Society for Computational Biology), ACM, SIGACT (Association for Computing Machinery, Special Interest Group on Algorithms and Computation Theory), IEEE, Computer Society (Institute of Electrical and Electronics Engineers, Computer Society), IACR (International Association for Cryptologic Research), EATCS (European Association for Theoretical Computer Science).

Honors, prizes, scientific distinctions: Faculty Scholar Award, University of Western Ontario, 2011; Awards of Excellence, University of Western Ontario, 2009; CNRS visiting professor, Université Paris–Est, France, 2006–2007; Humboldt fellowship, Magdeburg, Germany, 2000–2001.

PhD students: Nilesh Khiste (2018), Michael Molnar (2018), Bahlul Haider (2012), Liviu Tinta (2009), Sorin Constantinescu (2007).

Representative articles:

1. (with N. Khiste), E–MEM: Efficient Computation of Maximal Exact Matches for Very Large Genomes, *Bioinformatics*, 31, 4 (2015), 509–514.
2. (with M. Molnar) Correcting Illumina Data, *Briefings in Bioinformatics*, 16, 4 (2014), 588–599.
3. (with M. Molnar) RACER: Rapid and Accurate Correction of Errors in Reads, *Bioinformatics*, 29, 19 (2013), 2490–2493.
4. (with M. David, M. Dzamba, D. Lister, M. Brudno) SHRiMP2: Sensitive Yet Practical Short Read Mapping, *Bioinformatics*, 27, 7 (2011), 1011–1012.
5. (with F. Fazayeli, S. Ilie) HiTEC: Accurate Error Correction in High-Throughput Sequencing Data, *Bioinformatics*, 27, 3 (2011), 295–302.
6. (with M. Crochemore) Computing Longest Previous Factor in Linear Time and Applications, *Information Processing Letters*, 106 (2008), 75–80.
7. (with M. Crochemore) Maximal Repetitions in Strings, *Journal of Computer and System Sciences*, 74 (2008), 796–807.
8. (with S. Ilie) Multiple Spaced Seeds for Homology Search, *Bioinformatics,* 23, 22 (2007), 2969–2977.
9. A Simple Proof That a Word of Length n Has at Most $2n$ Distinct Squares, *Journal of Combinatorial Theory, Series A*, 112, 1 (2005), 163–164.
10. (with S. Yu) Follow Automata, *Information and Computation*, 186, 1 (2003), 140–162.

Personal web page: http://www.csd.uwo.ca/faculty/ilie/

IONESCU, Armand-Mihai

Born on June 13, 1979, in Curtea de Argeş, Romania.

Education:

Faculty of Mathematics and Computer Science of Bucharest University (1998–2003).

Executive Master in business administration, Vlerick Business School, Brusseles, Belgium (2014–2015).

PhD: Rovira i Virgili University, Tarragona, Spain, 2008. Thesis title: *Membrane Computing: Traces, Neural Inspired Models, Controls: Getting Computational Inspiration from Biology.* Scientific advisors: Takashi Yokomori and Victor Mitrana.

Scholarships: Formacion de Profesorado Universitario – Ministry of Education, Sport and Culture, Spain (2004–2008).

University of Cambridge, Computer Laboratory, United Kigdom, 2007 (3 months), Microsoft Research – COSBI, Trento, Italy, 2006 (4 months), Waseda University, Japan, 2005 (3 months).

Positions:

European Research Council Executive Agency, Belgium, Project Manager (2015 – present).

Phoenix Investor Relations, Belgium, Partner (2009–2015).

University of Piteşti, Romania, Assistant Professor (2013 – present).

Research areas: P systems/membrane computing, formal languages.

Books:

1. *Membrane Computing: Traces, Neural Inspired Models, Controls: Getting Computational Inspiration from Biology*, VDM Verlag Dr. Müller, Sarbrüchen, 2009.

Representative articles:

1. (with Gh. Păun, T. Yokomori) Spiking Neural P Systems, *Fundamenta Informaticae*, 71 (2006), 1–30.

2. (with D. Sburlan) Some Applications of Spiking Neural P Systems, *Computing and Informatics*, 27 (2008), 515–528.

3. (with M. Cavaliere, O.H. Ibarra, Gh. Păun, Ö. Egecioglu, S. Woodworth) Asynchronous Spiking Neural P Systems, *Theoretical Computer Science*, 410, 24–25 (2009), 2352–2364.

4. (with A. Păun, Gh. Păun, M.J. Pérez-Jiménez) Computing with Spiking Neural P Systems: Traces and Small Universal Systems, *DNA Computing 2006*, 1–16.

5. (with H. Chen, A. Păun, Gh. Păun) On Trace Languages Generated by (Small) Spiking Neural P Systems, *Theoretical Computer Science*, 682 (2017), 57–66.

6. (with C. Martín-Vide, A. Păun, Gh. Păun) Unexpected Universality Results for Three Clases of P Systems with Symport/Antiport, *Natural Computing*, 2, 4 (2003), 337–348.

7. (with C. Martín-Vide, Gh. Păun) P Systems with Symport/Antiport Rules: The Traces of Objects, *Grammars*, 5 (2002), 65–79.

8. (with T.-O. Ishdorj) Replicative-Distribution Rules in P Systems with Active Membranes, *Proc. First Intern. Coll. Theoretical Aspects of Computing*, Guiyang, China, Sept. 2004., *LNCS* 4705, Springer, 2005, 69–84.

9. (with T.-O. Ishdorj) Boolean Circuits and a DNA Algorithm in Membrane Computing, *Proc. 6th Workshop on Membrane Computing*, Vienna, 2005, *LNCS* 3850, Springer, 2006, 272–291.

10. (with S. Sburlan) P Systems with Adjoining Controlled Communication Rules, *Proc. 16th Intern. Symp. FCT*, Budapest, Hungary, August 2007.

IORGULESCU, Afrodita

Born on March 22, 1946, in Cluj, Romania.

Education: University of Bucharest, Faculty of Mathematics and Mechanics, 1964–1969

PhD: University of Bucharest, 1984. Thesis title: *Algebre Łukasiewicz–Moisil* (1+ θ)*–valenţe cu negaţie.* Scientific advisor: Sergiu Rudeanu.

Positions: Academy of Economic Studies (ASE) from Bucharest: 1969–2011, including University of Constantine, Algeria (1973–1975) and l'ISCAE, Casablanca, Morocco (1976–1978); Professor since 1993.

Research areas: Algebras of logic.

Main results:

In the PhD thesis, I have generalized the *n*-valued Łukasiewicz-Moisil algebras to the θ type of order. Between 1995–1998, I studied the MV algebras (Multiple Valued algebras) and I established connections between the *n*-valued Łukasiewicz-Moisil algebras and the *n*-valued MV algebras (MVn).

Between 1998–2002, with George Georgescu from the University of Bucharest, we have generalized to the non-commutative case, the MV algebras, the BL algebras and the BCK algebras, introducing the pseudo-MV algebras, the pseudo-BL algebras and the pseudo-BCK algebras, respectively. In 2001, with Paul Flondor and George Georgescu, we have introduced and studied the pseudo-t-norms, a generalization to the non-commutative case of the t-norms.

In 2002, I have developed the theory of BCK algebras, establishing connections with the well-known algebras of logic: the residuated lattices, the BL, MV and Wajsberg algebras. In 2003, I have developed the theory of BL algebras, introducing many new algebras as particular cases of residuated lattices, thus opening a very large area of research. In 2004–2006, I have generalized to the non-commutative case the results from 2003; all these results can be found in the monograph *Algebras of Logic as BCK Algebras*, published in 2008.

In 2009–2011, I have introduced and studied the implicative-group, a term equivalent definition of the group coming from algebras of logic. In 2011–2013, I have introduced new generalizations of BCI, BCK and Hilbert algebras. In 2013–2015, I have introduced the theory of quasi-algebras (as a generalization of the theory of (regular) algebras of logic) coming from quantum computing; the first

part is published. In 2016–2018, I have introduced a new theory, of quasi-m algebras vs. the theory of quasi-pseudo-algebras (in non-commutative case) and I have introduced and studied new generalizations of the groups and of the implicative-groups, all these presented in the monograph *Implicative-Groups vs. Groups and Generalizations,* 2018.

Editorial boards: *Journal of Multiple-Valued Logic and Soft Computing*, since 2006

Membership to professional organizations:

– INFOREC (from ASE), 1990–2011.

– Group of Logic and Universal Algebra (from University of Bucharest) – since 1990.

– Romanian Society of Mathematical Sciences – since 1996.

– Grupul pentru Salvarea Roşiei Montane (from ASE), 2002–2011.

– Member CNFIS (1998–2003), reviewer CNCSIS (2004–2011), member of National Register of Experts of CNCSIS (2005–2011).

Honors, prizes, scientific distinctions:

"Gheorghe Lazăr" Prize of Romanian Academy, 2002.

"N.N. Constantinescu" Award of A.S.E., 2005.

Award of Excellance of Romanian Society of Mathematical Sciences, 2013.

Books:

1. *Algebras of Logic as BCK Algebras*, Academy of Economic Studies Press (Editura ASE), Bucharest, 2008 (569 pages).

2. (with G. Georgescu) *Logică matematică*, Academy of Economic Studies Press (Editura ASE, Colecția Informatică), Bucharest, 2010 (299 pages).

3. *Implicative-Groups vs. Groups and Generalizations*, Editura MATRIX ROM, 2018 (735 pages).

Representative articles:

1. On the Construction of Three-Valued Łukasiewicz-Moisil Algebras, *Discrete Mathematics*, 48 (1984), 213–227.

2. (with G. Georgescu) Pseudo-MV Algebras, *Multiple-Valued Logic*, 6, 1–2 (2001), 95–135.

3. Connections Between MV*n*-Algebras and *n*-Valued Łukasiewicz-Moisil Algebras, Part I, *Discrete Mathematics*, 181 (1998), 155–177.

4. Connections Between MV*n*-Algebras and n–Valued Łukasiewicz-Moisil Algebras, Part II, *Discrete Mathematics*, 202 (1999), 113–134.

5. Connections Between MV*n*-Algebras and *n*-Valued Łukasiewicz-Moisil Algebras, Part IV, *Journal of Universal Computer Science*, 6, 1 (2000), 139–154.

6. (with P. Flondor, G. Georgescu) Pseudo-t-Norms and Pseudo-BL Algebras, *Soft Computing*, 5, 5 (2001), 355–371.

7. (with G. Georgescu) Pseudo-BCK Algebras: An Extension of BCK Algebras, *Proceedings of DMTCS'01: Combinatorics, Computability and Logic* (C.S. Calude, M.J. Dinneen, S. Sburlan, eds.), Springer, London, 2001, 97–114.

8. (with A. Di Nola, G. Georgescu) Pseudo-BL Algebras: Parts I, II, *Multiple-Valued Logi*c, 8, 5–6 (2002), 673–714, 717–750.

9. Quasi-Algebras vs. Regular Algebras, Part I, *Scientific Annals of Computer Science*, 25, 1 (2015), 1–43.

10. New Generalizations of BCI, BCK and Hilbert Algebras, Parts I, II, *J. of Mult.-Valued Logic and Soft Computing*, 27, 4 (2016), 353–406 and 407–456.

Further information: Reviewer at *Zentralblatt für Mathematik* (since 2004) and *Mathematical Reviews* (since 2006), reviewer at many journals.

IPATE, Florentin Eugen

Born on December 4, 1967, in Constanța, Romania.

Education: BSc in computer science and automatic control, "Politehnica" University of Bucharest, Romania (1986–1991).

MSc in software systems technology (with Distinction) University of Sheffield, UK (1991–1992).

PhD in computer science, University of Sheffield, UK, 1995. Thesis title: *Theory of X-Machines with Applications in Specification and Testing.* Scientific advisor: Mike Holcombe.

Scholarships, postdoc stages:

PhD Research Scholarship awarded by the University of Sheffield, 1992–1995.

1995–1996: Postdoctoral Research Grant, Fretwell-Downing Data Systems/ University of Sheffield, UK.

Positions:

2002–present: Professor of computer science, University of Piteşti (2002–2012) and University of Bucharest (since 2012).

1998–2002: Associate Professor of computer science, Romanian-American University (1998–2001) and University of Piteşti (2001–2002).

1996–1998: Lecturer in computer science, Romanian-American University.

Research areas: Formal methods, software testing, model based testing, formal verification, membrane computing.

Main results:

– developed powerful model based testing techniques with high industrial impact.

– developed and promoted (Communicating) X-machines as a modelling language.

– developed very powerful test generation methods from (deterministic, non-deterministic, communicating) stream X-machines.

– developed an approach to testing various classes of P systems, based on a combination of coverage criteria, state based techniques, model checking and mutation analysis.

– proposed a method for learning approximate state-based models (called cover automata), which are then used as basis for test generation.

Editorial boards: *ISRN Software Engineering; International Journal on Advances in Systems and Measurements.*

Honors, prizes, scientific distinctions:

Honorary invited professor of the Xihua University, Chengudu, China, 2010.

In Hoc Signo Vinces Prize for research and publications awarded by CNCSIS (National Research Council for Higher Education), 2002.

COPYRO Publishing Prize for Computer Science, 2000.

PhD students: Raluca Lefticaru (2005–2011), Adrian Ţurcanu (2010–2013).

Books:

1. (with M. Holcombe) *Correct Systems: Building a Business Process Solution*, Springer, London, 1998.
2. *Object-Oriented Modelling Using UML*, University of Piteşti Publishing House, 2001 (in Romanian).
3. (with M. Popescu) *Database Applications in Oracle8 and Forms6*, ALL Publishing House, Bucharest, 2000 (in Romanian).
4. *Principles of Expert Systems*, Sylvi Publishing House, Bucharest 1998 (in Romanian).

Representative articles:

1. (with M. Gheorghe, S. Konur) Testing Based on Identifiable P Systems Using Cover Automata and X-Machines, *Information Sciences,* 372 (2016), 565–578.
2. (with S. Konur, M. Gheorghe, C. Dragomir, L. Mierlă, N Krasnogor) Qualitative and Quantitative Analysis of Systems and Synthetic Biology Constructs Using P Systems, *ACS Synthetic Biology*, 4, 1 (2015), 83–92.
3. Learning Finite Cover Automata from Queries, *Journal of Computer and System Sciences*, 78, 1 (2012), 221–244.
4. (with M. Gheorghe, R. Lefticaru) Test Generation from P Systems Using Model Checking, *Journal of Logic and Algebraic Programming*, 79, 6 (2010), 350–362.
5. Bounded Sequence Testing from Deterministic Finite State Machines, *Theoretical Computer Science*, 411, 16–18 (2010), 1770–1784.
6. Testing Against a Non-Controllable Stream X-Machine Using State Counting, *Theoretical Computer Science*, 353, 1–3 (2006), 291–316.
7. (with M. Holcombe) A Method for Refining and Testing Generalised Machine Specifications, *International Journal of Computer Mathematics*, 68 (1998), 197–219.
8. (with M. Holcombe) Specification and Testing Using Generalized Machines: A Presentation and a Case Study, *Software Testing, Verification and Reliability*, 8 (1998), 61–81.
9. (with M. Holcombe) An Integration Testing Method That Is Proved to Find All Faults, *International Journal of Computer Mathematics*, 63 (1997), 159–178.

Personal web page: http://www.ifsoft.ro/~florentin.ipate/

ISTRAIL, Sorin

Born on October 19, 1952, in Târgu-Neamţ, Romania.

Education: "Al.I. Cuza" University of Iaşi, 1971–1975.

PhD: University of Bucharest, 1976–1979. Thesis title: *Context-Sensitive Languages with Applications to Number Theory and Program Semantics.* Scientific advisors: Solomon Marcus and Sergiu Rudeanu.

Scholarships, postdoc stages:

Postdoc in computer science, Massachusetts Institute of Technology, 1988–1992, advisor professor Albert Meyer.

Postoc in molecular biology, California Institute of Technology, 2003–2005, advisor professor Eric Davidson.

Positions:

Researcher, "Al.I. Cuza" University of Iaşi, Computer Center, and "Al. Myller" Mathematical Institute (Seminarul Matematic), 1980–1983.

Assistant Professor of computer science, Wesleyan University, 1984–1992.

Visiting Scientist, Massachussets Institute of Technology, Laboratory for Computer Science, 1984–1992.

Member, Senior Member, Principal Senior Member of the technical staff, Founder and Project Leader, Computational Biology Project, Sandia National Laboratories, 1992–2000.

Senior Director of Information Research, Celera Genomics, 2000–2005.

Visiting Senior Scientist, Division of Biology and Biological Engineering, California Institute of Technology, 2000–2015.

Professor of computer science, Brown University, 2005 – present.

Julie Nguyen Brown, Professor of Computational and Mathematical Sciences, Brown University, 2006 – present.

Research areas:

Computational molecular biology: Haplotype assembly and genome assembly, the regulatory genome and gene regulatory networks, protein folding, genomic privacy.

Algorithms and theoretical computer science: graph theory, combinatorics, probabilistic methods, spectral graph theory, hyperbolic graphs theory, mathematical economics methods, especially voting theory algorithms.

Statistical physics and computational complexity: the Ising model, three dimensional statistical models.

Main results:

The selection criterion for the 8 problems and results listed below is based on my research work on them for at least 10 years (a few, by now, for more than 30 years):

Problem: *Universal traversal sequences* (UTS).

Results: First UTS construction of 2-regular graphs in log-space, *STOC* 1988, *FOCS* 1990. This problem is one of most studied problems in computational complexity theory. Our result answers an open question of Aleluias, Karp, Lipton, Lovasz, Rackoff, *FOCS* 1979.

Problem: *Axiomatizing the operational semantics of concurrency models.*

Results: Our work with Albert Meyer (MIT), *JACM* 1995, shows that "Bisimulation can't be traced", that is, the axiomatic separation of Milner's Calculus of Communicating Systems (CCS) and Hoare's theory of Communicating Sequential Processes (CSP).

Problem: *The protein folding problem.*

Results: The first lattice protein folding algorithms in the literature with mathematically guaranteed error bounds, *STOC* 1995, *RECOMB* 1997. This problem is a grand challenge problem of fundamental importance in biochemistry, biophysics, biotechnology.

Problem: *The search for analytical closed forms partition functions for one of statistical mechanics' most studied models, the Ising model of ferromagnetism.*

Results: The 3D Ising Model is **NP**-complete for every 3D-model, *STOC* 2000. This result resoves in the negative a 50+ years old open problem in statistical mechanics.

Problem: *Logic functions of the genomic cis-regulatory code.*

Results: Our work with Eric Davidson (Caltech) and collaboration over 15 years made important contributions to constructing the sea urchin genome and transcriptome assemblies, and developing a mathematical information processing model for the Regulatory Genome. *PNAS* 2005, Science 2006, Dev Biol 2007

Problem: *The unification of linkage disequilibrium (LD) measures in statistical genetics.*

Results: Work with my students Ryan Tarpine and Fumei Lam developed a new LD measure, *directed inforamtiveness,* that satisfies desiderata unfulfilled simultaneously before, stated in the statistical genetics literature addressing: the curse of the pairwise, the conservative extension to multi markers and the independence of allele frequencies caveats for all LD measures.

Problem: *The haplotype assembly problem.*

Results: Work with my student Derek Aguiar develpoed a suite of genomics tools HAPCOMPASS for the haplotype assembly problem, *Journal of Computational Biology,* 2012. This method creates genome assemblies separating the mother–father chromosomes in two different assemblies. This genomic software tool is a leading tool for haplotype assembly in use by many academic, private industry, government research labs, biological and disease control centers over the world.

Problem: *The maximum likelihood (ML) haplotype phasing problem.*

Results: Work with my student Doug McErlean developed a new theorem and algorithm for "Big Data ML" optimizations, building on a maximum-likelyhood homomorphism and speedup based on symmetries of the haplotype phasing likelihood polynomial.

Administrative positions:

Senior Director of Informatics Research, Celera Genomics, 2000–2005.

Director, Center for Computational Molecular Biology, Brown University 2006–2011.

Director, International Affairs, and co-founder, "Grigore Mosil Institute for Computer Science and Applications", "Al.I. Cuza" University Iaşi. The Institute was co-founded together with professors Solomon Marcus and Henri Luchian. Professors Kenneth Arrow (Stanford University and Nobel Laureate in Economics) and John Conway (Princeton University) gave the inaugural Grigore Moisil Distinguished Lectures of the Institute.

Editorial boards: *Journal of Computational Biology* (Mary-Ann Liebert Publishers, editor-in-chief); Lecture Notes in Bioinformatics Book Series (Springer-Nature); *Computational Molecular Biology Book Series* (MIT Press).

Membership to professional organizations: Association for Computing Machinery, Mathematical Association of America.

Honors, prizes, scientific distinctions:

1995: Sandia National Laboratory Award for Excellence: "First protein folding algorithm with mathematical guaranteed error bounds".

2000: In 2000, in the spirit of David Hilbert's list of mathematics challenges for the 20th Century, the US National Science Foundation, ACM/SIGACT, DIMACS and SIAM held a "Workshop on Challenges for Theoretical Computer Science at the Beginning of the 21st Century". One of the challenges is based on my work: *Computational Statistical Mechanics* (*STOC* 2000).

2001: U.S. Department of Energy Awards for outstanding achievements in the first 25 years. Our work at Sandia National Labs on the computational complexity of the three-dimensional Ising Model was ranked in the top 10 most distinguished achievements in "Advanced Scientific Computing Research" and in the top 100 most important discoveries of the U.S. Department of Energy

2002: Manager of the Celera sub-team of the ClearForrest–Celera team that won the 2002 ACM Knowledge Discovery and Datamining Cup, the *ACM KDD Cup*, arguably, the top International Machine Learning Competition. Theme: automatic genomic annotation of a Drosophila genome target region, matching the human-expert genomic annotation.

2003: Applied Biosystems/Celera Genomics Science Fellow, Informatics, "Best in Class" – highest distinction for individual technical contributions in Applied Biosystems; one of six Science Fellows, in a company of 800 scientists and 5500 employees.

2006: Julie Nguyen Brown Professor of Computational and Mathematical Sciences, Brown University.

2010: Awarded title of Professor Honoris Causa of the "Al.I. Cuza" University, Iaşi, Romania at the University "Al. I Cuza" 150th years and the *Seminarul Matematic* "A. Myller" 100 years Anniversaries Conference.

PhD students: Dejan Živković (1990), Ryan Tarpine (2011), Derek Aguiar (2014), Doug McErlean (honor thesis, 2015), Austin Huang (postdoc 2011), Fumei Lam (postdoc 2012), Alper Uzun (postdoc 2012).

Books:

1. (with P. Pevzner, M. Waterma, eds.) *Proc. 1st International Conference on Computational Molecular Biology (RECOMB 97)*, ACM Press, Santa Fe, New Mexico, 1997.

2. (with P. Pevzner, R. Shamir, eds.), Volume III on *Computational Molecular Biology*, DAM–CMB–Series, *Discrete Applied Mathematics*, 101, 1 (2003), North-Holland/Elsevier. The volume also appeared as a book with the same title in the *Topics in Discrete Mathematics* Book Series: No. 12, North-Holland/Elsevier.

3. (with M. Waterman, A. Clark, eds.) *Proc. 1st RECOMB Satellite Workshop Computational Methods for SNPs and Haplotype Inference,* Piscataway, NJ, November 21–22, 2004, *Lecture Notes in Bioinformatics,* 2983, 2004.

4. (with P. Pevzner, R. Shamir, F. Sun, eds.) *Special Issue Dedicated to Michael Waterman on the Occasion of his 67th Birthday:* Parts III–IV, *Communications in Information and Systems*, 10, 3–4 (2010), 1–115.

5. (with P. Pevzner, M. Waterman, eds.) *Journal of Computational Biology, RECOMB 99 Special Issue*, 6, 3/4 (1999).

Representative articles:

1. Polynomial Universal Traversal Sequences for Cycles Are Constructible, *Proc. 20th Annual ACM Symposium on Theory of Computing (STOC 1988)*, ACM Press, 1988, 491–453.

2. (with B. Bloom, A.R. Meyer) Bisimulation Can't be Traced, *Journal of the ACM*, 42, 1 (1995), 232–268, and in *Proc. 15th Annual ACM Symposium on Principles of Programming Languages (POPL88)*, ACM Press, 1988, 229–239.

3. (with W.E. Hart) Fast Protein Folding in the Hydrophobic-Hydrophilic Model Within Three-Eighths of Optimal, *Pro. 27th Annual ACM Symposium on Theory of Computation (STOC 1995)*, ACM Press, 1995, 157–168.

4. Statistical Mechanics, Three-Dimensionality and **NP**-Completeness: I. Universality of Intractability of the Partition Functions of the Ising Model Across Non-Planar Lattices, *Proc. 32nd ACM Symposium on the Theory of Computing (STOC 2000)*, ACM Press, Portland, Oregon, May 21–23, 2000, 87–96.

5. (with J.C. Venter *et al*.) The Sequence of the Human Genome, *Science*, 291 (2001), 1304–135.

6. (with A.G. Clark *et al*.) Whole Genome Shotgun Assembly and Comparison of Human Genome Assemblies, *Proceedings of the National Academy of Sciences*, 101 (2004), 1916–21.

7. (with E. Davidson) Logic Functions of the Genomic *cis*–Regulatory Code, *Proceedings of the National Academy of Sciences*, 102, 14 (2005), 4954–4959.

8. (with M. Samanta *et al*.) The Transcriptome of the Sea Urchin Embryo, *Science*, 314 (2006), 960–962.

9. (with S. Marcus) Alan Turing and John von Neumann – Their Brains and their Computers, *CiE 2012: Alan Turing Centenary Conference*, Cambridge, UK, June 18–23, 2012, and in *International Conference on Membrane Computing, CMC 2012, LNCS*, Springer, 2012, 26–35.

10. (with D. Aguiar) HAPCOMPASS: A Fast Cycle Basis Algorithm for Accurate Haplotype Assembly of Sequence Data, *Journal of Computational Biology*, 19, 6 (2012), 577–590.

Personal web page: http://www.brown.edu/Research/Istrail_Lab/

ISTRATE, Gabriel

Born on April 1, 1970, in Galați, Romania.

Education: Faculty of Mathematics, University of Bucharest, Romania (1994), master in Computer Science, University of Rochester, USA (1996).

PhD in computer science, University of Rochester, U.S.A., 1999. Thesis title: *Phase Transitions in Combinatorial Search Problems. Towards Rigorous Results.* Scientific advisor: Mitsunori Ogihara.

Postdoc stage: Center for Nonlinear Studies, Los Alamos National Laboratory, Los Alamos NM, USA (1999–2001).

Positions:

Technical staff member (researcher), Los Alamos National Laboratory, Los Alamos, N.M., USA 2001–2007.

Researcher, e-Austria Institute Timişoara, 2007 – present.

Associate Professor, West University of Timişoara. 2012 – present.

Research areas: Algorithms, computational complexity, phase transiotns in combinatorial optimization, discrete models of complex systems.

Main results:

Result in paper [1] gives a (first) example of an **NP**-complete problem with an easily determined phase transition, 1-in-*k* SAT.

Result in paper [2] below (on the phase transition in random Horn satisfiability) is included (as an exercise) in Donald Knuth's *The Art of Computer programming* vol. 4A, *Combinatorial Algorithms.*

Result in paper [10] shows that for any fixed *k* the Kneser-Lovász principle has combinatorial proofs. Previously only proofs of this result (essentially) using algebraic topology were available.

Result in paper [9] identifies the scaling of a parameter related to the Ulam-Hammersley problem for heapable sequences, bringing nonrigorous evidence that the scaling constant is equal to the golden ratio. The conjecture has been discussed on Michael Mitzenmacher's influent blog "My biased coin".

Editorial boards: *Computer Science Review* (Elsevier).

Membership to professional organizations: ACM, SIGACT.

Books:

1. (with A. Percus, C. Moore, eds.) *Computational Complexity and Statistical Physics*, Oxford University Press, Santa Fe Institute Lectures in the Sciences of Complexity, 2005.

Representative articles:

1. (with D. Achlioptas, A. Chtcherba, C. Moore) The Phase Transition in 1-in-*k* SAT and NAE 3-SAT, *Proc. ACM–SIAM Symposium on Discrete Algorithms* (SODA'01), 2001.
2. The Phase Transition in Random Horn Satisfiability and Its Algorithmic Implications, *Random Structures and Algorithms*, 20, 4 (2002), 483–506.
3. Computational Complexity and Phase Transitions, *Proc. 15th I.E.E.E. Conference on Computational Complexity*, 2000.
4. (with C. Moore, D. Demopoulos, M.Y. Vardi) A Continuous–Discontinuous Second-Order Transition in the Satisfiability of Random Horn-SAT Formulas, *Random Structures and Algorithms*, 31, 2 (2007).
5. (with L.A. Goldberg, C. Greenhill, M. Dyer, M. Jerrum) The Convergence of the Iterated Prisoner's Dilemma Game, *Combinatorics, Probability and Computing*, 11 (2002).
6. (with C.L. Barrett, V.S. Anil Kumar, M.V. Marathe, S. Thite, S. Thulasidasan) Strong Edge Coloring for Channel Assignment in Wireless Radio Networks, *Proc. Fourth IEEE International Conference on Pervasive Computing* (PERCOMW'06), *Workshop on Foundations and Algorithms for Wireless Networking*, 2006.
7. (with A. Percus, B. Tavares Gonçalves, R.Z. Sumi, S. Boettcher) The Peculiar Phase Structure of Random Graph Bisection, *Journal of Mathematical Physics*, 49, 12 (2008).
8. (with A. Crăciun) Proof Complexity and the Lovász-Kneser Theorem, *Proc. 17th International Conference on Theory and Applications of Satisfiability Testing* (SAT'14), *LNCS* 8561, Springer, 2014.
9. (with C. Bonchiş) Partition Into Heapable Sequences, Heap Tableaux and a Multiset Extension of Hammersley's Process, *Proc. 26th Annual Symposium on Combinatorial Pattern Matching* (CPM'2015), *LNCS* 9133, Springer, 2015.
10. (with J. Aisenberg, M.L. Bonet, S. Buss, A. Crăciun) Short Proofs of the Kneser-Lovász Coloring Principle, *Proc. 42nd International Colloquium on Automata, Languages, and Programming* (ICALP 2015), *LNCS* 9135, Springer, 2015.

Personal web page: http://tcs.ieat.ro/members/gistrate

IVANOV, Sergiu

Born on September 17, 1988, in Feodosia, Ukraine.

Education: Computer science engineering, Faculty of Computers, Computer Science, and Microelectronics, Technical University of Moldova, 2011.

PhD: Université Paris Est, 2015. Thesis title: *On the Power and Universality of Biologically-Inspired Models of Computation.* Scientific advisor: Sergey Verlan.

Scholarships, postdoc stages: Université Grenoble–Alpes, 2016–2017.

Positions: Temporary Teacher (ATER), Université Paris Est Créteil, 2015–2016; Assistant Professor (maître de conférences), Université Évry, since 2017.

Research areas: Unconventional computing, formal languages, universality, computational completeness, spring-mass modelling, software for biomodelling, insertion-deletion systems, multiset rewriting, membrane (P) systems, biomodelling, networks of evolutionary processors, register machines, Petri nets, reaction systems.

Main results: Polymorphic P systems, insertion-deletion systems with regular contexts.

Honors, prizes, scientific distinctions: Best Paper Award at ACMC 2017.

Representative articles:

1. (with R. Freund, L. Staiger) Going Beyond Turing with P Automata: Regular Observer ω-Languages and Partial Adult Halting, *IJUC*, 12, 1 (2016), 51–69.
2. (with A. Alhazov, E. Pelz, S. Verlan) Small Universal Deterministic Petri Nets with Inhibitor Arcs, *Journal of Automata, Languages and Combinatorics*, 21, 1–2 (2016), 7–26.
3. (with S. Azimi, C. Gratie, L. Manzoni, I. Petre, A.E. Porreca) Complexity of Model Checking for Reaction Systems, *Theor. Comput. Sci.*, 623 (2016), 103–113.
4. (with A. Meurer *et al.*) Sympy: Symbolic Computing in Python, *PeerJ PrePrints*, 4:e2083, 2016.
5. (with S. Verlan) Random Context and Semi-Conditional Insertion-Deletion Systems, *Fundam. Inform.*, 138, 1–2 (2015), 127–144.

6. (with S. Azimi, C. Gratie, I. Petre) Dependency Graphs and Mass Conservation in Reaction Systems, *Theor. Comput. Sci.*, 598 (2015), 23–39.

7. (with A. Alhazov, R. Freund) Hierarchical P Systems with Randomized Right-Hand Sides of Rules, *Proc. Conference on Membrane Computing, CMC* 2017, *LNCS* 10725, Springer, 2018, 15_39.

8. (with A. Alhazov, Yu. Rogozhin) Polymorphic P Systems, *Proc. Conference on Membrane Computing*, *CMC* 2010, *LNCS* 6501, Springer, 2010, 81–94.

Personal web page: http://lacl.fr/~sivanov/

JEBELEAN, Tudor

Born on December 1, 1955, in Timişoara, Romania.

Education: High school "C.D. Loga" Timişoara, 1970–1974;
Computer science studies (master included), University of the West, Timişoara, 1975–1979.

PhD: Johannes Kepler University, Linz, Research Institute for Symbolic Computation (RISC–Linz), 1994. Thesis title: *Systolic Multiprecision Arithmetic*. Scientific advisor: Bruno Buchberger (second advisor: George Collins).
Habillitation: Johannes Kepler University, Linz, 2001, thesis: *Non-Conventional Algorithms for Multiple Precision Arithmetic*.

Scholarships: Doctoral scholarship from the Austrian Science Fundation, Research Institute for Symbolic Computation, 1990–1994.

Positions:
Analyst-programmer (1979–1980), Computer Center of "Uzina de Vagoane", Arad.
Analyst-programmer (1980–1984), Assistant Professor (1984–1990), University of Timişoara.
Research Assistant (1990–1994), Postdoctoral Researcher (1994–1996), Assistant Professor (1996–2002), Associate Professor (2002 – present), Research Institute for Symbolic Computation (RISC–Linz), Johannes Kepler University, Linz, Austria.

Research areas: Computational logic, long integer arithmetic, systolic computation, parallel computation, cellular automata, formal languages and automata.
Teaching experience: formal languages, mathematical logic, automated reasoning, parallel computing, functional and logic programming, techniques for scientific work.

Main results:
– Bilinear automata and their corresponding language.
– Non-propagating one-way constant time cellular automata recognize exactly the regular languages.
– Efficient exact division, bidirectional exact division.
– Generalization of the binary GCD algorithm.
– Improvement of the Lehmer GCD algorithm.

– Practical integer division with Karatsuba complexity.

– Systolic algorithms and circuits for integer and rational arithmetic.

– The S-decomposition method for natural style proofs for formulae with alternating quantifiers.

– Method involving algebraic techniques for finding witnesses and instantiation terms in natural style proofs over reals.

– Method for functional-recursive synthesis of systolic arrays (on-line multiplication, GCD).

– Method for the generation of loop invariants using recursion equations.

– Pure logical approach to program termination.

– Methods for proof-based synthesis of sorting algorithms for lists and for binary trees.

Administrative positions: Co-founder of the Institute e-Austria Timişoara and member of its the Directory Council, since 2002.

Membership to professional organizations: Austrian Mathematical Society, German Mathematical Society, IEEE Computer Society, ACM.

Honors: Erste Bank award for the best PhD thesis (Nov. 1994).

PhD students: Mircea Drăgan (2004), Gabor Kusper (2005), Laura Kovacs (2007), Laura Szakacs-Ruff (2007), Nikolaj Popov (2008), Camelia Kocsis-Rosenkranz (2009), Isabela Dramnesc (2012), Mădălina Erascu (2012).

Books, special journal issues, proceedings:

1. (with B. Buchberger, M. Affenzeller, A. Ferscha, M. Haller, E.P. Klement, P. Paule, G. Pomberger, W. Schreiner, R. Stubenrauch, R. Wagner, G. Weiß, W. Windsteiger, eds.) *Hagenberg Research*, Springer, Berlin, 2009.

2. (with A. Armando, eds.) *Calculemus: Integrating Computation and Deduction*. *J. of Symbolic Computation* (spec. issue), 32 (2001), 303 pages.

3. (with D. Wang, Wei Li, eds.) *Program Verification, Automated Debugging, and Symbolic Computation*, *J. of Symbolic Computation* (spec. issue), 80 (2017), 1–249.

4. (with D. Zaharie, eds.). *SYNASC 2017 (19th International Symposium on Numeric and Symbolic Algorithms for Scientific Computing)*, IEEE Computer Society Press, 2018.

Representative articles:

1. Cellular Automata as Parallel Devices for Language Recognition, *Ann. Univ. Timişoara, Math. Sci.*, XXVI, 3 (1988), 29–45.

2. Bilinear Automata, *Studii şi Cercetări Matematice*, 42 (1990), 19–29.

3. An Algorithm for Exact Division, *J. of Symbolic Computation*, 15 (1993), 169–180.

4. A Generalization of the Binary GCD Algorithm, *ISSAC'93 (International Symposium on Symbolic and Algebraic Computation)*, ACM Press, 1993, 111–116.

5. A Double-Digit Lehmer-Euclid Algorithm for Finding the GCD of Long Integers, *J. of Symbolic Computation*, 19 (1995), 145–157.

6. (with W. Krandick) Bidirectional Exact Integer Division, *J. of Symbolic Computation*, 21 (1996), 441–455.

7. Practical Integer Division with Karatsuba Complexity, *ISSAC'97 (International Symposium on Symbolic and Algebraic Computation)*, ACM Press, 1997, 339–341.

8. (with L. Ruff) Functional-Based Synthesis of a Systolic Array for GCD Computation, *IFL 2006 (Implementation and Application of Functional Languages)*, *LNCS* 4449, Springer, 2007, 37–54.

9. (with I. Dramnesc) Synthesis of List Algorithms by Mechanical Proving, *J. of Symbolic Computation*, 69 (2015), 61–92.

10. (with B. Buchberger, T. Kutsia, A. Maletzky, W. Windsteiger) Theorema 2.0: Computer-Assisted Natural-Style Mathematics, *J. of Formalized Reasoning*, 9 (2016), 149–185.

Further information:

Co-founder and member of the steering committee of *SYNASC* (*International Symposium of Numeric and Symbolic Algorithms for Scientific Computing*, yearly in Timisoara) and co-chair of the track „Logic and Programming" since 1998.

Selected projects: Multiple Precision Arithmetic on Parallel Architectures (Austrian Science Fundation), 1994–1997; Rewriting techniques and efficient theorem proving (INTAS), 1997–2000; Practical Formal Verification Using Automated Reasoning and Model Checking (INTAS), 2006–2009; mpcEnergy: Increasing the Energy Efficiency in Buildings by Energy Management using Refined Process Modeling and Optimization Strategies. Funding: Upper Austrian Government, 2013; Institute e-Austria Timişoara: Mathematical Theory Exploration for Industrial Applications (Austrian Ministry of Science), 2008–2011; SFB Numerical and Symbolic Scientific Computing (Austrian FWF), 1998–2008.

Personal web page: www.risc.jku.at/people/tjebelea

KARI, Lila (maiden name: Sântean)

Born on October 22, 1964, in Tulcea, Romania.

Education: University of Bucharest, Faculty of Mathematics and Informatics, 1983–1987.

PhD: University of Turku, Finland, 1991. Thesis title: *On Insertion and Deletion in Formal Languages.* Scientific advisor: Arto Salomaa.

Positions:

Professor, University Research Chair, School of Computer Science, 2015 – present, University of Waterloo, Canada.

Assistant Professor (1996–2000), Associate Professor (2000–2007), Professor (2007–2017), Computer Science Department, University of Western Ontario, Canada.

Visiting Professor (1993–1995), Lecturer/researcher (1995–1996), Mathematics Department, University of Western Ontario, Canada.

Lecturer (1992–93), Vaasa Institute of Technology, Finland.

Research Associate (1990–1993), Academy of Finland, University of Turku, Finland.

Research Associate (1987–1989), Institute for Computers and Informatics, Bucharest, Romania.

Research areas: Natural computation, bioinformation and biocomputation – theoretical aspects, nanocomputation by DNA self-assembly, models of cellular computation, Watson-Crick complementarity in formal languages and automata theory, bioinformatics, comparative genomics.

Main results:

Proposed an alignment-free method based on chaos game representation of DNA genomic sequences combined with information distance, to identify and classify species based on molecular evidence.

Proved (with Leonard Adleman and Jarkko Kari) the undecidability of self-assembly of infinite ribbons, in the context of DNA nano-computations by self-assembly.

Initiated and explored (with Laura Landweber) the study of computational power of DNA processing in ciliates (a type of unicellular organisms), and showed that the DNA operations performed by genetic recombination in these organisms are Turing universal.

Introduced (with Gabriel Thierrin) contextual insertions and deletions systems – a formal language model for DNA Computation – and proved that they are computationally complete.

Introduced and investigated (with Gheorghe Păun) parallel communicating grammar systems, a formal language model for massively parallel communicating processing systems.

Editorial boards: *Theoretical Computer Science, Series C – Theory of Natural Computing* (member of the editorial board 1999–2014, editor-in-chief 2014 – present), *The Handbook of Natural Computing* (Springer, 2012, area editor), *Natural Computing* (Springer; member of the editorial board 2002–2006, area editor, 2006 – present), *Journal of Universal Computer Science* (2002 – present).

Membership to professional organizations: American Association of Computing Machinery, ACM International Society for Nanoscale Science, Computation and Engineering, ISNSCE

Honors, prizes, scientific distinctions:

Rozenberg Tulip Award – DNA Computer Scientist of the Year, 2015; Canada Research Chair in Biocomputing, 2002–2006 and 2007–2011; Florence Bucke Science Prize, University of Western Ontario, 2002; Ontario Distinguished Researcher Award, Ontario Innovation Trust, 2002; University of Western Ontario, Faculty of Science Award of Excellence for Exceptional Performance in Undergraduate Teaching, 2000; Nevanlinna Prize for the best doctoral thesis in mathematics, Finland, 1991.

Leadership roles: Member of the Natural Sciences and Engineering Research Council of Canada (NSERC) E.W.R. Steacie Memorial Fellowships Committee, 2017.

Program Committee co-chair and Organizing Committee chair for the 13th International Conference on Unconventional Computation and Natural Computation, UCNC 2014, London, Canada, July 2014.

Member of the Advisory Board of the Springer book series *Monographs in Theoretical Computer Science*, *Texts in Theoretical Computer Science*, 2012 – present.

Member of the Board of Directors of the Fields Institute for Research in the Mathematical Sciences, 2011–2014.

Member of the NSERC Herzberg Brockhouse Polanyi Prize Committee, 2010.

Chair of the International Steering Committee for DNA Computing Conferences (DNA), 2005–2008.

Member of the NSERC Computer Science Grant Selection Committee, 2003–2007.

PhD students: Amir Hossein Simjour (2017), Rallis Karamichalis (2016), Srujan Kumar Enaganti (2015), Manasi Kulkarni (2015), Bo Cui (2011), Shinnosuke Seki (2010), Elena Losseva (2005), Mark Daley (2003).

Representative articles:

1. (with R. Karamichalis, S. Konstantinidis, S. Kopecki, S. Solis–Reyes) Additive Methods for Genomic Signatures, *BMC Bioinformatics*, 17 (2016), 313.
2. (with K. Hill, A. Sayem, R. Karamichalis, N. Bryans, K. Davis, N. Dattani) Mapping the Space of Genomic Signatures, *PLoS ONE*, 10(5): e0119815.
3. (with El. Czeizler, Eu. Czeizler, S. Seki) An Extension of the Lyndon–Schützenberger Result to Pseudoperiodic Words, *Information and Computation*, 209 (2011), 717–730.
4. (with S. Seki) An Improved Bound for an Extension of Fine and Wilf's Theorem, and Its Optimality, *Fundamenta Informaticae*, 101, 3 (2010), 215–236.
5. (with L. Adleman, J. Kari, D. Reishus, P. Sosik) The Undecidability of the Infinite Ribbon Problem: Implications for Computing by Self-Assembly, *SIAM J. Comput.*, 38, 6 (2009), 2356–2381.
6. (with G. Rozenberg) The Many Facets of Natural Computing, *Communications of the ACM,* 51, 10 (Oct. 2008), 72–83. Cover Story of *Communications of the ACM.*
7. (with L. Landweber) The Evolution of Cellular Computing: Nature's Solution to a Computational Problem, *Biosystems*, 52 (1999), 3–13.
8. DNA Computing – The Arrival of Biological Mathematics, *The Mathematical Intelligencer*, 19 (1997), 9–22.
9. *On Insertion and Deletion in Formal Languages*, PhD Thesis, University of Turku, 1991.
10. (with Gh. Păun) Parallel Communicating Grammar Systems – The Regular Case, *Analele Universităţii din Bucureşti, Seria matematică–informatică*, 2 (1989), 55–63.

Personal web page: https://cs.uwaterloo.ca/~lila/

LEFTICARU, Raluca-Elena

Born on June 30, 1981, in Piteşti, Argeş county, Romania.

Education: Bachelor in mathematics and computer science (2000–2004), and Master in computer science (2004–2006), University of Piteşti, Romania.

PhD in computer science, University of Piteşti, Romania, 2011. Thesis title: *Testing Methods Based on Formal Specification.* Scientific advisor: Florentin Ipate.

Scholarships, postdoc stages: University of Bradford, UK, July 2016 – present; Sheffield Hallam University, UK, Jan. 2016 – June 2016; University of Bradford, UK, Aug. 2015 – Dec. 2015; University of Sheffield, UK, Febr. 2014 – Sept. 2015.

Positions:

Post-doctoral Research Assistant: University of Bradford, July 2016 – June 2018.

Researcher (post-doctoral): Sheffield Hallam University, Jan. – June 2016.

Post-doctoral Research Assistant: University of Bradford, Aug. – Dec. 2015 (full time Oct. – Dec. 2015; part time, shared with Univ. of Sheffield, Aug. – Sept. 2015).

Research Associate: University of Sheffield, Feb. 2014 – Sept. 2015 (full time Feb. 2014 – July 2015, part time, shared with Univ. of Bradford, Aug. – Sept. 2015).

Lecturer: University of Bucharest, Oct. 2012 – Feb. 2018 (position on hold for 4 years Feb. 2014 – Feb. 2018, while being a postdoctoral researcher abroad).

Teaching Assistant, University of Piteşti, Feb. 2008 – Sept. 2012.

Programmer: S.C. Lisa Dräxlmaier Autopart Romania S.R.L., 2005–2007.

Analyst: S.C. DSR Dräxlmaier Serviceleistungen Romania S.R.L., 2004–2005.

Research areas: Testing and verification, membrane computing, formal specification methodologies, agent based modelling.

Main results:

Proposed methods to automate test generation from state machine models, using search-based techniques (such as genetic algorithms, particle swarm optimization) and different fitness functions.

Testing and formal verification for different types of P systems.

Kernel P systems: applications, modelling, simulation, verification.

Membership to professional organizations: Computability in Europe (CiE), International Membrane Computing Society (IMCS), Formal Methods Europe (FME).

Honors, prizes, scientific distinctions:

Various prizes in regional and national student contests during high school.
Third Prize in the National Olympiad of Mathematics, Alba Iulia, 1999.
Third Prize in the National Olympiad of Mathematics, Braşov, 2000.

Representative articles:

1. (with M. Gheorghe, R. Ceterchi, F. Ipate, S. Konur) Kernel P Systems: From Modelling to Verification and Testing, *Theoretical Computer Science* (in press): https://doi.org/10.1016/j.tcs.2017.12.010

2. (with X. Wang, G. Zhang, F. Neri, T. Jiang, J. Zhao, M. Gheorghe, F. Ipate) Design and Implementation of Membrane Controllers for Trajectory Tracking of Nonholonomic Wheeled Mobile Robots, *Integrated Computer-Aided Engineering*, 23, 1 (2016), 15–30.

3. (with M. Gheorghe, F. Ipate, M. J. Pérez-Jiménez, A. Ţurcanu, L. Valencia Cabrera, M. García Quismondo, L. Mierlă) 3-Col Problem Modelling Using Simple Kernel P Systems, *International Journal of Computer Mathematics*, 90, 4 (2013), 816–830.

4. (with F. Ipate, C. Tudose) Formal Verification of P Systems Using Spin, *International Journal of Foundations of Computer Science*, 22, 1 (2011), 133–142.

5. (with M. Gheorghe, F. Ipate) An Empirical Evaluation of P System Testing Techniques, *Natural Computing*, 10, 1 (2011), 151–165.

6. (with F. Ipate, M. Gheorghe) Test Generation from P Systems Using Model Checking, *Journal of Logic and Algebraic Programming*, 79, 6 (2010), 350–362.

7. (with C. Tudose, F. Ipate) Using Genetic Algorithms and Model Checking for P Systems Automatic Design, *Proc. Fifth International Workshop on Nature Inspired Cooperative Strategies for Optimization* (NICSO 2011), Cluj-Napoca, Romania, October 2011, *Studies in Computational Intelligence*, 387 (2012), 285–302.

8. (with F. Ipate) An Improved Test Generation Approach from Extended Finite State Machines Using Genetic Algorithms, *Proc. Tenth International Conference on Software Engineering and Formal Methods* (SEFM 2012), Thessaloniki, Greece, October 2012, *LNCS* 7504, Springer, 2012, 293–307.

9. (with F. Ipate) Functional Search-Based Testing from State Machines, *Proc. IEEE International Conference on Software Testing Verification and Validation* (ICST 2008), Lillehammer, Norway, April 2008, IEEE Computer Society, 2008, 525–528,

10. (with F. Ipate) Automatic State-Based Test Generation Using Genetic Algorithms, *Proc. Ninth International Symposium on Symbolic and Numeric Algorithms for Scientific Computing* (SYNASC 2007), Timişoara, Romania, September 2007, IEEE Computer Society, 2007, 188–195.

Personal web page at the University of Bradford – contains updated list of publications: https://www.brad.ac.uk/ei/s/?u=rleftica

LEUŞTEAN, Ioana Gabriela

Born on October 21, 1971, in Bucharest, Romania.

Education:
BSc in mathematics, University of Bucharest, Romania, 1990–1995.
Master in fundamentals of computing, University of Bucharest, Romania, 1995–1996.

PhD: University of Bucharest, 2004. Thesis title: *Contributions to the Theory of MV-Algebras: MV-Modules*. Scientific advisor: Sergiu Rudeanu.
Habilitation: University of Bucharest, 2017.

Postdoctoral fellowships: "Alexander von Humboldt" Research Fellowship, Technische Universität Darmstadt, Germany, September 2007 – August 2009.

Positions: Teaching Assistant (1996–1999), Assistant Professor (1999–2012), Associate Professor (2012–2017), Professor (since 2017), University of Bucharest, Romania.

Research areas and main results: My research belongs to the area of uncertainty reasoning – many-valued logic in general and Łukasiewicz logic in particular, approached from various perspectives: logical, algebraic, probabilistic. Main research directions and results: the development of the Łukasiewicz logic with product, the study of Riesz MV-algebras, the study of the Pierce-Birkhoff conjecture in connection with Łukasiewicz logic, a solution to the problem of stochastic independence for probability MV-algebras, the determination principle for the n-valued Łukasiewicz-Moisil algebras, the definition of the non-commutative Łukasiewicz logic.

Editorial boards: *Soft Computing – A Fusion of Foundations, Methodologies and Applications* (Springer).

Membership to professional organizations: ACM (Association for Computing Machinery), EUSFLAT (European Society for Fuzzy Logic and Technology).

Awards: The 2008 "Grigore C. Moisil" Prize of the Romanian Academy, awarded in 2010.

Book chapters:

1. (with A. Di Nola) Łukasiewicz Logic and MV-Algebras, P. Cintula, P. Hajek, C. Noguera, eds.), *Handbook of Mathematical Fuzzy Logic*, volume 2, Studies in Logic 37, College Publications, London, 2011, 1–102.

Representative articles:

1. (with A. Di Nola, S. Lapenta) An Analysis of the Logic of Riesz Spaces with Strong Unit, *Annals of Pure and Applied Logic*, 169 (2018), 216–234.

2. (with S. Lapenta) Stochastic Independence for Probability MV-Algebras, *Fuzzy Sets and Systems*, 298 (2016), 94–206.

3. (with S.Lapenta) A General View on Normal form Theorems for Lukasiewicz Logic with Product, in *Concepts of Proof in Mathematics, Philosophy and Computer Science*, D. Probst, P. Schuster, eds., Ontos Mathematical Logic. Walter de Gruyter, Berlin 2016, 215–228.

4. (with S. Lapenta) Towards Understanding the Pierce-Birkhoff Conjecture Via MV-Algebras, *Fuzzy Sets and Systems*, 276 (2015), 114–130.

5. (with A. Di Nola) Łukasiewicz Logic and Riesz Spaces, *Soft Computing,* 18 (2014), 2349–2363.

6. Metric Completions of MV-Algebras with States. An Approach to Stochastic Independence, *Journal of Logic and Computation*, 21 (2011), 493 l508.

7. A Determination Principle for Algebras of *n*-Valued Łukasiewicz Logic, *Journal of Algebra*, 320 (2008), 3694–3719.

8. Non-Commutative Łukasiewicz Propositional Logic, *Archive for Mathematical Logic*, 45 (2006), 191–213.

9. (with A. Di Nola, P. Flondor) MV-Modules, *Journal of Algebra*, 267 (2003), 21–40.

10. (with R. Ball, G. Georgescu) Cauchy Completions of MV-Algebras, *Algebra Universalis*, 47 (2002), 367–407.

Personal web page: www.unibuc.ro/~ileustean/

LEUŞTEAN, Laurenţiu

Born on January 16, 1971, in Drobeta Turnu-Severin, Romania.

Education:
BSc in mathematics, University of Bucharest, 1990–1995.
Master in computer science, University of Bucharest, 1996–1997.

PhD: University of Bucharest, 2004. Thesis title: *Representations of Many-Valued Algebras*. Scientific advisor: George Georgescu.

Habilitation: Technische Universität Darmstadt, Germany, 2009, and "Simion Stoilow" Institute of Mathematics of the Romanian Academy, 2013.

Scholarships, postdoc stages:
BRICS, University of Aarhus, Denmark, Marie Curie fellowship, 2002.
NASA Ames Research Center, USA, Summer Student Research Program, 2002 and 2003.
Mathematisches Forschungsinstitut Oberwolfach, Germany, Oberwolfach Leibniz Fellowship, 2008 and 2009.

Positions:
Programmer, Scientific Researcher, National Institute for Research and Development in Informatics (ICI), Bucharest, 1995–2000.
Assistant Professor, Technische Universität Darmstadt, Germany, 2004–2009.
Scientific Researcher, Senior Researcher, "Simion Stoilow" Institute of Mathematics of the Romanian Academy, Bucharest, 2003 – present.
Professor, University of Bucharest, 2014 – present.

Research areas: Mathematical logic, proof mining, optimization, nonlinear analysis, ergodic theory, many-valued logics

Main research results:
– quadratic rates of asymptotic regularity for the Mann iteration of non-expansive mappings in $CAT(0)$-spaces,
– effective uniform rates of asymptotic regularity and metastability for non-linear ergodic averages,
– a quantitative analysis of Fejér monotone sequences,
– effective bounds on the Proximal Point Algorithm,

– a finitary version of the von Neumann mean ergodic theorem,
– quantitative convergence results in nonlinear analysis,
– logical metatheorems for important classes of spaces,
– sheaf representations of BL-algebras,
– a certifier for Kalman filters.

Administrative positions:
Vice-rector of the University of Bucharest, 2016–present.
Director of ICUB (Research Institute of the University of Bucharest), 2016 – present.

Membership to professional organizations:
American Mathematical Society (AMS), 2003 – present.
Association for Symbolic Logic (ASL), 2004–2009 and 2013 – present.
Deutsche Vereinigung für Mathematische Logik und für Grundlagen-forschung der Exakten Wissenschaften (DVMLG), 2010–2014.

Prizes: The 2010 "Simion Stoilow" Award of the Romanian Academy (awarded in 2012).

PhD students: Andrei Sipoş (2015–2017).

Books:
1. *Representations of Many-Valued Algebras*, Editura Universitară, Bucharest, 2010.

Representative articles:
1. (with U. Kohlenbach, A. Nicolae) Quantitative Results on Fejér Monotone Sequences, *Communications in Contemporary Mathematics*, 20 (2018), 1750015.
2. (with A. Nicolae) Effective Results on Nonlinear Ergodic Averages in $CAT(k)$ Spaces, *Ergodic Theory and Dynamical Systems*, 36 (2016), 2580–2601.
3. (with D. Ariza-Ruiz, G. López-Acedo) Firmly Nonexpansive Mappings in Classes of Geodesic Spaces, *Transactions of the American Mathematical Society*, 366 (2014), 4299–4322.
4. (with U. Kohlenbach) Effective Metastability of Halpern Iterates in $CAT(0)$ Spaces, *Advances in Mathematics*, 231 (2012), 2526–2556.
5. (with U. Kohlenbach) On the Computational Content of Convergence Proofs Via Banach Limits, *Philosophical Transactions of the Royal Society*, A 370 (2012), 3449–3463.
6. Nonexpansive Iterations in Uniformly Convex W–Hyperbolic Spaces, in A. Leizarowitz, B.S. Mordukhovich, I. Shafrir, A. Zaslavski, eds.: *Nonlinear Analysis and Optimization I: Nonlinear Analysis, Contemporary Mathematics*, 513 (2010), 193–209.

7. (with U. Kohlenbach) Asymptotically Nonexpansive Mappings in Uniformly Convex Hyperbolic Spaces, *Journal of the European Mathematical Society*, 12 (2010), 71–92.

8. A Quadratic Rate of Asymptotic Regularity in *CAT*(0)–Spaces, *Journal of Mathematical Analysis and Applications*, 325 (2007), 386–399.

9. (with G. Roşu, R. Prasad Venkatesan, J. Whittle) Certifying Optimality of State Estimation Programs, *Computer Aided Verification* (*CAV*) 2003, *LNCS* 2725, Springer, 2003, 301–314.

10. (with A. Di Nola) Compact Representations of BL-Algebras, *Archive for Mathematical Logic*, 42 (2003), 737–761.

Personal web page: www.unibuc.ro/~lleustean/

LUCANU, Dorel

Born on November 28, 1956, in Vînători-Neamţ, Romania.

Education: Faculty of Mathematics, "Al.I. Cuza" University of Iaşi (1977–1981).

PhD: Institute of Mathematics of the Romanian Academy, 1994. Thesis title: *Algebraic Methods in the Study of the Concurrent Systems*. Scientific advisor: Mirela Ştefănescu.

Positions:

Analyst-programmer in a Bacău factory (Oct. 1981–Jan. 1984).

Analyst-programmer (1984–1990), Assistant Professor (1990–1991), Lecturer (1991–1996), Associate Professor (1996–2004), Professor (2004 – present), "Al.I. Cuza" University of Iaşi.

Research areas: Formal methods, programming languages, software engineering, logics, rewriting, membrane systems, semantic web.

Main results:

Co-author of a coinduction-based formalisation of the symbolic execution, which is language independent, and its implementation in K Framework 3.4.

Contributions to the development of the K Framework, a language independent rewrite-based framework in which programming languages, type systems and formal analysis tools can be defined and executed.

Co-author of a proof system for the circular coinduction and its implementation in CIRC, a prover for equations behavioural equivalence. The method was extended to prove the equivalence of the non-deterministic coalgebras.

Co-author of a framework that defines the rewriting-logic-based operational semantics for the membrane systems and use of the rewriting engine Maude for analysing their properties.

Co-author of the formalisation of the logics underlying the semantic web as institutions and use of the institution morphisms to relate these logics. This approach allows the use of Grothendieck institutions to combine Web ontologies described in various languages.

A category-based definition of the models for rewrite theories, obtained by replacing the equality of functors, defined by E-equal terms, with the equality

via a natural isomorphism, called natural symmetry. The result is a wide palette of model classes which offers more flexibility in modelling concurrent systems. This extends a result from the PhD thesis.

Administrative positions:
Director, Department of Computer Science (2008 – present).
Vice-dean, Faculty of Computer Science (2000–2008).
Technical manager, Romanian Branch of Gentriqs (a Software Development Company from Germany; 2000–2001).

Editorial boards: *Scientific Annals of Computer Science "Al.I. Cuza" University of Iaşi.*

Membership to professional organisations: ACM Special Interest Group on Programming Languages (SIGPLAN).

Honours, prizes, scientific distinctions: "Grigore C. Moisil" Prize, Romanian Academy, 2004.

PhD students: Irina Mariuca Asăvoae (2012), Mihail Asăvoae (2012), Andrei Arusoaie (2014), Denis Bogdănaş (2015), Raluca Iulia Necula (2018).

Books:
1. (editor) *Rewriting Logic and Its Applications – 11th International Workshop*, WRLA 2016, *Revised Selected Papers, LNCS* 9942, Springer, Berlin, 2016.
2. (with M. Craus) *Proiectarea algoritmilor*, Polirom, Iaşi, 2008.
3. *Proiectarea algoritmilor: Tehnici elementare*, Editura Universității "Al.I. Cuza", Iaşi, 1993.

Representative articles:
1. (with V. Rusu, A. Arusoaie) A Generic Framework for Symbolic Execution: A Coinductive Approach, *J. Symb. Comput.*, 80 (2017), 125–163.
2. (with Ş. Ciobâcă, V. Rusu, G. Roşu) A Language-Independent Proof System for Full Program Equivalence, *Formal Asp. Comput.*, 28, 3 (2916), 469–497.
3. (with V. Rusu, T.-F. Şerbănuță, A. Arusoaie, A. Ştefănescu, G. Roşu) Language Definitions as Rewrite Theories, *J. Log. Algebr. Meth. Program.*, 85, 1 (2016), 98–120.
4. (with M. Bonsangue, G. Caltais, E.-L. Goriac, J. Rutten, A. Silva) Automatic Equivalence Proofs for Non-Deterministic Coalgebras, *Science of Computer Programming*, 78, 9 (2013), 1324–1345.
5. (with T.-F. Şerbănuță, G. Roşu) K Framework Distilled, in *WRLA, LNCS* 7571, Springer, 2012, 31–53.

6. (with G. Roşu) Circular Coinduction – A Proof Theoretical Foundation, in *CALCO* 2009, *LNCS* 5728, Springer, 2009, 127–144.

7. (with E.-I. Goriac, G. Caltais, G. Roşu) CIRC: A Behavioral Verification Tool Based on Circular Coinduction, in *CALCO* 2009, *LNCS* 5728, Springer 2009, 433–442.

8. (with O. Andrei, G. Ciobanu) A Rewriting Logic Framework for Operational Semantics of Membrane Systems, *Theoretical Computer Science*, 373, 3 (2007), 163–181.

9. (with Y.F. Li, J.S. Dong) Semantic Web Languages – Towards an Institutional Perspective, in *Algebra, Meaning and Computation, LNCS* 4060, Springer, 2006, 99–124.

10. Relaxed Models for Rewriting Logic, *Theoretical Computer Science*, 290, 1 (2003), 265–289.

Further information:

Strong collaborations with Formal System Laboratory from University of Illinois at Urbana Champaign, US; INRIA Lille-Nord, France; Centrum Wiskunde & Informatica (CWI), Amsterdam, Netherlands; National University of Singapore.

Personal web page: http://fmse.info.uaic.ro/~dorel.lucanu/

LUCHIAN, Henri

Born in 1955, in Bârlad, Romania.

Education: MSc in computer science, "Al.I. Cuza" University of Iaşi, 1979. Disertation: *Crossing-Sequence Complexity of Formal Languages*. Scientific advisor: Dan Simovici.

PhD: "Babeş-Bolyai" University, Cluj-Napoca, 1994. Thesis title: *Semantic and Protection Models for Scientific and Statistical Databases.* Scientific advisors: Adolf Haimovici and Grigor Moldovan.

Scholarships, postdoc stages: University of Saarbrucken (2000), University of Sheffield (1999), Université Aix-Marseille II, Marseille (1997), University of Central Lancashire (1995), University of Virginia (1994), ETH Zurich (1992), Université des Sciences et Technologies de Lille (1992), University of Rostock (1991).

Invited researcher: National University of Singapore (2003), Université Paris Sud Orsay (1996), Napier University of Edinburgh (1995, 1993).

Invited professor: University of Perugia (2002), University of Konstanz (2001).

Invited speaker: Hankuk University, Seul (2013), University of Tokyo (2010), Napier University (2010), University of Jyvaskyla (1999), Université des Sciences et Technologies de Lille (1999), Rijksuniversiteit Groningen (1998).

Positions:

Associate Professor, Lecturer, Assistant Professor, Faculty of Computer Science and Faculty of Mathematics, "Al.I. Cuza" University of Iaşi (1983–2000). Professor, Faculty of Computer Science, "Al.I. Cuza" University of Iaşi (since 2001).

Research areas: Evolutionary computing / natural computing, data mining, statistical databases.

Main results: A unifying criterion for unsupervised clustering and feature selection. A theoretical model for database normalisation. A practical model for protection in statistical databases. Efficient evolutionary solutions for graph colouring, clustering, cross clustering, graph colouring, MaxClique problem, circuit design. Soft computing, ensemble techniques for malware detection. Integrated-adaptive genetic Algorithms. Protein structure prediction in lattice models. Probabilistic vector machine (statistical binary classifier). PSO-aided connectivity in *k*-means. Outlier

detection with nonlinear projection pursuit. PSO-spanning tree representation for Ising spin glasses. Gene expression programming classifiers for ensemble prediction in time series. Guiding users within trust networks using swarm algorithms. A gene expression programming-based approach for solving Fredholm first kind integral equations. A memetic timetabling system.

Administrative positions: Vice-rector, "Al.I. Cuza" University. Member of the Executive Board and Treasurer, Coimbra Group of Universities.

Membership to professional organizations: ACM.

PhD students: Elena Băutu (2010), Andrei Băutu (2010), Mihaela Breaban (2011), Mădălina Ioniță (2011), Vasile Alaiba (2011), Dragoş Gavriluț (2012), Florentin-Emanuel Olariu (2012), Andrei Sucilă (2012), Cristian Rotaru (2013), Mihai Cimpoieşu (2013), Ştefan Negru (2013), Mihai Răzvan Benchea (2014), Eugen Croitoru (2016), Andrei Panu (2017).

Books:

1. *Meta-Heuristics in Optimization and Data Analysis. Applications to Geo-sciences,* chapter 2 in *Artificial Intelligent Approaches in Petroleum Geosciences*, Springer, Berlin, 2015.
2. *Genetic Programming Techniques with Applications in the Oil and Gas Industry,* chapter 3 in *Artificial Intelligent Approaches in Petroleum Geosciences*, Springer, Berlin, 2015.
3. *Three Evolutionary Approaches to Classification,* chapter XVI in *Evolutionary Algorithms in Computer Science*, John Wiley and Sons, 1999.

Representative articles:

1. A Unifying Criterion for Unsupervised Clustering and Feature Selection, *Pattern Recognition*, 44, 4 (2011), 854–865.
2. Feature Extraction Using Genetic Algorithms for Zero False Positive Malware Classification, *Proc. EVOLVE*, 2015, 82–93.
3. PSO Aided *k*-Means Clustering: Introducing Connectivity in *k*-Means, *Proc. GECCO – Genetic and Evolutionary Computation*, 2011, 1227–1234.
4. Protein Structure Prediction in Lattice Models with Particle Swarm Optimization, *Proc. ANTS – Swarm Intelligence*, 2010, 512–519.
5. A Study of Adaptation and Random Search in Genetic Algorithms, *Proc. CEC 2006, IEEE Congress on Evolutionary Computation*, 2103–2110.
6. Symbolic Regression on Noisy Data with Genetic and Gene Expression Programming, *Proc. Symbolic and Numeric Algorithms for Scientific Computing* – 2005.

7. Integrated-Adaptive Genetic Algorithms, *Proc. Advances in Artificial Life*, Springer, 2003, 635–642.

8. Statistical Dependencies, *Scientific and Statistical Database Systems*, 1996, 32–41.

9. Answer-Perturbation Techniques for the Protection of Statistical Databases, *Statistics and Computing*, 5, 3 (1995), 203–213.

10. Using a Genetic Algorithm for Optimizing Fixed Polarity Reed-Muller Expansions of Boolean Functions, *International Journal of Electronics*, 76, 4 (1994), 601–609.

Personal web page: http://www.info.uaic.ro/~hluchian

MANEA, Florin-Silviu

Born on September 21, 1980, in Bucharest, Romania.

Education:

1999–2003: Faculty of Mathematics and Computer Science, University of Bucharest, Bachelor of Science in computer science.

2003–2005: Faculty of Mathematics and Computer Science, University of Bucharest, Master of Science (in theoretical computer science).

PhD: Faculty of Mathematics and Computer Science, University of Bucharest, 2007. Thesis title: *Networks of Bio-Processors.* Scientific advisor: Victor Mitrana.

Scholarships:

Postdoctoral Research Fellowship ("Alexander von Humboldt" Foundation).

Research fellowship for PhD students (BD Fellowship, CNCSIS, Romanian Ministry of Education).

Performance and merit fellowships during BSc and MSc studies (University of Bucharest).

Participation fellowships: ESSLLI 2003, ESSLLI 2004 (declined), Vilem Mathesius Lectures 2003.

Positions:

2013 – present: Department of Computer Science, Kiel University, Germany, Principal Investigator on my own Deutsche Forschungsgemeinschaft (DFG) Grant.

2011–2013: Department of Computer Science, Kiel University, Germany, Researcher on DFG grant, Dependable Systems group.

2009–2011: Faculty of Computer Science, Otto-von-Guericke University Magdeburg, Germany, "Alexander von Humboldt" Foundation Research Fellow.

Research Assistant (2004–2007), Teaching Assistant (2007–2008), Lecturer (2008–2013), Faculty of Mathematics and Computer Science, University of Bucharest, Romania.

Research areas: Theoretical computer science, algorithms and combinatorics on words, algorithms and data structures, automata theory and formal languages, computability and complexity theory.

Main results:

Characterizations of conventional complexity classes, like **P, NP**, or **PSPACE**, in terms of unconventional computational classes defined for bio-inspired models. The most relevant result proposes such a characterization of the important conventional complexity class **P^NP**[log], and is based on both a series of new results on classical computational models and on efficient simulations of Turing machines via bio-inspired models [9]. In [Loos, Manea, Mitrana, Small Universal Accepting Hybrid Networks of Evolutionary Processors, *Acta Inf.*, 2010], we constructed several succinct universal bio-inspired computational models.

Currently, I work on pattern matching algorithms and combinatorics on words (in one word, *stringology*). In [10] we have introduced and studied the notion of freeness of partial words, investigated then also in collaboration with other authors (e.g., in [8]).

I have initiated a thorough study of the algorithmic properties of generalised periodicities in words, looking for repeated occurrences of both a factor and its encoding under a very simple scheme. I showed together with my co–authors that, surprisingly, many relevant classes of generalised repetitions can be identified just as fast as conventional repetitions (see, e.g., [3]).

Extending the investigation of generalised repetitions to the study generalised patterns, I contributed to the design of efficient algorithm for locating in strings the occurrences of patterns with variables. For instance, in [6] fast matching algorithms were obtained for several special classes of patterns with variables which can be learned in polynomial time from sample sets. In [1], we solved an open problem central to the combinatorial pattern matching community by finding tight bounds on the number of α gapped repeats in a string and showing that they can all be identified in optimal time. I have contributed to the design of efficient algorithms locating generalised gapped repeats, or, in other words, one-variables patterns (see [4]).

A recent direction of research is the study of word equations with restricted form. I have studied the satisfiability of word equations whose sides are the subject of similar constraints. In a series of papers [Manea, Nowotka, Schmid, On the Solvability Problem for Restricted Classes of Word Equations, *DLT* 2016; Day, Manea, Nowotka, The Hardness of Solving Simple Word Equations, *MFCS* 2017] we have showed that even equations with a very simple structure are hard to solve. However, we have also developed a series of new techniques that can be used to show that the satisfiability of certain classes of equations is in **NP**.

Editor: *Algorithms* (open access journal, 2014–present).

Membership to professional organizations: European Association for Theoretical Computer Science (EATCS), Association for Computing Machinery

(ACM), Special Interest Group in Algorithms and Computation Theory (SIGACT), European Association for Computer Science Logic (EACSL), Computability in Europe Association (CiE), Gesellschaft für Informatik (GI).

Honors, awards: "Tudor Tănăsescu" Award (2009) of the Romanian Academy; "Prize of the Bucovinean Brothers Sârghie" for outstanding results – best graduate of the University (2003); Award for the best graduate of the Computer Science Department, Faculty of Mathematics & Computer Science, University of Bucharest, 2003.

Representative articles:

1. (with P. Gawrychowski, I. Tomohiro, S. Inenaga, D. Köppl) Tighter Bounds and Optimal Algorithms for all Maximal α–Gapped Repeats and Palindromes, *Theor. Comput. Syst*, 62, 1 (2018), 162–191. Extended version of a paper presented at the *33rd International Symposium on Theoretical Aspects of Computer Science*, *STACS* 2016.

2. (with M. Müller, D. Nowotka, S. Seki) The Extended Equation of Lyndon and Schützenberger, *J. Comput. Syst. Sci.*, 85 (2017), 132–167. Extended version of two papers presented at *39th International Symposium Mathematical Foundations of Computer Science, MFCS* 2014, and, respectively, *33rd IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science*, *FSTTCS* 2013.

3. (with H. Fernau, R. Mercaş, M.L. Schmid) Pattern Matching with Variables: Fast Algorithms and New Hardness Results, *Proc. 32nd International Symposium on Theoretical Aspects of Computer Science, STACS* 2015, *LIPIcs*, 30 (2015), 302–315.

4. (with M. Dumitran) Longest Gapped Repeats and Palindromes, *Proc. 40th International Symposium Mathematical Foundations of Computer Science, MFCS* 2015, *LNCS* 9234, Springer, 2015, 205–217.

5. (with M. Müller, D. Nowotka) Cubic Patterns with Permutations, *J. Comput. Syst. Sci.,* 81, 7 (2015), 1298–1310). Extended version of a paper presented at *16th International Conference on Developments in Language Theory*, *DLT* 2012.

6. (with P. Gawrychowski, D. Nowotka) Testing Generalised Freeness of Words, *Proc. 31st International Symposium on Theoretical Aspects of Computer Science*, *STACS* 2014, *LIPIcs* 25 (2014), 337–349.

7. (with J. Garcia-Lopez, V. Mitrana) Prefix-Suffix Duplication, *J. Comput. Syst. Sci.*, 80, 7 (2014), 1254–1265.

8. (with C. Tiseanu) The Hardness of Counting Full Words Compatible with Partial Words, *J. Comput. Syst. Sci.,* 79, 1 (2013), 7–22. Extended version of a paper presented at *4th International Conference Language and Automata Theory and Applications*, *LATA* 2010.

9. Complexity Results for Deciding Networks of Evolutionary Processors, *Theor. Comput. Sci.*, 456 (2012), 65–79. Extended version of a paper presented at *15th International Conference on Developments in Language Theory, DLT* 2011.

10. (with R. Mercaş) Freeness of Partial Words, *Theor. Comput Sci.*, 389, 1–2 (2007), 265–277.

Further information:

2016–2020: Board member of the European Association for Computer Science Logic (EACSL),

2016–2020: Chair of the Steering Committee of the conference series Computability in Europe, CiE, member of the Executive Committee and Council of the Association CiE.

Recent program committee membership: *22nd Developments in Language Theory – DLT* 2018, *14th Computability in Europe conference – CiE* 2018, *34th Intl. Symposium on Theoretical Aspects of Computer Science – STACS* 2017, *24th Intl. Symposium on String Processing and Information Retrieval – SPIRE* 2017.

h–index = 17, citations: 860 (according to Google Scholar).

Personal web page: http://flmanea.blogspot.com

MARCU, Daniel

Born on September 28, 1966, in Cluj-Napoca, Romania.

Education:
Facultatea de Automatizări şi Calculatoare, Cluj-Napoca (1986–1991).
Master in computer science, University of Toronto (1993–1994).
Executive MBA, University of California, Los Angeles (2007).

PhD in computer science, University of Toronto, 1994–1997. Thesis title: *The Rhetorical Parsing, Summarization, and Generation of Natural Language Texts*. Scientific advisor: Graeme Hirst.

Positions:
Information Sciences Institute, University of Southern California: Research Scientist (1998–2001), Research Project Leader (2001–2014), Director of Strategic Initiatives (2014–2018).

Computer Science Department, University of Southern California: Research Assistant Professor (1999–2006), Research Associated Professor (2006–2018).

Language Weaver Inc.: Founder and Chief Technology & Operations Officer (2002–2010), Chief Executive Officer (2007–2008).

SDL plc.: Chief Technology Officer, language technologies (2010–2012); Chief Science Officer (2012–2014).

Amazon: Director of natural language processing and machine translation (2016 – present).

Research areas: Natural language processing (machine translation, discourse, semantics, summarization, generation, question-answering), machine learning, education, reasoning, pragmatics.

Main results:
Transitioned advanced R&D concepts into commercial products and services that are used by more than 100 million people worldwide.

Builder and mentor of world-class R&D organizations (ISI/USC, Language Weaver, SDL, and Amazon).

Successful entrepreneur: co-founded Language Weaver Inc. and provided Series A investors with 10x returns via SDL acquisition exit (2010).

Editorial boards:

Advisory Board member of the *Journal of Artificial Intelligence*, JAIR (2007 – present); Associate editor of *AIJ* (2014–present); Associate editor of the *ACM Transactions on Speech and Language Processing* (2008–2013); Associate editor of *JAIR* (2004–2006).

Member of the editorial boards of the *Computational Linguistic*s (2001–2003) and *Computational Intelligence* (2004–2006) journals.

Membership to professional organizations: ACL and AAAI.

Honors, prizes, scientific distinctions:

ACL Fellow, for significant contributions to discourse parsing, summarization, and machine translation and to kick-starting the statistical machine translation industry (2014).

Named the 2013 R&D Professional of the Year by the Golden Bridge Awards.

Nominated by the European Patent Office for the 2013 European Inventor Award based on a 2003 invention and its benefit to society, economic success, and technological impact.

The "Grigore C. Moisil" Prize of the Romanian Academy, 2000.

Co-author of papers that received Best Paper Awards at the National Conference on Artificial Intelligence (AAAI 2000), the Annual Meeting of the Association for Computational Linguistics (ACL 2001), and the International Semantic Web Conference (ISWC 2015).

PhD students: Jason Riesa (2012) – now at Google, Alex Fraser (2007) – now at U of Munich, Dragoş Ştefan Munteanu (2006) – now at SDL plc., Hal Daume (2006) – now at U of Maryland, Radu Soricuț (2006) – now at Google.

Books:

1. *The Theory and Practice of Discourse Parsing and Summarization*, The MIT Press, 2000.

Representative articles:

1. (with K. Tran, Y. Bisk, A. Vaswani, K. Knight) Unsupervised Neural Hidden Markov Models, *Proc. EMNLP'2016 Workshop on Structured Prediction for NLP*, 2016, 63–71.

2. (with Y. Bisk, D. Yuret) Natural Language Communication with Robots, *Proc. NAACL'2016,* 751–761.

3. (with M. Dreyer) HyTER: Meaning-Equivalent Semantics for Translation Evaluation, *Proc. NAACL*, 2012*,* 162–171.

4. (with H. Daume III, J. Langford) Search-Based Structured Prediction, *Journal of Machine Learning*, 2009, 297–325.

5. (with R. Şoricuț) Stochastic Language Generation Using WIDL-Expressions and Its Application in Machine Translation and Summarization, Proc. COLING–ACL, 2006, 1105–1112.

6. (with H. Daume III) Domain Adaptation for Statistical Classifiers, *Journal of Artificial Intelligence Research*, 26 (2006), 101–126.

7. (with M. Galley, M. Hopkins, K. Knight) What's in a Translation Rule? *Proc. HLT/NAACL*, 2004, 961–968.

8. (with U. Germann, M. Jahr, K. Knight, K. Yamada) Fast and Optimal Decoding for Machine Translation, *Artificial Intelligence*, 154, 1–2 (2003), 127–143.

9. (with J. Burstein, K. Knight) Finding the WRITE Stuff: Automatic Identification of Discourse Structure in Student Essays, *IEEE Intelligent Systems*, 2003, 32–39.

10. (with W. Wong). A Phrase-Based, Joint Probability Model for Statistical Machine Translation, *Proc. EMNLP 2002*, 133–139.

11. (with K. Knight) Summarization Beyond Sentence Extraction: A Probabilistic Approach to Sentence Compression, *Artificial Intelligence*, 139, 1 (2002).

12. Perlocutions: The Achilles' Heel of Speech Act Theory, *Journal of Pragmatics*, 32 (2000), 1719–1741.

13. Building Up Rhetorical Structure Trees, *Proc. AAAI 1996*, 1069–1074.

Further information:

Author of more than 100 refereed publications and awardee of more than 30 US Patents.

H-index = 60 (https://scholar.google.com/citations?user=ZilgdfsAAAAJ).

Personal web page: www.isi.edu/~marcu/

MARCUS, Solomon

Born on March 1, 1925, in Bacău, Romania, passed away on March 16, 2016, in Bucharest.

Education: Elementary and high school in Bacău, degree in mathematics at the Faculty of Sciences of the University of Bucharest (1945–1949).

PhD: Faculty of Sciences of the University of Bucharest, 1956. Thesis title: *Monotonic Functions of Two Variables*. Scientific advisor: Miron Nicolescu.

Positions: Assistant Professor in 1950, Lecturer in 1955, Associate Professor in 1964, Professor in 1966, and Professor Emeritus in 1991 – all within the Faculty of Sciences (later of Mathematics and Physics, of Mathematics-Mechanics, of Mathematics and Computer Science, or simply of Mathematics), of the University of Bucharest.

Research areas: Mathematical analysis, measure theory and general topology, (mathematical) linguistics, history and philosophy of mathematics, poetics, semiotics, theoretical computer science (automata and languages, combinatorics on words, infinite sequences), applications of mathematics and of linguistic tools to natural and social sciences, natural (DNA and membrane) computing. Deep interest for cultural and philosophical aspects of science, as well as for education.

Main results (in theoretical computer science):

– One of the first monographs in automata and formal language theory (*Finite State Grammars and Automata*, 1964; in Romanian).

– Contextual grammars, now called *Marcus contextual grammars*, form a well developed branch of formal language theory with motivations and applications in linguistics. The domain counts several hundred of papers, two monographs, about one dozen of PhD theses.

– Many bridges between general linguistics and automata and language theory, between real analysis and language theory.

– Active promoter of approaching various domains (action theory, economics, biology, teatre, folklore, poetics, chemistry, learning, medical diagnostic, and so on and so forth) with linguistics tools, especially with generative grammars.

– Constantly interested in the history of formal languages, in general and in Romania.

– In the last decades, participation to the growth of DNA computing and membrane computing areas, with several papers in both domains (establishing links between apparently independent areas, formulating research topics).

Editorial boards of journals: over 45, for various periods (in several cases, editor-in-chief or deputy editor-in-chief); among them: *Cahiers de Linguistique Théorique et Appliquée, Proceedings of the Romanian Academy, International Journal of Computer Mathematics, Theoretical Linguistics, Poetics Today, Revue Roumaine de Linguistique, Annals* of several universities from Romania, *Romanian Journal of Information Science and Technology, Fundamenta Informaticae, Grammars, Eratosthene, Advanced Studies in Mathematics and Logic, Symmetry, Culture and Science, Poetics, International Journal of Signs and Semiotic Systems, Discrete Mathematics, Foundations of Control Engineering, Association for Literary and Linguistic Computing Bulletin, Revue Roumaine de Mathématiques Pures et Appliquées.*

Membership to professional organizations (in several cases, honorary member or member of the leading councils): Balkan Semiotic Society, International Association for Visual Semiotics, Toronto Semiotic Circle, Como Semiotic Circle, Hungarian Semiotic Society, Romanian Mathematical Society, Romanian Union of Writers, Romanian Semiotic Society, Romanian Committee for the Club of Rome, Eratosthene Society (Switzerland), Leading Council of Black Sea University Foundation, International Symmetry Association, International Advisory Council of World Association for Mass-media Semiotic Global Communication, etc.

Honors, prizes, scientific distinctions:

– Member of the Romanian Academy (corresponding member in 1993, full member in 2001).

– Doctor honoris causa of Craiova University (1999), "Vasile Alecsandri" University of Bacău (2003), Petroşani University (2003), "Ovidius" University of Constanța (2005), West University of Timişoara (2009), "Apollonia" University of Iaşi (2013), "Agora" University of Oradea (2015).

– Honorary citizen of Bacău, Iaşi, and Botoşani.

– Romanian national medals, awarded by the president of Romania: "Ordinul Național Serviciu Credincios", commandor degree in 2000 and high officer degree in 2011, "Ordinul Național Steaua României", knight degree, 2015.

– The Royal *Nihil Sine Deo* Decoration, awarded in 2011 by the King Mihai I of Romania.

– Prize for mathematics for the year 1961 of the Ministry of Education, "Gheorghe Lazăr" Prize of the Romanian Academy (1967).

– Many prizes and diplomas awarded by cultural journals and institutions.

PhD students: more than 40 mathematicians and computer scientists have obtained the PhD title under his guidance. The Mathematics Genealogy Project (https://www.genealogy.math.ndsu.nodak.edu/id.php?id=49018) provides the following list of Romanian students: Răzvan Andonie (1984), Tudor Bălănescu (1986), Şerban Buzeţeanu (1988), Cristian Calude (1977), Alexandru Cărăuşu (1980), Rodica Ceterchi (1991), Vasile Coardoş (1984), Alexandru Dincă (1973), Liviu Dinu (2003), Mihai Dinu (1979), Vasile Ene (?), Marian Gheorghe (1991), Radu Gramatovici (2001), Cristian Kevorchian (1995), Mihaela Malița (1990), Margareta Mihalyi (?), Radu Nicolescu (1985), Stelian Niculescu (1980), Gabriel Orman (1973), Gheorghe Păun (1977), Emil Popescu (1974), Constantin Raischi (?), Ileana Streinu (1994), Monica Tătărâm (1984). Also non-Romanian students completed the PhD with him, e.g., Xuan My Nguyen (Vietnam) and Nicos Cosmas (Greece).

Books (author or coauthor of more than 60 books, of mathematics, computer science, linguistics, semiotics, applications of mathematics, history and philosophy of mathematics and culture, education – including handbooks for high schools and university students):

1. *Gramatici şi automate finite* (*Finite State Grammars and Automata*), The Publ. House of the Romanian Academy, Bucharest, 1964 (in Romanian).
2. *Algebraic Linguistics. Analytical Models*, Academic Press, New York, 1967.
3. *Introduction mathématique à la linguistique structurale*, Dunod, Paris, 1967.
4. *Poetica matematică* (*Mathematical Poetics*), The Publ. House of the Romanian Academy, Bucharest, 1970 (in Romanian, translated in German in 1973 and Serbo-Croatian in 1974).
5. *La sémiotique formelle du folklore. Approche linguistico-mathématique*, Klincksieck, Paris – The Publ. House of the Romanian Academy, Bucharest, 1978.
6. *Paradigme universale* (*Universal Paradigms*), Paralela 45 Publ. House, Bcuharest–Piteşti, 2011 (complete edition, 1100 pages; in Romanian).
7. *Words and Languages Everywhere*, Polimetrica Intern. Sci. Publisher, Milano, 2007.

Representative articles (out of the approximately 450 scientific papers, about 100 are papers in computer science; the complete list can be found in *Theoretical Computer Science*, vol. 701, November 2017, special issue in memory of Solomon Marcus edited by Gheorghe Păun, Ion Petre, Grzegorz Rozenberg, Arto Salomaa):

1. Contextual Grammars, *Revue Roumaine de Mathématiques Pures et Appliquées*, 14, 10 (1969), 1473–1482.
2. Metode matematice în studiul dramei. Strategia personajelor, I (Mathematical Models in the Study of Teatre. The Strategy of Characters), in *Metodologia istoriei şi a criticii literare*, Ed. Academiei, Bucureşti, 1969, 163–170.
3. (with S. Fotino) Gramatica basmului, I (The Fairy-Tales Grammar), *Revista de etnografie şi folclor*, 18, 4 (1973), 225–277.
4. Linguistic Structures and Generative Devices in Molecular Genetics, *Cahiers de Linguistique Théorique et Appliquée*, 11, 1 (1974), 77–104.

5. Linguistics as a Pilot Science, in *Current Trends in Linguistics*, Th. Sebeok, ed., Mouton, The Hague, 1974, 2871–2887.

6. Applications de la théorie des langages formels en économie et organisation, *Cahiers de Linguistique Théorique et Appliquée*, 13, 2 (1976), 583–594.

7. Darboux Property and Formal Languages, *Revue Roumaine de Mathématiques Pures et Appliquées*, 22, 10 (1977), 1449–1454.

8. (with Al. Balaban, M. Barash) Computer Programs for the Recognition of Acyclic Regular Isoprenoid Structures, *MATCH – Mathematical Chemistry*, 5 (1979), 239–261.

9. with C. Calude, Gh. Păun) The Universal Grammar as a Hypothetical Brain, *Revue Roumaine de Linguistique*, 24, 5 (1979), 479–489.

10. (with C. Calude, I. Țevy) The First Example of a Recursive Function which Is Not Primitive Recursive, *Historia Mathematica*, 6 (1979), 330–384.

11. Methaphor in Science. A Case Study, *European Journal for Semiotic Studies*, 2, 2 (1990), 231–238.

12. (with L. Kari, Gh. Păun, A. Salomaa) In the Prehistory of Formal Languages: Gauss Codes, *Bulletin of the EATCS*, 46 (1992), 124–139.

13. Contextual Grammars and Natural Languages, in *Handbook of Formal Languages*, G. Rozenberg, A. Salomaa, eds., vol. II, Springer, Berlin, 1997, 215–235.

14. (with C. Martín-Vide, Gh. Păun) Contextual Grammars as Generative Models of Natural Languages, *Computational Linguistics,* 24, 2 (1998), 245–274.

15. Language, at the Crossroad of Computation and Biology, in *Computing with Biomolecules. Theory and Experiments*, Gh. Păun, ed., Springer, Singapore, 1998, 1–34.

Further information:

– Hundred of invited lectures at universities and research institutions from all continents, and at international conferences.

– Chapters in many synthesis books and encyclopedias, also presented in such works.

– More than 40 collective volumes and special issues of journals edited.

– Thousands of articles in culture journals and volumes, prefaces of books, interviews, TV and radio programs participation.

– Has edited *Opere complete* (*Complete Oeuvres*) of several Romanian mathematicians: Dimitrie Pompeiu, Gr.C. Moisil, Miron Nicolescu, Alexandru Froda, Traian Lalescu.

– Several collective volumes and special issues of journals were published in his honor, during his life and after passing away.

Note: Main sources of information: *Întâlniri cu/Meetings with Solomon Marcus*, Spandugino Publishing House, Bucharest, 2011, Volume 1, section "Biography and General Data"; Wikipedia; Dorina N. Rusu, *Membrii Academiei Române. Dicționar 1866–2016*, The Publishing House of the Romanian Academy, Bucharest, 2016, Volume 2.

MASALAGIU, Cristian-Dumitru

Born on August 28, 1953, in Iaşi, Romania.

Education:

1972–1976: BSc, Faculty of Mathematics, Computer Science Department, "Al.I. Cuza" University of Iaşi, Romania.

1976–1977: MSc Faculty of Mathematics, Computer Science Department, "Al.I. Cuza" University of Iaşi, Romania.

PhD: "Al.I. Cuza" University of Iaşi, Romania, 1986. Thesis title: *The Construction and Utilization of Some Relational Databases. Generalized Functional Dependencies and Information Protection*. Scientific advisor: Adolf Haimovici.

Positions

1986–1990: Assistant Professor, Faculty of Mathematics, Computer Science Department, "Al.I. Cuza" University of Iaşi, Romania.

1990–1993: Lecturer, Faculty of Mathematics, Computer Science Department, "Al.I. Cuza" University of Iaşi, Romania (in present, Faculty of Computer Science emerged in 1992).

1993–2000: Associate Professor, Faculty of Computer Science, "Al.I. Cuza" University of Iaşi, Romania.

2000–2018: Professor, Faculty of Computer Science, "Al.I. Cuza" University of Iaşi, Romania.

Research areas:

In the past: formal languages, relational databases, theory of algorithms, computability and complexity of algorithms, theory of distributed and concurrent systems, abstract data types, functional and logic programming, Petri nets.

In the present: classical logic, specification and verification of (safety critical) reactive systems, logics of belief (and other non-classical and higher-order logics) in information security, modern didactic methods for teaching computer science.

Main results:

I have introduced (sometimes in collaboration) and studied some general concepts, such as: time-variant (regular) languages, generalized functional dependencies for relational databases (PhD thesis), Nivat processing systems, relation based (or jumping) controlled Petri Nets.

Administrative positions: 1996–2000: vice-dean (head of the Scientific Department, Faculty of Computer Science, "Al.I. Cuza" University of Iaşi).

Editorial boards (for various periods): *Zentralblatt für Mathematik, American Mathematical Society, Scientific Annals of the "Al.I. Cuza" University of Iaşi,* Romania.

Books:

1. *Fundamentele logice ale informaticii*, Editura Universității "Al.I. Cuza", Iaşi, România, 2004.
2. (main co-author) *Didactica predării informaticii*, Editura POLIROM, Iaşi, România, 2004.
3. (main co-author) *Didactica predării informaticii*, Editura POLIROM (Metodică, Colecția Collegium), Iaşi, România, 2016.

Representative articles:

1. (with S. Istrail) Nivat-Processing Systems: Decision Problems Related to Protection and Synchronization, *Theoretical Computer Science*, 26 (1983), 97–103.
2. (with T. Jucan and F.L. Țiplea) Conditional Petri Net Languages, *Journal of Information Processing and Cybernetik* (*E.I.K.*), 27, 1 (1991), 55–66.
3. (with Ş. Andrei) About the Collatz Conjecture, *Acta Informatica*, 35 (1998), 167–179.
4. (with V. Alaiba) Logic Engineering with Application to Security, *Proceedings of the Romanian Academy* (Series A: Mathematics, Physics, Technical Sciences, Information Science), 13, 2 (2012).
5. (with W.N. Chin, Ş. Andrei, V. Alaiba) A Rigorous Methodology for Specification and Verification of Business Processes, *Formal Aspects of Computing*, 21, 5 (2009).

Personal web page: https://profs.info.uaic.ro/~masalagiu/

MATEESCU, Alexandru

Born on September 20, 1952, in Buşteni, Prahova, passed away on January 23, 2005, in Bucharest.

Education: High school in Buşteni, Faculty of Mathematics and Computer Sciences of the University of Bucharest (graduated in 1975).

PhD: Faculty of Mathematics of the University of Bucharest, 1985. Thesis title: *The Generative Complexity of Recursively Enumerable Sets Using Van Wijngaarden Systems.* Scientific advisor: Constantin Popovici.

Positions: Programmer in the Computer Center of the Mining Ministry in Bucharest (1975–1979), Assistant Professor (1979–1990), Lecturer (1990–1995), Associate Professor (1995–2000), Professor (2000–2005) at the Faculty of Mathematics of Bucharest University. In 1990 he has left Romania and, after a stage in Austria, he arrived in Finland, first in Joensuu and then in Turku, where he worked in the group of professor Arto Salomaa until 1999.

Research areas: Automata and language theory, the syntax of programming languages, contextual grammars, grammar systems, combinatorics on words, natural computing (DNA computing), computational linguistics.

Main results:

– The research related to his PhD thesis was dedicated to Van Wijngaarden grammars (two-level grammars), meant to describe the syntax of programming languages.

– One of the most successful notions introduced by Alexandru Mateescu was that of *shuffle on trajectories* (two words are shuffled under the control of a third word, called *trajectory*). The idea was investigated both algebraically and as a core operation of a generative device, in particular, in the framework of contextual grammars and grammar systems.

– Another notion introduced by Alexandru Mateescu which was investigated by many authors, some of them in collaboration with him, was an extension of the classic Parikh mapping to what he has called *Parikh matrix*.

– Mateescu was one of the first formal language theorists interested in DNA computing. The notion of *simple splicing systems* is the main contribution to this area, defined together with Gh. Păun and Arto Salomaa, and then investigated by many researchers.

Honors:

– Honorary citizen, post-mortem, of Buşteni town.

– In 2005, a special issue of *Fundamenta Informaticae* was edited (by Gh. Păun, G. Rozenberg, A. Salomaa), dedicated to the memory of Alexandru Mateescu, with the title "On Trajectories of Language Theory".

– In 2015, the volume *Discrete Mathematics and Computer Science. Papers in Memoriam Alexandru Mateescu (1952–2005)* was edited (by Gh. Păun, G. Rozenberg, A. Salomaa) and published by The Publ. House of the Romanian Academy, Bucharest.

PhD students: Daniel Claudian Voinescu started the PhD studies with him and completed them with Victor Mitrana.

Books:

1. (with D. Vaida) *Limbaje formale şi tehnici de compilare. Aplicaţii ale algebrelor multisortate în informatică* (*Formal Languages and Compiling Techniques. Computer Science Applications of Multisorted Algebras*) (Caietul I), Universitatea din Bucureşti, 1982.

2. (with D. Vaida) *Limbaje formale şi tehnici de compilare. Capitole speciale de limbaje formale* (*Formal Languages and Compiling Techniques. Selected Chapters of Formal Languages*), Universitatea din Bucureşti, 1984.

3. (with D. Vaida) *Limbaje formale şi tehnici de compilare. Capitole speciale* (*Formal Languages and Compiling Techniques. Selected Chapters*) (Caietul III), Universitatea din Bucureşti, 1988.

4. (with D. Vaida) *Limbaje formale şi tehnici de compilare. Nedecidabilitate în teoria limbajelor. Semantica parţial aditivă* (*Formal Languages and Compiling Techniques. Undecidability in Formal Language Theory. Partially Additive Semantics*) (Caietul III, Partea I), Universitatea din Bucureşti, 1989.

5. (with D. Vaida) *Structuri matematice discrete. Aplicaţii* (*Discrete Mathematical Structures. Applications*), Editura Academiei Române, Bucureşti, 1989.

Representative articles:

1. The Splendour of an Old Ballad: Aad van Wijngaarden Grammars, *Bulletin of the EATCS*, 49 (1993), 130–142.

2. (with A. Salomaa, K. Salomaa, S. Yu) Lexical Analysis with a Simple Finite Fuzzy-Automaton Model, *Journal of Universal Computer Sci.*, 1, 5 (1995), 292–311.

3. CD Grammar Systems and Trajectories, *Acta Cybernetica*, 13, 2 (1997), 141–157.

4. (with G. Rozenberg, A. Salomaa) Geometric Transformations on Language Families: The Power of Symmetry, *Int. J. Found. Comput. Sci*., 8, 1 (1997), 1–14.

5. (with G. Rozenberg, A. Salomaa) Shuffle on Trajectories: Syntactic Constraints, *Theoretical Computer Science*, 197, 1–2 (1998), 1–56.

6. (with Gh. Păun, G. Rozenberg, A. Salomaa) Simple Splicing Systems, *Discrete Applied Mathematics*, 84, 1–3 (1998), 145–163.

7. (with M. Kudlek) Algebraic, Linear and Rational Languages Defined by Mix Operation, *Fundamenta Informaticae*, 33, 3 (1998), 249–264.

8. (with G. Rozenberg, A. Salomaa) Shuffle on Trajectories: Syntactic Constraints, *Theoretical Computer Science*, 197, 1–2 (1998), 1–56.

9. (with P. Dömösi) On Slender Context-Free Languages, in *Recent Topics in Mathematical and Computational Linguistics*, C. Martín-Vide, Gh. Păun, eds*.,* Ed. Academiei Române, 2000, 97–103

10. (with A. Salomaa, K. Salomaa, S. Yu) A Sharpening of the Parikh Mapping, *R.A.I.R.O*., 35, 6 (2001), 551–564.

11. (with A. Salomaa) Matrix Indicators for Subword Ambiguity, *Int. J. Found. Comput. Sci*., 15, 2 (2004), 277–292.

12. (with A. Salomaa, S. Yu) Subword Histories and Parikh Matrices, *J. Comput. Syst. Sci.*, 68, 1 (2004), 1–21.

13. Algebraic Aspects of Parikh Matrices, in *Theory Is Forever. Essays Dedicated to Arto Salomaa on the Occasion of His 70th Birthday*, J. Karhumäki *et al*. eds., *LNCS* 3113, Springer, 2004, 170–180.

Further information:

– In the beginning of 1990, he was involved in introducing the internet in Romania.

– A great lover of mountain climbing and of skying.

MĂRUŞTER, Ştefan

Born on May 9, 1937, in Ineu, Arad county, Romania, passed away on December 24, 2017, in Timişoara.

Education: MSc degree in mathematics (1956–1960), Pedagogic Institute Timişoara (in present, West University of Timişoara), Romania.

PhD: "Babeş-Bolyai" University Cluj-Napoca, 1974. Thesis title: *Numerical Methods for Monotone Operator Equations.* Scientific advisor: Dimitrie D. Stancu.

Positions:

Associate Professor (1981–1991), Lecturer (1972–1981), Professor (1991–2002), Professor Emeritus (2002–2017), Department of Computer Science, Faculty of Mathematics and Computer Science, West University of Timişoara, Romania.

Professor of mathematics (1960–1965), in a high school from Baia Mare, Romania. Researcher (1965–1972), Computing Center of Polytehnical Institute Timişoara (MECIPT). Senior Researcher (2002–2017), Research Institute e-Austria Timişoara (IeAT).

Research areas: Operating systems, programming languages, compilers; theory of computing, formal languages; mathematics of computation: numerical methods for nonlinear equations; convergence and stability; mathematical software; convex feasibility problem.

Main results: Demicontractive mappings (1977).

In several papers it is stated that demicontractive operators were introduced "independently by Măruşter and Hics-Kubikec" in the same year 1977 (the 1973 Măruşter paper published in Canada where he introduced this class is less cited); in some papers the result from *Proc. Amer. Math. Soc.*, cited above, is quoted as "Măruşter's theorem".

Administrative positions:

Dean (1990–1991), Faculty of Mathematics and Computer Science, West University of Timişoara, Romania.

Director of Computer Science Research Center, West University of Timişoara (1999–2010).

Head of Computer Science Department (1991–1996), Faculty of Mathematics and Computer Science, West University of Timişoara.

Director of Computing Center, West Unversity of Timişoara (1980–1990).

Editorial boards: *Annals of the West University of Timişoara, Mathematics and Computer Science series; Fixed Point Theory* (UBB, Cluj-Napoca); *Revue d'analyse numerique et de la théorie de l'approximation* (UBB, Cluj-Napoca).

Membership to professional organizations: Mathematics Romanian Society.

Honors, prizes, scientific distinctions: Professor Honoris Causa, "Babeş-Bolyai" University Cluj-Napoca, 2016.

PhD students: Dana Petcu (1994), Octavian Cira (1998), Ioan Despi (1998), Mircea Florin Drăgan (1998), Eugen Crețu (2000), Robert Reisz (2000), Teodor Florin Fortiş (2001), Lucian Luca (2002), Adriana Popovici (2003), Mircea Drăgan (2004), Călin Șandru (2004), Daniel Pop (2006), Cosmin Bonchiş (2009), Emil Horia Popa (2009), Cristina Popîrlan (Chițu) (2009), Cornel Izbaşa (2010).

Books:

1. *Elemente ale sistemului de operare SIRIS–3* (*Elements of SIRIS-3 Operating System*), Editura Facla, Timişoara, 1980.
2. *Metode numerice în rezolvarea ecuațiilor neliniare* (*Numerical Methods in Solving Non-Linear Equations*), Editura Tehnică, Bucureşti, 1981.

Representative articles:

1. Sur le calcul des zéros d'un opérateur discontinue par itérations, *Canad. Math. Bull.*, 16, 4 (1973), 541–544.
2. The Solution by Iteration of Nonlinear Equations in Hilbert Spaces, *Proc. Amer. Math. Soc*., 63, 1 (1977), 69–73.
3. (with C. Popîrlan) On the Mann-Type Iteration and the Convex Feasibility Problem, *J. Comput. Appl. Math*., 212, 2 (2008), 390–396.
4. (with C. Popîrlan) On the Regularity Condition in a Convex Feasibility Problem, *Nonlinear Anal*., 70, 5 (2009), 1923–1928.
5. (with C.E. Chidume) Iterative Methods for the Computation of Fixed Points of Demicontractive Mappings, *J. Comput. Appl. Math*., 234, 3 (2010), 861–882.
6. (with P.-E. Maingé) Convergence in Norm of Modified Krasnoselski-Mann Iterations for Fixed Points of Demicontractive Mappings, *Appl. Math. Comput*., 217, 24 (2011), 9864–9874.
7. (with L. Măruşter) Strong Convergence of the Mann Iteration for Alpha-Demicontractive Mappings, *Math. Comput. Modelling*, 54, 9–10 (2011), 2486–2492.

8. (with V. Berinde, I.A. Rus) An Abstract Point of View on Iterative Approximation of Fixed Points of Nonself Operators, *J. Nonlinear Convex Anal.*, 15, 5 (2014), 851–865.

9. (with L. Măruşter) On the Error Estimation and T-Stability of the Mann Iteration, *J. Comput. Appl. Math*., 276 (2015), 110–116.

10. Estimating the Local Radius of Convergence for Picard Iteration, *Algorithms* (Basel), 10, 1 (2017), paper No. 10, 11 pages.

11. (with V. Berinde, I.A. Rus) Saturated Contraction Principles for Non Self Operators, Generalizations and Applications, *Filomat*, 31, 11 (2017), 3391–3406.

Further information:

His influence on the early beginnings of computing (both hardware and software) in Romania was enormous. In addition, he pioneered and led the education of generations of beginning and advanced graduates in the area of computational mathematics and computer science through his professorship at the West University of Timişoara.

(Pages contributed by Viorel Negru, West University of Timişoara)

MERCAŞ, Robert

Born on April 8, 1981, in Paşcani, Iaşi, Romania.

Education: BSc in computer science, University of Bucharest, Faculty of Mathematics and Computer Science, 2000–2004.

MSc in theoretical computer science, University of Bucharest, Faculty of Mathematics and Computer Science, 2000–2004.

PhD: Universitat Rovira i Virgili, Tarragona, Spain, 2010. Thesis title: *Repetitions in Partial Words*. Scientific advisor: Francine Blanchet-Sadri.

Scholarships, postdoc stages:

2016: 24 months funding for the project *Big data: New Algorithmical Challenges* as a Newton International Fellowship from the Royal Society (only 6 months done).

2014: 18 months funding for the project *Algorithms and Data Structures on Faulty Sequences* by the P.R.I.M.E. program of DAAD with funds provided by the Federal Ministry of Education and Research and the EU's Seventh Framework Programme.

2013: 9 months position as an active researcher in the project *Algorithmic Combinatorics on Sequences* from the Deutsche Forschungsgemeinschaft.

2011: 2 years funding for the project *Partial words with restrictions on the unknown symbols* from the Alexander von Humboldt Foundation.

2010: 6 months position as an active researcher in a Rovira i Virgili University, Tarragona, Spain, project.

2010: 3 months mobility for European Doctorate from the Spanish Government.

2009: 1 year position as an active researcher in Rovira i Virgili University, Tarragona, Spain.

Positions: Loughborough University, UK, lecturer (since July 2016).

Research areas: Stringology, combinatorics on words, bioinformatics (algorithms), formal languages and automata, trace monoids, learning theory (pattern inference).

Main results:

– initiated together with Florin Manea the systematic study of avoidability of patterns on sequences with don't cares (partial words);

– showed together with Szilárd Fazekas that the absoluteness of inequalities between subword histories is undecidable even for binary alphabets;

– gave together with Jürgen Dassow and Florin Manea a characterization of regular languages of partial words;

– together with Aleksi Saarela, described a new technique for investigating avoidability of *k*-abelian repetitions;

– together with Paweł Gawrychowski, Florin Manea, Dirk Nowotka, and Cătălin Tiseanu gave efficient algorithms for the pattern matching problem in the context of pseudo-repetitions (word transformations that involve reversals and anti-morphisms);

– was involved in describing different alternative algorithms for DNA-sequence comparisons that involve missing information or local descriptors;

– investigated together with Henning Fernau, Florin Manea and Markus Schmid different effective algorithms for the characterization of descriptive patterns.

Administrative positions: Theoretical computer science research theme co-ordinator (dept. of Computer Science at Loughborough University).

Editorial boards: Guest Editor, *Journal of Discrete Algorithms* (Elsevier).

Membership to professional organizations: Computability in Europe (CIE) association.

PhD students: Laura Kate Hutchinson (started October 2017), Alex M.S. Smith (started October 2017), Gary Bennett (started October 2017).

Representative articles:

1. (with F. Manea) Freeness of Partial Words, *Theoretical Computer Science*, 389 (2007), 265–277.

2. (with F. Blanchet-Sadri) A Note on the Number of Squares in a Partial Word with One Hole, *RAIRO – Theoretical Informatics and Applications*, 43 (2009), 767–774.

3. (F. Blanchet-Sadri, J. Kim, W. Severa, S. Simmons, D. Xu) Avoiding Abelian Squares in Partial Words, *Journal of Combinatorial Theory*, Series A, 119, 1 (2012), 257–270.

4. (with P. Gawrychowski, F. Manea, D. Nowotka, C. Tiseanu) Finding Pseudo-Repetitions, *STACS* 2013, *LIPIcs*, 20, 257–268.

5. (with C. Choffrut) The Lexicographic Cross-Section of the Plactic Monoid Is Regular, *WORDS* 2013, *LNCS* 8079, Springer, 2013, 83–94.

6. (with J. Dassow, F. Manea) Regular Languages of Partial Words, *Information Sciences*, 268 (2014), 290–304.

7. (with P. Ochem, A. Samsonov, A. Shur) Binary Patterns in Binary Cube-Free Words: Avoidability and Growth, *RAIRO – Theoretical Informatics and Applications*, 48, 4 (2014), 369–389.

8. (with A. Saarela) 3-Abelian Cubes Are Avoidable on Binary Alphabets, *DLT* 2013, *LNCS* 7907, Springer, 2013, 374–383.

9. (with R. Grossi, C. Iliopoulos, N. Pisanti, S. Pissis, A. Retha, F. Vayani) Circular Sequence Comparison: Algorithms and Applications, *Algorithms for Molecular Biology*, 11, a. 12 (http://dx.doi.org/10.1186/s13015–016–0076–6).

10. (with G. Badkobeh, M. Crochemore) Counting Maximal-Exponent Factors in Words, *Theoretical Computer Science*, 658, Part A (2016), 27–35.

Personal web page: www.robertmercas.com

MIHALCEA, Rada Flavia

Born on March 26, 1974, in Cluj-Napoca, Romania.

Education: BSc in computer science and engineering, Technical University of Cluj-Napoca, Romania (1997); Master in computer science and engineering, Southern Methodist University (1999).

PhD in linguistics, Oxford University, 2010. Thesis title: *The Language of Humour*. Scientific advisor: Steven Pulman.

PhD in computer science and engineering, Southern Methodist University, 2001. Thesis title: *Turning Implicit Knowledge into Explicit Knowledge via Word Semantics: A Model for Information Retrieval*. Scientific advisor: Dan Moldovan.

Positions: Associate Professor (2013–2015), Professor (2015 – present), University of Michigan.

Assistant Professor (2002–2008), Associate Professor (2008–2013), University of North Texas.

Visiting Scholar, MIT Media Arts and Sciences, summer 2005.

Visiting Assistant Professor, University of Texas at Dallas, January – August 2002.

Research areas: Natural language processing, multimodal processing, computational social sciences, artificial intelligence, human-computer interaction, information retrieval.

Topics: computational sociolinguistics (cross-cultural value learning, text-based geolocation, language-based modeling of worldview, multimodal personality detection, deception detection); multimodal sensing and tracking of human behavior (deception, affect, stress, alertness); joint modeling of language and vision (text-video question answering, text-image similarity, image annotation); lexical semantics (semantic similarity, word sense disambiguation, lexical substitution); graph-based algorithms for natural language processing (text summarization, word sense disambiguation, key-phrase extraction, category assignment); multilingual natural language processing; text summarization and keyword extraction; multilingual subjectivity, sentiment, and emotion analysis; computational humor.

Editorial boards: *Journal of Artificial Intelligence Research* (2016–2019), *Computer Speech and Language* (2016–2018), *Transactions of the Association for Computational Linguistics* (2012–2015), *IEEE Transactions on Affective Computing*

(2012–2014), *Journal of Natural Language Engineering* (2006–2012), *Journal on Research and Language and Computation* (Springer, 2006–2011), *Computational Linguistics* (2005–2008), *Language Resources and Evaluation* (2005–2007), *Journal of Interesting Negative Results* (2005).

Guest editor: *Journal of Natural Language Engineering,* special issue on "Graph-Based Natural Language Processing", 2015 (with Z. Kozareva, V. Năstase); *Computer Speech and Language*, special issue on "Computational Treatment of Affect" (with A. Balahur, A. Montoyo), 2013; *Journal of Natural Language Engineering,* special issue on "Parallel Texts", 2005 (with M. Simard).

Membership to professional organizations: ACM (2012 – present); ACL (2008 – present); Advisory board of ACTNext (2017 – present); Advisory board of ACL/SIGLEX – the ACL Special Interest Group on Semantics and the Lexicon (2014 – present); Advisory board of ACL/SIGDAT – the ACL Special Interest Group on Data-Driven NLP (2009 – present); President of ACL/SIGLEX – the ACL Special Interest Group on Semantics and the Lexicon (2004–2007); John Benjamins series on Natural Language Processing, advisory board (2006 – present); Board member of ACL/SIGNLL – the ACL Special Interest Group on Natural Language Learning (2002–2010).

Honors, prizes, scientific distinctions:

Honorary Citizen of Cluj-Napoca, Romania, 2013.

Presidential Early Career Award for Scientists and Engineers (PECASE), 2009. Awarded by President Barack Obama.

Romanian Academy Award for Science and Technology, 2010.

UNT Early Career Award for Research and Creativity, 2009.

National Science Foundation (NSF) CAREER award, 2008.

Best paper award, ACM Conference on Pervasive Computing for Assistive Environments, 2016.

Best student paper award, IEEE International Conference on Semantic Computing, 2007.

Best paper award for the Natural Language Processing track, International Conference of the Florida Artificial Intelligence Research Society 2007.

Best paper award, second place, International Conference on Computational Linguistics and Intelligent Text Processing, 2007.

Award of research excellence, Computer Science and Engineering department, UNT, 2004.

Best paper award, International Conference of the Florida Artificial Intelligence Research Society, 1999 and 2000.

Outstanding graduate student award, Southern Methodist University, 2001.

PhD students: Mahmoud Azab, Paul Bara (co-advised with Mihai Burzo), MeiXing Dong, Aparna Garimella, Oana Ignat (co-advised with Jia Deng), Shibamouli Lahiri, Steven Wilson, Charlie Welch, Laura Wendlandt – current PhD students.

Postdoctoral fellows: Carmen Banea (2014–2018), Veronica Pérez-Rosas (2014–2017), Mohamed Abouelenien (2014–2017).

PhD students: Veronica Pérez-Rosas (2014), Bharath Dandala (2013), Carmen Banea (2013), Ravi Sinha (2013), Ben Leong (2012), Rajitha Schellenberg (2012), Michael Mohler (2012), Hakan Ceylan (2011), Samer Hassan (2011), Kino Coursey (2009), Andras Csomai (2008).

Books:

1. (with G. Ignatow) *An Introduction to Text Mining: Research Design, Data Collection, and Analysis*, SAGE, October 2017.
2. (with G. Ignatow) *Text Mining and Analysis: A Guidebook for the Social Sciences*, SAGE, May 2016.
3. (with D. Radev) *Graph-Based Natural Language Processing and Information Retrieval*, Cambridge University Press, April 2011.
4. (with M. Burzo, M. Abouelenien, V. Pérez-Rosas) *Multimodal Deception Detection*, book chapter in *Handbook of Multimodal-Multisensor Interfaces*, Morgan Claypool, 2017.
5. (with S. Hassan) *Similarity*, in *Oxford Handbook of Computational Linguistics*, Oxford University Press, 2017.

Representative articles:

1. (with A. Garimella, C. Banea) Demographic-Aware Word Associations, *Proc. International Conference on Empirical Methods in Natural Language Processing* (*EMNLP* 2017), Copenhagen, Denmark, September 2017.
2. (with V. Pérez-Rosas, K. Resnicow, S. Singh, L. An) Understanding and Predicting Empathic Behavior in Counseling Therapy, *Proc. Association for Computational Linguistics* (*ACL* 2017), Vancouver, Canada, August 2017.
3. (with X. Ruan, S. Wilson) Finding Optimists and Pessimists on Twitter, *Proc. Association for Computational Linguistics* (*ACL* 2016), Berlin, Germany, August 2016.
4. (with V. Pérez-Rosas, M. Abouelenien, Y. Xiao, C.J. Linton, M. Burzo) Verbal and Nonverbal Clues for Real-Life Deception Detection, *Proc. Conference on Empirical Methods in Natural Language Processing* (*EMNLP* 2015), Lisbon, Portugal, September 2015
5. (with V. Pérez-Rosas) Experiments in Open Domain Deception Detection, *Proc. Conference on Empirical Methods in Natural Language Processing* (*EMNLP* 2015), Lisbon, Portugal, September 2015.

6. (with F. Bulgarov, C. Caragea) Co-Training For Topic Classification in Scholarly Data, *Proc. Conference on Empirical Methods in Natural Language Processing* (*EMNLP* 2015), Lisbon, Portugal, September 2015.

7. (with V. Pérez-Rosas) Cross-Cultural Deception Detection, *Proc. Association for Computational Linguistics* (*ACL* 2014), Baltimore, MD, June 2014.

8. (with C. Akkaya, J. Wiebe) Iterative Constrained Clustering for Subjectivity Word Sense Disambiguation, *Proc. European Association for Computational Linguistics* (*EACL* 2014), Sweden, April 2014.

9. (with C. Strapparava) Lyrics, Music, and Emotions, *Proc. Conference on Empirical Methods in Natural Language Processing* (*EMNLP* 2012), Jeju Island, July 2012.

10. (with H. Ceylan) An Efficient Indexer for Large N-Gram Corpora, *Proc. Association for Computational Linguistics* (*ACL* 2011), 103–108, Portland, OR, June, 2011 (paper accompanied by demo).

Personal web page: https://web.eecs.umich.edu/~mihalcea/research.html

MITRANA, Victor

Born on June 26, 1958, in Bucharest, Romania.

Education: Faculty of Mathematics, University of Bucharest, 1981–1986.

PhD: Faculty of Mathematics, University of Bucharest, 1993. Thesis title: *Distributed Grammar Systems*, University of Bucharest. Scientific advisor: Gheorghe Păun.

Scholarships, postdoc stages:

Alexander von Humboldt Fellow, Magdeburg (June 1995 – December 1996), Hamburg (September – October 1999), Magdeburg (April – June 2008, March – May 2011), Potsdam (March – May 2014, May – July 2017).

Visiting researcher at the University of Turku, Finland (October – December 1996).

Visiting researcher at the Academy of Finland (June – July 1998).

Fellow of the Spanish Ministry of Education and Science (January 1999 – December 2000).

Visiting professor University "La Sapienza", Rome, Italy, (2001, 2008, 2011, 2014).

PIV fellow of the Catalan Government (open worldwide competition), Spain (January – December 2001, March – October 2010).

Ramon y Cajal researcher (open worldwide competition), Spanish Government (February 2003 – January 2008), Rovira i Virgili University, Tarragona, Spain.

Visiting researcher at the European Center of Excellence at the Hungarian Academy of Sciences, Computer and Automation Research Institute (September – October 2003).

Visiting professor at the Polytechnic University of Valencia (October 2008 – September 2009).

Visiting researcher of the Japan Society for Promotion of Science Fellow, Kyoto Sangyo University, Japan (August – September 2008).

Visiting researcher of the Åbo Akademi, Turku, Finland (September – November 2009).

Positions:

Assistant Professor (1991–1994), Lecturer (1994–1999), Associate Professor (1999–2002), professor (2002 – present), University of Bucharest, Faculty of Mathematics and Computer Sciences, Romania.

Visiting professor, Polytechnic University of Valencia, Spain (2008–2009).

Research areas:

Theory of computation (formal language theory, computability, classic and unconventional models of computation, computational and descriptional complexity, parallel and distributed computing).

Bio-inspired computing (DNA recombination, theoretical models and experiments, splicing systems, solving problems with DNA-based algorithms, computational models based on bio-operations, language-theoretical models of the genome evolution, structural linguistics of nucleic acids, membrane computing, computing with tissues, networks of bio-inspired processors).

Combinatorics on words (finite and infinite sequences, data structures and algorithms on words, DNA sequence analysis, subword complexity).

Natural language processing (parsing, mathematical developments and applications, pattern interpretation, tree-controlled grammars).

Main results:

Initiator or co-initiator of several parallel and distributed computing models: modular grammars (known today as distributed grammar systems), hybrid grammar systems, parallel communicating and distributed automata systems, pattern systems.

Co-initiator of some DNA computing models: networks of evolutionary/ splicing processors, evolutionary systems, accepting splicing systems.

I have introduced and studied several bio-inspired operations: hairpin completion, Watson-Crick superpositions, crossover, prefix-suffix duplication. I have defined distances based on these operations and proposed algorithms for computing them.

An extension of finite automata over groups and multiset automata.

Contributions to the combinatorics on words: results on infinite sequences of symbols ("self-adding", "self-reading"), a complete characterization of primitive morphisms.

Administrative positions:

President of the Computer Science Commission of CNATDCU (2010–2011).

Member of the Computer Science Commission of CNATDCU (2006–2010, 2012–2015).

Vice-president of the Computer Science Commission of CNATDCU (2016 – present).

Scientific expert of the Executive Unit for Financing Higher Education and Scientific Research, Ministry of Education and Research from Romania (2006–2011).

Director of the research center MOCALC (Models of Computation, Algorithms and Cryptography), University of Bucharest (2007 – present).

Director of the Doctoral School of Computer Science, University of Bucharest (2011 – present).

Member of the Senate of the University of Bucharest (2004–2008, 2012–2016).

Editorial boards: *Journal of Computational and Applied Mathematics* (Springer, associate editor), *Journal of Universal Computer Science* (Springer), *Journal of Automata, Languages, and Combinatorics* (University of Giessen, Germany), *Annals of the University of Bucharest* (Publishing House of the Bucharest University), *International Journal of Applied Mathematics and Engineering Sciences* (Serial Publications), *ISRN Computational Mathematics* (Hindawi Publishing Corporation).

Honors, prizes, scientific distinctions:

"Gheorghe Lazăr" Prize of the Romanian Academy, 1997.

I3 accreditation (open competition) granted by the Spanish Agency of Evaluation of Scientific Activity based on an international evaluation.

Accredited as *"Catedratico de universidad"* by the ANECA, Spain

Colloquium on the occasion of my 50th birthday, University of Magdeburg, Germany, 2008.

Volume 12 (2009) of *Romanian Journal of Information Science of Technology*, with the title *Language-Theoretic Models of Distributed Computing*, is a collection of papers in honour of my 50th birthday.

PhD students: Peter Leupold (2006), Florin Manea (2007), Remco Loos (2008), Armand–Mihai Ionescu (2008), Cristina Bibire-Tîrnăucă (2009), Maria Adela Grando (2009), Traian Virgil Şerbănuţă (2010), Daniel Claudian Voinescu (2010), Marius Dumitran (2010), Adrian Horia Dediu (2015), Ştefan Popescu (2010).

Books:

1. *New Developments in Formal Language Theory Inspired from Biology*, The Publishing House of the University of Bucharest, 2001.

2. *Bioinformatics*, L&S Infomat Publishing House, Bucharest, 1998 (in Romanian).

3. *The Challenge of Algorithms*, Agni Publishing House, Bucharest, 1995 (in Romanian).

Representative articles:

1. Hybrid Cooperating/Distributed Grammar Systems, *Computers and Artificial Intelligence*, 12 (1993), 83–88.

2. (with J. Dassow) Stack Cooperation in Multistack Pushdown Automata, *Journal of Computer and System Sciences*, 58 (1999), 611–621.

3. (with E. Csuhaj-Varjú) Evolutionary Systems: A Language Generating Device Inspired by Evolving Communities of Cells, *Acta Informatica*, 36 (2000), 913–926.

4. (with E. Csuhaj-Varjú, C. Martín-Vide) Multiset Automata, *Workshop on Membrane Processing*, *LNCS* 2235, Springer, 2001, 69–83.

5. (with R. Stiebe) Extended Finite Automata Over Groups, *Discrete Applied Mathematics*, 108 (2001), 287–300.

6 with J. Dassow, A. Salomaa) Operations and Language Generating Devices Suggested by the Genome Evolution, *Theoretical Computer Science*, 270 (2002), 701–738.

7. (with C. Martín-Vide, Al. Mateescu) Parallel Finite Automata Systems Communicating by States, *International Journal of Foundations of Computer Science*, 13 (2002), 733–749.

8. (with J. Castellanos, C. Martín-Vide, J.M. Sempere) Networks of Evolutionary Processors, *Acta Informatica*, 39 (2003), 517–529.

9. (with F. Manea, C. Martín-Vide) On Some Algorithmic Problems Regarding the Hairpin Completion, *Discrete Applied Mathematics*, 157 (2009), 2143–2152.

Personal web page: http://tcs.unibuc.ro/victor–mitrana/

MOISIL, Grigore C.

Born on January 10, 1906, in Tulcea, Romania, passed away on May 21, 1973, in Ottawa, Canada.

Education: Faculty of Sciences of the University of Bucharest (1923–1926), and also the Polytechnic School of Bucharest (1924 – not graduated), as well as courses of history of art, philosophy and sociology at the Central University Library .

PhD in mathematics at the University of Bucharest, 1929. Thesis title: *La mécanique analytique des systèmes continus*. In the evaluation commission there were professors Dimitrie Pompeiu, Gheorghe Ţiţeica, and Anton Davidoglu.

In 1931, he obtained in Bucharest his docent degree, with the thesis: *Sur une classe de systèmes d'équations aux dérivées partielles*.

Scholarships, postdoc stages: Paris (1930–1931, 1932), Rome (Rockefeller grant, 1931–1932).

Positions:

Associate Professor, then Full Professor (1932–1942), University of Iaşi.

Professor at the Faculty of Sciences (then of Mathematics–Mechanics) and at the Faculty of Philosophy of the University of Bucharest (1942–1973), at the Institute of Geology from Bucharest (1948–1951).

Ambassador of Romania at Ankara (1946–1949).

Research areas, main results:

Founder of the Romanian school of algebra of logic and of the algebraic theory of automatic mechanisms, he also has fundamental contributions to the mechanics of continous media, mathematical analysis, the partial derivative equations, mathematical physics, algebraic theory of automatic mechanisms, differential geometry, probability theory, algebra, mathematical linguistics and others. He was a pioneer of functional analysis application in mechanics and differential geometry. He has investigated the mechanics of continuous media, ondulatory mechanics of wave fields, functional differential geometry. He has obtained interesting results concerning noncommutative algebras, in representing infinite abelian groups. Between 1936 and 1946 he was concerned with applying algebraic methods in mathematical logic. He investigated the algebra of logic and the algebraic structure of propositional calculus. He proposed an algebraic model of tri– and tetra-valued Łukasiewicz logics, now called "Łukasiewicz-Moisil algebras". Starting with 1960 he was a

forerunner in the area of mathematical linguistics, being interested in automatic translation by means of computers, of logical models of languages, and other related topics.

Interested in the applications of mathematics and computers in humanistic sciences, history, archeology, music, graphics, as well as in medicine and pedagogy.

Administrative positions:

The chief of the Section of applied algebra of the Institute of Mathematics of the Romanian Academy (1948–1973).

In 1962 he organized the Computer Center of Bucharest University, whose director was until 1969, after that being the honorary director of the Center.

Editorial boards: *International Computing Center Bulletin, Automatics, Journal de Mécanique,* and many others.

PhD students: the Mathematics Genealogy Project (https://www.genealogy.math.ndsu.nodak.edu/id.php?id=105937), consulted in March 2018, indicates the following 8 PhD students: Aristide Deleanu (1961), George Georgescu (1975), Peter Hammer/Ivănescu (1966), Gheorghe Nadiu (1972), Ioan Purdea (1969), Sergiu Rudeanu (1964), Cristian Teodosiu (1966), Ioan Tomescu (1971).

Honors, prizes, scientific distinctions:

Member of the Romanian Academy since 1948.

Member of the Science Academies from Bologna, Messina (Italy), Warsaw (Poland, 1957), of the Royal Society of Sciences from Liège, of the International Institute of Philosophy from Paris (1965), of the French Mathematical Society, of the Oslo Association of Symbolic Logic.

Member of the executive committee of IFAC (International Federation of Automatic Control, 1961), vice-president of the International Association of History and Philosophy of Sciences (1969).

Doctor honoris causa of the Academy of Sciences from Bratislava.

Awarded with Emeritus Scientist Title (1964) and the State Prize of Romania (1964), as well as with the "St. Methodius and Cyril" Order of Bulgaria.

The I.E.E.E. (Institute of Electrical and Electronical Engineering from Baltimore, Maryland, USA) Computer Society granted post-mortem to Gr.C. Moisil the *Computer Pioneer Award* for 1996, "for the development of polyvalent logic switching circuits, the Romanian School of Computing, and support of the first Romanian computers". The Computer Pioneer medal was given to Ms. Viorica Moisil, Gr.C. Moisil's wife, by the director of the Institute, during a ceremony which took place in the Romanian government Victoria Palace in Bucharest, on March 15, 1998.

Books: He wrote over 300 papers and the following books:

1. *Sur une classe de systèmes d'équations aux dérivées partielles* (Docent thesis), 1931.

2. *L'algèbre de la logique*, 1935.

3. *Logique modale*, Ed. Monitorul Oficial şi Imprimeriile Statului, 1942.

4. *Introduction to Algebra. Rings and Ideals* (in Romanian), Ed. Academiei, 1954.

5. *Schemes with Direct Command with Contacts and Relays* (in Romanian), Editura Academiei, 1957.

6. *Algebraic Theory of Automatic Mechanisms* (in Romanian), Ed. Tehnică, 1959; translated into Russian 1963, Czech 1964, English 1969.

7. *Sequential Operation of Schemes with Ideal Relays* (in Romanian), Ed. Academiei, 1962.

8. *Circuits with Transistors I* (in Romanian), Ed. Academiei, 1961.

9. *Circuits with Transistors I I* (in Romanian), Ed. Academiei, 1962.

10. *Algebraická teorie automatü*, Praha, Natiladatelstvi ceskosloveskic Akademie Ved., 1964.

11. *Real Functioning of Schemes with Contacts and Relays* (in Romanian), Ed. Academiei, 1965.

12. *Algebraic Theory of Schemes with Contacts and Relays* (in Romanian), Ed. Tehnică, 1965.

13. *Old and New Essays of Non-Classical Logic* (in Romanian), Ed. Ştiinţifică, 1965.

14. *Courses for Engineers* at Yablonna, Poland, appeared in the volumes *Zastosomanie algebr Łukasiewicz do teorii ukladov* (I and II), 1966.

15. *Théorie structurelle des automates finis*, Ed. Gauthiers-Villars, Paris, 1967.

16. *Elements of Mathematical Logic and Set Theory* (in Romanian), Ed. Ştiinţifică, 1968.

17. *The Algebraic Theory of Switching Circuit,* Pergamon Press, 1969.

18. *Doubts and Certitudes* (in Romanian), Ed. Enciclopedică Română, 1970.

19. *Essais sur les logiques non-chrysippiennnes*, Ed. Academiei, 1972.

20. *Lectures on the Logic of Nuanced Reasoning* (in Romanian), Ed. Ştiinţifică şi Enciclopedică, 1975.

Further information:

Beginning with 1953, he travelled a lot, attending congesses of pure mathematics, applied mathematics, automatics, philosophy of science in almost all countries of Europe, of America and in Japan.

There are many references about Moisil's life and activity. Here are only a couple of titles: G. Georgescu, A. Iorgulescu, S. Rudeanu, "Grigore C. Moisil (1906–1973) and His School in Algebraic Logic", *International Journal of Computers, Communications & Control*, 1, 1 (2006), 81–99; S. Marcus, "Grigore C. Moisil: A Life Becoming a Myth", *International Journal of Computers, Communications &*

Control, 1, 1 (2006), 73–79; Viorica Moisil, *Once Upon a Time... Grigore Moisil* (*A fost odată... Grigore Moisil*), Bucharest, Curtea Veche, 2002; A. Iorgulescu, S. Marcus, S. Rudeanu, D. Vaida, eds., *Grigore C. Moisil and His Followers in the Field of Theoretical Computer Science*, The Publ. House of the Romanian Academy, Bucharest, 2007.

(Contributed by prof. Afrodita Iorgulescu, with additional information from Dorina N. Rusu, *Dicționar. Membrii Academiei Române. 1866–2010*, The Enciclopedic Publishing House, Bucharest, 2010.)

MOISIL, Ioana I.

Born on May 25, 1948, in Bucharest, Romania.

Education: MSc in mathematics-mechanics at the University of Bucharest, 1971.

Second specialisation, in informatics, at the Central Institute for Management (at present, ICI – National Institute for Research in Informatics), Bucharest, 1971–1972.

PhD in mathematics at the Romanian Academy, "Gheorghe Mihoc" Institute for Mathematical Statistics and Applied Mathematics, Bucharest, 1997. Thesis title: *Decision and Uncertainty in Risk Factor Analysis*. Scientific advisor: Tiberiu Postelnicu.

Scholarships and postdoc stages:

1991: Scientific degree from the Université Libre de Bruxelles, School of Public Health.

1995: Senior researcher grade I in informatics, at the ICI (Institute for Research in Informatics) Bucharest.

1990: documentation (2 weeks) in France, lat Assistance Publique – Hopitaux de Paris, medical informatics; 1991: documentation (1 week) in Swiss, canton Neuchatel, medical informatics and public administration; 1992: research fellowship (10 month) of the Selection Committee of the Office for Science Policy, Belgium; 1993: doctoral scholarship (3 months), Université Libre de Bruxelles, Belgium; 1995: research fellowship (3 months) from the World Bank at ULB–IRIDIA, Standards and Methodologies for Medical Informatics

Positions:

1971–1986: Programmer, then Expert Instructor at I.C.I., Bucharest.

1986–1989: Senior Mathematician at the "Carol Davila" Institute of Medicine and Pharmacy, Bucharest, department of Biophysics.

1989–1999: Senior Analyst Programmer at the Ministry of Health, Computing Center CCSSDM; 1997–1999 head of the group for research in Medical Informatics.

Lecturer (1999–2001), Professor (2001–2010 when retired) at the "Lucian Blaga" University of Sibiu, Faculty of Engineering, Department of Computing Science, and Associate Professor at the Faculty of Sciences, Department of Informatics.

2010 – present: Associate Senior Reesearcher at the Research Center for Informatics and Information Technology, Faculty of Sciences, "Lucian Blaga" University of Sibiu.

2016: Profesor Honoris Causa, "Agora" University, Oradea.

Research areas: Computer aided education and training, informatics in bio-medicine, nursing informatics, statistical modelling, artificial intelligence, decision making.

Editorial boards: *International Journal of Advanced Statistics and IT&C for Economics and Life Sciences* ("Lucian Blaga" Univ. of Sibiu, 2009–2011); *EMMIT 2007 – Euro-Mediterranean Medical Informatics and Telemedicine 3rd International Conference Proceedings* (volume editor, "Lucian Blaga" Univ. Publ. House, Sibiu, 2007); *Proceedings of the Medinf 2007 International Conference* (volume editor, "Lucian Blaga" Univ. Publ. House, Sibiu, 2007); *Lumina Slovei Scrise* (Editura TehnoMedia, Sibiu); *Physician and Technology. Biomedical Engineering and Informatics* (Czech Medical association J.E. Purkyne, Czech Republic); *International Journal of Biomedicine and Healthcare*; *Applied Medical Informatics.*

Membership to professional organizations:

Member honoris causa of the J.E. Purkyne Medical Association of Boemia – Boemia Society for Medical Bioengineering and Medical Informatics; associate member of EMA – EuroMISE Mentor Association, Prague, Czech Republic; 2002–2005 national delegate at the WG–IST, Telemedicine and persons with special needs EC–DG XIII; 2008–2011 Member EARLI (European Association for Research in Learning and Instruction); RoCHI ACM; founder and vice–president (1992–2010) of the Romanian Medical Informatics Society (SRIM); 1995–2010 president of the SIG for Nursing Informatics, SRIM; from 2017 honorary member of SRIM; member COPYRO; of the HIT Foundation Informatics and Telematics for Health, coordinator of educational and cooperation activities (until 2017); member of EFMI – WG informatics in nursing, Romanian representative (1995–2010); and of IMIA – Nursing Informatics Special Interest Group, Romanian representative (1995–2010); member of the ISCB national group; 1990–2004 scientific secretary of the Commission for Medical Informatics of the Romanian Academy (until it was dissolved); member of the International Institute of Tele-Medicine and Medical Informatics IITIM (Italia); member of ASTRA Sibiu.

Selection of research papers and book chapters:

1. (with F. Filip) Decision Support for Environmental Management, in *Enciclodedia of Life Sciences Support Systems*, A. Sydow, ed., EOLSS Publishers, UNESCO EOLSS, Environmental Systems, 2002, 13 pages.

2. E-Learning. Challenges and Opportunities, *Contributions to ICT Progress*, Editura Tehnică Bucureşti, Colectia Tehnologia Informatiei, 2007, 95–116.

3. ICNP and TELENURSE in Romania, *2nd TELENURSE European Conference*, 29–30 May 1998, Seisimbra (Lisbon), Portugal.

4. (with E. Jitaru) E-Health Progresses in Romania, *Proc. International Joint Meeting EuroMISE* 2004, 152 (published in *Int. J. of Medical Informatics*, 75, 3–4 (2006), 315–321).

5. Omul Gr.C. Moisil, Symp. "Spiritul moisilian pe meleaguri bihorene", at the centenary of Gr.C. Moisil, "Agora" University, Oradea, 2006.

6. (with I. Pah, D. Simian, C. Simian) Ant Colony Models for a Virtual Educational Environment Based on a Multi-Agent System, *Large-Scale Scientific Computing*, *LSSC* 2007, I. Lirkov, S. Margenov, J. Waśniewski, eds., *LNCS* 4818, Springer, 2008, 577–584.

7. A Model of the Student Behaviour in a Virtual Educational Environment, *Int. J. of Computers, Communications & Control*, III (2008), Suppl. issue: *Proceedings of ICCCC* 2008, 108–115.

8. Statistical Classification Techniques for Mining Clinical Data, *ICB seminar "Statistics and Clinical Practice",* Polska Akademia Nauk, Warsaw, 2008.

9. The Wonderful Adventures of the Mathematician in Logic-Land: From Łukasiewicz-Moisil Logic to Computers, *6th International Conference on Computers Communications and Control* (ICCCC), 2016.

Further information:

Contributor to the *Telemedicine Glossary* 3rd, 4th, 5th edition, Working document of EC, DG Information Society Technologies, Bruxelles, Belgium, 2001, 2002, 2003, and to the *Nursing and Informatics for the 21st Century*, by Charlotte A. Weaver, Connie W. Delaney, Patrick Weber, Robyn Carr, Editors, HIMSS, SUA, 2006 (HIMSS Book of the Year Award 2006).

MOLDOVAN, Grigor

Born on December 29, 1939, in Vadu Izei, Maramureş county, Romania.

Education: "Babeş-Bolyai" University, Cluj-Napoca, Faculty of Mathematics (1958–1963).

PhD: "Babeş-Bolyai" University, Cluj-Napoca, 1971. Thesis title: *S.N. Bernstein's Polynomials Generalizations*. Scientific advisors: Tiberiu Popoviciu and Dimitrie D. Stancu.

Scholarships, postdoc stages:
University of Bucharest, 1966, with acad. Gr. C. Moisil.
University of Praga, Czechoslovakia, 1968.
Université Scientifique et Médicale de Grenoble, Mathématiques appliquées–Informatique, 1973–1974.
University of Granada, Spain, 1998.
University of Szeged, Departament of Computer Science, Hungary, 2001.

Positions: Assistant (1963–1975), Lecturer (1975–1977), Associate Professor (1977–1990), Professor (1990–2009), Consulting Professor (2009 – present), "Babeş-Bolyai" University, Cluj-Napoca.
Temporary Teacher: General school of Vadu Izei, Maramureş county; Department of mathematics, 1956–1958.

Research areas: Approximation of functions by positive and linear operators, numerical calculus, distributed databases, formal and automated languages, computer algorithmic and programming.

Main results:
The research activity rendered in the writing of over 80 scientific papers published in specialized journals at home and abroad was first mainly directed to the approximation of functions by positive and linear operators, then to applied mathematics and then to information science. Most of the papers concern the production of algorithms, many of them written in various computer programming languages, regarding the improvement of the evaluations in the theory of approximation, or for numerical calculus and reorganization of databases or for issues related to distributed systems. Some of the results, such as those in the theory of

approximation, were especially appreciated by acad. A. Turan from Hungary and acad. Henri Villat from France and were published in recognized journals in this field. Over ten scientific articles, of which several were written with Sergiu Damian, concern the solution of optimal redistribution regarding the improvement of crowding phenomenon to occur during the redistribution of databases or, more generally, of services, in a distributed system.

Administrative positions:

Director of the Computer Center of the "Babeş-Bolyai" University of Cluj-Napoca, 1975–1992; President of the Scientific Council for Information Science in the university;

Dean of the Faculty of Business and Finance-Banking Studies, at the Higher School of Business, Alba Iulia, related to the Chambers of Commerce and Industry, 1996–2002 ;

Rector of the Higher School of Business, Alba Iulia, 2002–2003.

Editorial boards: *Studia Universitatis "Babeş-Bolyai"* (Cluj-Napoca, 1989), *Acta Universitatis Apulensis, Mathematics-Informatics* (Alba Iulia, 2001), *Broad Research in Artificial Intelligence and Neuroscience* (Ed. EduSoft, Bacău), *Broad Research in Accounting, Negotiation, and Distribution* (Ed. EduSoft, Bacău).

Membership to professional organizations: SIAM (1993), ACM (1995), AMS (1995); The National Association of Information Science of Romania – founding member.

Honors, prizes, scientific distinctions: Doctor honoris causa of "Agora" University, Oradea, 2013; Emeritus professor of "Babeş-Bolyai" University, Cluj-Napoca, 2012; Diploma of excellence, awarded by "1 Decembrie 1918" University of Alba Iulia; Anniversary Diplomas awarded by the Scientific Councils of ICI, 1980 and ITC, 1983; Honorary citizen of the birthplace location, Vadu Izei, Maramureş, 1993.

PhD students: Henri Luchian (1994), Alexandru Vancea (2000), Viorica Varga (2000), Boris Sîrbu (2001), Dan Mircea Suciu (2001), Ion Dziţac (2002), Mihai Rotaru (2002), Lehel Istvan Kovacs (2006), Adrian Rădulescu (2007), Ioana Micăuş (Zelina; 2008), Bogdan Pătruţ (2008), Horea Adrian Greblă (2008), Arpad Incze (2015).

Books:

1. *Logical Schemes and FORTRAN Programs* (in Romanian), Didactic and Pedagogical Publishing House, Bucharest, 1976 (188 pages).

2. *Basics of Information Science II* (in Romanian), Cluj-Napoca Univ., 1985 (286 pages).

3. (with M. Lupea, V. Cioban) *Formal and Automated Languages. A Collection of Problems* (in Romanian), Cluj University Press, Cluj-Napoca, 2000 (108 pages).

4. (with R. Joldeş, M. Văleanu) *Elements of Information Science* (in Romanian), DACIA Publishing House, Cluj-Napoca, 2004 (346 pages).

5. *Formal Languages and Automation Theory* (in Romanian), EduSoft Publishing House, Bacău, 2005 (160 pages).

6. (with I. Dziţac) *Distributed Systems. Mathematical Models* (in Romanian), Agora University Press, 2006 (170 pages).

Representative articles:

1. On the Continuous Functions Approximation Through Bernstein. Polynomials (in Romanian), *Studia Univ. "Babeş-Bolyai", Series Math.-Physica*, 11, 1 (1966), 63–71.

2. Convergency of Certain Convolution Operators (Sur la convergence de certains opérateurs convolutifs positives), *C. R. Hebd. Acad. Sci. Paris, Série A–B*, 272 (1971), A, 1311–313.

3. Discrete Convolutions and Linear Positive Operators I, *Annales Univ. Sci. Budapesta de Rolando Eötvös nomin., Section Math.*, 15 (1972), 31–44.

4. Convergence of Strings of Convolution Operator Values in $\boldsymbol{R}^m$, *Studia Univ. "Babeş–Bolyai", Series Math.–Mec.*, 18, 1 (1973), 69–80.

5. (with P.T. Mocanu, M.O. Reade) Numerical Computation of the α-Convex Koebe Function, *Studia Univ. "Babeş-Bolyai", Series Math.–Mec.*, 19, 1 (1974), 37–46.

6. Positive Convolution Operators (Operateurs convolutifs positifs), *Séminaire d'Analyse Numérique, Grenoble, Université Scientifique et Médicale de Grenoble. Mathématiques appliquées – Informatique*, 1973/1974, 1–34.

7. Evaluation of Approximation Error of a Continuous Function by Means of Positive Linear Operators (L'évaluation de l'erreur de l' approximation d'une fonction continue par certain operateurs lineaires positives), *Mathematica,* 22(45), 1 (1980), 85–95.

8. Algebraic Properties of a Class of Positive Convolution Operators (in Romanian), *Studia Univ. "Babeş–Bolyai", Series Math*., 26, 1 (1981), 9–14.

9. Binary Recursively Defined Objects, *Analele Ştiinţifice ale Universităţii "Al.I. Cuza" din Iaşi (Serie nouă) Informatică*, XV (2005).

10. (with M. Văleanu) Redistributing Databases in a Computer Network, *Analele Univ. Bucureşti, Ser. Math.–Info.*, 56 (2006).

11. (with I. Zelina, I. Taşcu) On Embeddings of Hamiltonian Paths and Cycles in Extended Fibonacci Cubes, *American Journal of Applied Sciences*, 5, 11 (2008), 1605–1610.

12. (with S. Cosma, M. Văleanu, D. Cosma, D. Vasilescu) Efficient Data Organisation in Distributed Computer Systems Using Data Warehouse, *Int. J. Comput. Comm.*, 8, 3 (2013).

Further information:

At local and national level, I made the first steps in information science: first articles including algorithms in the form of programs (Algol–60, Fortran etc.) run on a computer; the first book in Romania on *Logical Schemes and Fortran Programs*, published by the Didactic and Pedagogical Publishing House, Bucharest, 1978. Several papers where new notions and concepts were presented (positive convolution operators, binary recursively defined objects, optimizations in distributed data-bases, etc.)

For 18 years (1974–1992), I put the basis and led the Computer Centre of the "Babeş-Bolyai" University of Cluj-Napoca.

I took part in 12 grants and 29 research contracts.

I was member in PhD commissions of 58 candidates in Romania and abroad, member of 55 hiring commissions in higher education.

NEGRU, Viorel

Born on September 16, 1955, in Poiana, Arad county, Romania.

Education: Undergraduate and Master degree in computer science (October 1975 – July 1979), West University of Timişoara, Romania.

PhD: "Babeş-Bolyai" University Cluj-Napoca, 1996. Thesis title: *Object-Based Knowledge System. A Distributed Model for Problem Solving*. Scientific advisor: Emil Muntean.

Scholarships, postdoc stages:

Postgraduate studies in distributed systems (October 1991 – March 1992), University of Nice – Sophia Antipolis, France; Research stage (April 1992 – September 1992), École des Mines de Paris – Sophia Antipolis.

Postgraduate studies in database (one year), "Politehnica" University of Timişoara, 1985.

Postgraduate courses in minicomputers, Compute Science Regional Center Timişoara, 1982.

Positions:

Professor (since October 2001), Department of Computer Science, Faculty of Mathematics and Computer Science, West University of Timişoara, Romania.

Senior Researcher (since December 2002), Research Institute e-Austria Timişoara (IeAT).

Senior Researcher, Institut for Symbolic Computation (RISC) – Johannes Kepler University of Linz, Austria (summer 1993, winter 1994, winter 1995, winter 1996).

Associate Professor (October 1997 – September 2001), Lecturer (October 1990 – September 1997); Assistant Professor (September 1986 – August 1990), Department of Computer Science, Faculty of Mathematics and Computer Science, West University of Timişoara, Romania.

Analyst-Programmer (January 1980 – August 1986), Computing Center, West University of Timişoara, Romania.

Research areas: Artificial intelligence, knowledge representation, intelligent systems, multi-agent systems, inteligent ambient, computational mathematics.

Main results: Intelligent front-ends for scientific computing, multi-agent models and architectures (with application in scientific problem solving, games, stock market, AmI, cloud resources management, IoT etc.).

Administrative positions:

Senate president (since March 2016), vice-rector in charge with the research (March 2012 – February 2016), West University of Timişoara, Romania.

Dean (March 2008 – February 2012), vice-dean (March 2000 – February 2008), Faculty of Mathematics and Computer Science, West University of Timişoara, Romania.

Deputy manager – Technological Transfer (since December 2002), Research Institute e-Austria Timişoara (IeAT).

Director of CS Doctoral School, West University of Timişoara (2005–2008)

Head of Computer Science Department, (October 2002 – January 2008), Faculty of Mathematics and Computer Science, West University of Timişoara (2005–2008).

Editorial boards: *Annals of the West University of Timişoara, Mathematics and Computer Science series; Scalable Computing: Practice and Experience.*

Membership to professional organizations: Mathematics Romanian Society (since 1986), ARIA – Romanian Association for Artificial Intelligence (since 2011), Association for Computing Machinery (ACM, since 1995), SIGART, ACM's Special Interest Group on Artificial Intelligence (since 2005), Society for Industrial and Applied Mathematics (SIAM, from 1995 to 1999), Computer Society (since 1996), IEEE (since 1999), Computational Intelligence Society (since 2004), Communications Society (since 2007), Robotics and Automation Society (since 2010), Signal Processing Society (since 2014), EuroScience (since 2002).

Honors, prizes, scientific distinctions:

"Traian Lalescu" Prize for "Mathematics and Natural Sciences", Gala of Banat Excellence, 2017.

PhD students: Cristian Mihai Cira (2010), Mihail Găianu (2011), Ciprian-Petrişor Pungilă (2012), Victor Ion Munteanu (2012), Liviu Octavian Scai (2013), Gabriel Iuhasz (2013), Monica Tirea (2013), Lavinia Cristina Moatar (2013), Ioan-Bogdan Manate (2014), Udrea Daniela (2015).

Books:

1. (with D. Petcu) *Distributed processing*, West University Pbs., 2001.
2. (with M. Marin, I. Dramnesc) *Principles and Practice of Functional Programming*, text-book, EUV, 2016.

Representative articles:

1. Non-Linear Equations Systems Solver, *Artificial Intelligence: Methodology, Systems, Applications; Frontiers in Artificial Intelligence and Applications series*, A.M. Ramsay, ed., IOS Press, 1996, 330–339.

2. (with D. Pop) Knowledge Management in Expert System Creator, *AIMSA* 2002, 233–242

3. (with C. Şandru) Validating UPML Concepts in a Multi-Agent Architecture, *Schedae Informaticae*, 15 (2006), 109–126.

4. (with D. Pop, F. Fortiş) Applying Ontologies for Workflow Modelling and Execution for a Virtual ISP, *International Journal of Web and Grid Services*, 4, 3 (2008), 330–341.

5. (with T.F. Fortiş, V.I. Munteanu) Towards an Ontology for Cloud Services, *2012 Sixth International Conference on Complex, Intelligent, and Software Intensive Systems*, Palermo, 2012, 787–792.

6. (with G. Iuhasz, M. Tirea) Neural Network Predictions of Stock Price Fluctuations, *14th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing*, SYNASC 2012, September 26–29, Timişoara, published in IEEE Computer Society Press, 505–512.

7. (with C.-P. Pungilă, M. Reja) Efficient Parallel Automata Construction for Hybrid Resource-Impelled Data-Matching, *Future Generation Computer Systems*, 36 (2014), 31–41.

8. (with G. Iuhasz, D. Zaharie) Neuroevolution Based Multi-Agent System with Ontology Based Template Creation for Micromanagement in Real-Time Strategy Games, *ITC* 43, 1 (2014), 98–109.

9. (with C. Pungilă, B. Manate) A Heterogeneous Fault-Resilient Architecture for Mining Anomalous Activity Patterns in Smart Homes, *CISIS–ICEUTE* 2015, 133–143.

NICOLESCU, Radu

Born on October 13, 1948, in Bucharest, Romania.

Education: Faculty of Mathematics, University of Bucharest (1966–1971).

PhD: University of Bucharest, 1985. Thesis title *Formal Languages and Programming Languages*. Scientific advisor: Solomon Marcus.

Positions:

1995–2018: Lecturer, Senior Lecturer, Dept. of Computer Science, The University of Auckland, New Zealand.

1991–1994: Software Project Leader, EFL and LISTEC Ges.m.b.H./GmbH, Wien, Austria and Lahr/Schwartzwald, Germany.

1989–1991: Software Developer, Wanko & Partner Ges.m.b.H., Salzburg, Austria.

1988–1989: Honorary Senior Researcher, Computing Research and Innovation Centre (SZKI), Budapest, Hungary.

1971–1988: Analyst, Senior Analyst (with part time teaching at the Faculty of Mathematics), Computing Centre of the University of Bucharest (CCUB), (Bucharest, Romania).

Research areas: Parallel and distributed computing, logical and functional programming, distributed deep learning, image processing, combinatorial optimizations, information coding and complexity, theory of computation, automata and formal languages, parsing and compiler construction.

Main results:

2014: Started to develop cP systems, a version of P systems with Prolog-like features (Auckland, New Zealand). Cf. representative articles.

1995: Proved several critical uniqueness results for T-codes (Auckland, New Zealand). Cf. representative articles.

1994: Lead the team that designed and developed software for an experimental robotic system for distributing and tracking tests in medical laboratories, presented at CeBIT 1990 (Hanover, Germany).

1990: Designed and developed fast software for vehicle routing and scheduling, presented at CeBIT 1990 (Hanover, Germany), used throughout Austria, Switzerland, Germany.

1985: Proved – under the supervision of prof. D. Vaida and S. Marcus – that the typical syntax of mainstream programming languages cannot be fully modelled by indexed grammars.

1976: Significant contributions to the design and implementation of PLUB (Programming Language of the University of Bucharest) (Bucharest, Romania).

Administrative positions:

2007–2015: Director of Communication and Information Technology Research Group (CITR), Dept of Computer Science, The University of Auckland, New Zealand.

2001–2007: Head judge at ACM South Pacific Programming Contest (SPPC), Auckland, New Zealand.

Editorial boards: *Journal of Membrane Computing* (Springer, from 2018).

Membership to professional organizations: IEEE, IEEE CS (1995–2017), ACM (1986–2017).

Honours, prizes, scientific distinctions:

2003: Michael Lennon Award – Excellence as Head Judge for ACM South Pacific Region, Auckland, New Zealand.

2001: Distinguished Teaching Award, The University of Auckland, New Zealand.

1999: Award of the Computer Science Department for Excellence of Teaching, Auckland, New Zealand.

1983: Award of the Ministry of Education for Excellence in Applied Research, Romania.

1966: First Place at the National Level, Mathematical Olympics Competition, Romania.

PhD students: Alec Henderson (2018 – started), James Cooper (2017 – started), Haokun Geng (2014–2017), Dongwei Liu (2014–2017), Huiling Wu (2012–2014), Yun Kim (2010–2013).

Representative articles:

1. Most Common Words – A cP Systems Solution, *LNCS* 10725, Springer, 2018, 214–229.

2. Revising the Membrane Computing Model for Byzantine Agreement, *Membrane Computing Conference*, Milan, Italy, *LNCS* 10105, Springer, 2017, 317–339.

3. (with D. Liu, R. Klette) Stereo-Based Bokeh Effects for Photography, *Machine Vision and Applications*, 27, 8 (2016), 1325–1337.

4. (with D. Vaida). Indexed Grammars, ET0L Systems and Programming Languages, *Discrete Mathematics and Computer Science. In Memoriam Alexandru Mateescu* (1952–2005) (Gh. Păun, G. Rozenberg, A. Salomaa, eds.), The Publ. House of the Romanian Academy, Bucharest, 2014, 241–258.

5. (with G. Gimel'farb, S. Ragavan) P System Implementation of Dynamic Programming Stereo, *Journal of Mathematical Imaging and Vision*, 47, 1–2 (2013), 13–26.

6. (with H. Wu) New Solutions for Disjoint Paths in P Systems, *Natural Computing*, 11, 4 (2012), 637–651.

7. (with M.J. Dinneen, Z.-B. Kim) P Systems and the Byzantine Agreement, *Journal of Logic and Algebraic Programming*, 79, 6 (2010), 334–349.

8. (with M.R. Titchener) Uniqueness Theorems for T-Codes, *Romanian Journal of Information Science and Technology*, 1, 3 (1998), 243–258.

9. (with U. Günther, P. Hertling, M. Titchener) Representing Variable-Length Codes in Fixed-Length T-Depletion Format in Encoders and Decoders 1 2, *Journal of Universal Computer Science*, 3, 11 (1997), 1207–1225.

10. (with T. Bălănescu, S. Gavrilă, M. Gheorghe, L. Sofonea) On Hartmann's Error-Recovery Scheme, *ACM SIGPLAN Notices*, 21, 12 (1986), 80–86.

Personal web page: https://www.cs.auckland.ac.nz/people/r–nicolescu

ORMAN, Gabriel V.

Born on November 15, 1933, in Bălți, Romania (now in Republic of Moldova).

Education: Faculty of Mathematics and Physics, "Victor Babeş" University of Cluj (1957).

PhD in mathematics at University of Bucharest, 1973. Thesis title: *Clasificări ale limbajelor liniare* (*Classifications of the Linear Languages*). Scientific advisor: Solomon Marcus.

Scholarships: University of Bucharest (1964); University of Bratislava, Czecho-Slovakia (1972). Visiting professor at University of Illinois, USA (1991).

Positions: Professor at a high school in Predeal (1957–1962). Assistant at the Faculty of Mathematics, Pedagogical Institute in Braşov (1962–1971). From 1971, Lecturer and then I climbed all steps in University of Braşov. From 1990, Professor at Faculty of Mathematics and Informatics, University of Braşov, now "Transilvania" University of Braşov.

Research areas, main results: The mathematical theory of formal languages, probability and applications to the study of the systems.

After 1975 I was interested in interdisciplinary domains involving algorithms of stochastic approximation, stochastic processes and applications to the study of the generative systems and the transmission of the information, of the genetic systems, applications in reliability, in the analysis of the economic systems and the problems of risk.

The scientific activity has been materialized in about 220–230 published scientific works (books, papers, textbooks) and also many papers for the popularization of the science. I gave over 250 conferences, scientific communications in Romania and also on the occasion of my visits to universities from Europe and USA.

I have been Gastprofessur at the University "Gerhard Mercator" from Duisburg, Germany, where I realized studies related to methods of stochastic approximation and I gave lectures on limit theorems and stochastic approximation to the students from Master degree (in 2001).

Administrative position: Head of the Department of Mathematical Analysis and Probability, "Transilvania" University of Braşov (1992–2004); President of the

University House from Braşov (1984–1992); Member in the Scientific Council of the Faculty of Mathematics and Informatics from Braşov; Member in the Senate of "Transilvania" University of Braşov; Member in the Council of Honorary of the Senate of "Transilvania" University of Braşov (up to 2004); Member (many years) of the Central Institute of Mathematics, Bucharest, representing the Faculty of Mathematics and Informatics from Braşov.

Editorial boards: I have edited the proceedings of the many conferences that I organized in our faculty: *Languages, Logic, Mathematical Linguistics* (periodical); *Symmetry and Anti-Symmetry in Mathematics, Formal Languages and Computer Science*" (periodical – satellite Conferences of ECM); *Mathematics and Its Applications*; Scientific Session dedicated to Grigore C. Moisil on the occasion of 100 years since his birth (April 2006).

Membership to professional organizations: European Mathematical Society; The Committee of Mathematical Linguistics of Romanian Academy; The Academy of Romanian Scientists; The Romanian Society of Mathematical Sciences; The Romanian Society of Probability and Statistics; The Romanian Society of Informatics – SOCROMINFO; International Scientific Committee of Balkan Conferences on Operational Research, Thessaloniki, Greece (1994–1999).

Honors, prizes, scientific distinctions: Centro Superiore di Logica e Science Comparate, Bologna – *Membro Consulente Aggregato* (1972); Honorary member, International Biographical Centre, Cambridge (1999).

PhD students: Dorin Bocu (1996), Patricia Giurgescu (1996), Eugen Păltănea (1997), Mircea Vîntu (1997), Mariana Neagu (1998), Călina Frandăş (1998), Viorel Drăghici (1999), Nicolae Bârsan Pipu (2000), Mihai N. Pascu (2002), Ovidiu Popescu (2004), Cristian Mihai Pomohaci (2004), Adriana Winter (Oprei; 2004), Iulian Marcel I. Adrian (2005), Doina Constanţa Mihai (2006), Constantin Lădescu (2006), Andreea Fulga (2007), Gabriel Lucian Nepotu (2008), Cristina Maria Vlădărean (2008), Mioara Varga (2008), Adela Ză ră (2009), Delia Maria Teselios (2009), Maria Alexandra Proca (2010), Mihail Ioan Pop (2012), Mioara Alina Nicolae (2012), Nadia Mirela Stoian (2012), Sorina Mihaela Stoian (2014), Neculai I. Crîşmaru (2014).

Books:

1. *Limbaje formale* (*Formal languages*), Editura Tehnică, Bucureşti, 1982.
2. *Capitole de Matematici Aplicate* (*Chapters of Applied Mathematics*), Editura Albastră, Micro-Informatica, Cluj-Napoca, 1999.
3. *Limbaje formale şi acceptori* (*Formal Languages and Acceptors*), Editura Albastră, Micro-Informatica, Cluj-Napoca, 2002.

4. *Aspects of Convergence and Approximation in Random Systems Analysis*, LAP LAMBERT Academic Publishing, 2012.

5. *Basic Probability Theory, Convergence, Stochastic Processes and Applications*, "Transilvania" University Press, Braşov, 2016.

Representative articles:

1. A Characterization of Left Linear Context-Free Languages, *Informatica* (Bled), 3 (1970).

2. Consideration sur les languages "Context-Free" linéaires à gauche et à droite, *Revue Roumaine de Math. Pures et Appl.*, XVI, 7 (1971), 1107–1114.

3. On the Characterization of Context–Free Languages, *Proc. VIIth Yugoslav International Symposium on Information Processing,* Bled, 1972, F 5 (1–8).

4. On the Complexity of Context-Free Grammars, *Informatica* (Ljubljana), 1975, B 3–21 (1–8);

5. Two Aspects Concerning "General Theory of Directed Numbers" by Franco Spisani and an Application, *International Logic Review* (Bologna), 32 (1985), 67–71.

6. On Some Numerical Functions Utilized in the Study of a Class of Discrete Systems, *Journal of Systems Science*, 19, 1 (1993), 27–37.

7. On the Characterization of Some Generative Grammars by Numerical Functions, *Current Issues in Mathematical Linguistics* (C. Martín-Vide, ed.), Elsevier Science, 1994, 151–160.

8. On Stochastic Approximation Methods in Reliability, *Invited Lecture & Preprint ICRSA* – 2003, University of South Carolina, Columbia, USA, May 2003.

9. On Stochastic Approximation Methods in Reliable Systems Analysis, *International Journal Communications in Dependability and Quality Management,* 9, 1 (2006), 38–44.

10. On Stochastic Calculus and Diffusion Approximation to Markov Processes, in *Chaos and Complex Systems* (S.G. Stavrinides, S. Banerjee, S.H. Caglar, M. Ozer, eds.), Springer, Berlin, 2013, 239–244 (in collab.).

Further information:

The book *Limbaje Formale* (*Formal Languages*), Ed. Tehnică, Bucureşti, 1982, is the first monograph in the Romanian language in which one discusses, into an unitary form, the languages from the Chomsky's hierarchy and the automata able to accept them. A new version, containing also new subjects, was published in 2002: *Limbaje formale şi acceptori* (*Formal Languages and Acceptors*), Grupul MicroInformatica, Cluj-Napoca, 2002.

Personal web page: http://cs.unitbv.ro/~orman

PAVEL, Ana Brânduşa

Born on April 12, 1986, in Bucharest, Romania.

Education:

Bachelor in computer engineering, Department of Computer Science, Faculty of Automatic Control and Computers, "Politehnica" University of Bucharest, Romania (2005–2009).

Bachelor in biochemistry and molecular biology, Department of Biochemistry, Faculty of Biology, University of Bucharest, Romania (2008–2011).

Master in intelligent control systems, Department of Automatic Control and Systems Engineering, Faculty of Automatic Control and Computers, "Politehnica" University of Bucharest, Romania (2009–2011).

PhD in bioinformatics, Graduate Program in Bioinformatics at Boston University, Boston, MA, USA, 2012–2017. Thesis title: *Multi-omics Data Integration for the Detection and Characterization of Lung Pathogenesis.* Scientific advisors: Avrum Spira and Marc Lenburg.

PhD in systems engineering, Department of Automatic Control and Systems Engineering, Faculty of Automatic Control and Computers, "Politehnica" University of Bucharest, Romania, 2011–2015. Thesis title: *Development of Robot Controllers Using Membrane Computing*. Scientific advisor: Ioan Dumitrache.

Scholarships, postdoc stages:

Postdoctoral Fellowship, Icahn School of Medicine at Mount Sinai, New York, NY, USA (2017 – present).

Summer Internship, Systems Biology, Translational Medicine, Takeda Oncology, Cambridge, MA, USA (May 16 – August 19, 2016).

Summer Internship, Translational Informatics, Oncology Translational Research, Novartis Institutes for Biomedical Research, Cambridge, MA, USA (May 15 – August 15, 2013).

PhD Research Fellowship, Computational Biomedicine, Boston University, Boston, MA, USA (2013-2017).

Dean's Fellowship, Graduate Program in Bioinformatics, Boston University, Boston, MA, USA (2012–2013).

Research Fellowship, Faculty of Philosophy and Science in Opava, Silesian University in Opava, Czech Republic (March 2012).

Summer Schools: First International School on Biomolecular and Biocellular Computing, Osuna, Spain, September 2011; Neuronal Dynamics Approaches to Cognitive Robotics Summer School, Institute für Neuroinformatik, Ruhr–Universität, Bochum, Germany, September 2010; Cooperative Cognitive Control for Autonomous Underwater Vehicles Summer School, Jacobs University, Bremen, Germany, July 2010.

Positions:

Postdoctoral Research Fellow, Icahn School of Medicine at Mount Sinai, New York, NY, USA (2017–present).

Research Assistant, Boston University School of Medicine, Boston, MA, USA (2013–2017).

Teaching and Research Assistant, "Politehnica" University of Bucharest, Romania (2009–2012).

Research areas: Cancer systems biology, translational bioinformatics, biomarker discovery, membrane computing, machine learning, mathematical modeling.

Main results:

Using high-throughput genomics data, I am developing novel personalized medicine approaches to improve therapeutic strategies for cancer and inflammatory diseases. I have contributed to over 30 scientific publications in the fields of engineering, bioinformatics and systems biology. I have developed new integrative approaches to predict drug response and cancer progression, including a novel molecular classifier for early detection of lung cancer. In addition, I have several contributions to membrane computing research field. I proposed enzymatic numerical P systems, a new type of P systems. This model is universal and can efficiently be used to define controllers for autonomous robots.

Membership to professional organizations:

Associate member of the American Association for Cancer Research (AACR), since 2014; American Thoracic Society trainee member, since 2014; European Network for the Advancement of Artificial Cognitive Systems, Interaction and Robotics (EUCog), since 2011.

Honors, prizes, scientific distinctions:

Travel Fellowship from National Eczema Association to attend the International Investigative Dermatology Meeting 2018, Orlando, FL, USA.

American Thoracic Society (ATS) Abstract Scholarship, Assembly on Thoracic Oncology Program, ATS International Conference 2017, Washington, D.C., USA.

Travel awards from the Bioinformatics Program at Boston University to attend 7 international meetings on cancer research and bioinformatics: American

Association for Cancer Research (AACR) Annual Meetings 2014 San Diego, CA; 2015 Philadelphia, PA; 2016 New Orleans, LA; 2017 Washington D.C.; American Thoracic Society (ATS) 2015 Denver, CO; Systems Approaches to Cancer Biology (SACB) 2017 Woods Hole, MA; International Workshop on Bioinformatics and Systems Biology (IBSB) 2013 Kyoto, Japan.

Award from the Romanian National Research Council for the publication of the article: A.B Pavel, C.I. Vasile, PyElph – a Software Tool for Gel Images Analysis and Phylogenetics, *BMC Bioinformatics,* 13, 9 (2012).

Provisional Patent: Methods Relating to Lung Cancer (US Application No.: 15877447, recorded at USPTO on January 23, 2018).

Books:

1. (with C.I. Vasile, I. Dumitrache) Membrane Computing in Robotics, book chapter in J. Kelemen, J. Romport, E. Zackova, eds., *Beyond Artificial Intelligence: Contemplations, Expectations, Applications* (Topics in Intelligent Engineering and Informatics), Springer, 2012.

2. (with C.I. Vasile, C. Buiu) *Biomathematics and Bioinformatics. Concepts and Applications* (in Romanian), Ed. Universitară, 2011 (222 pages).

3. (with C. Buiu, C. Vasile) *Cognitive Robots. Bio-inspired Applications* (in Romanian), Ed. Universitară, Bucharest, 2010 (188 pages).

4. (with C.I. Vasile) Robots with Cognitive Vision. Case Study Remaster One Robot, book chapter in C. Buiu, Ed., *Cognitive Robotics Concepts, Architectures, Applications* (in Romanian), Ed. Universitară, Bucharest, 2008.

Representative articles:

1. (with E. Guttman-Yassky, P. Brunner, A. Neumann, S. Khattri, J.G. Krueger, M. Lebwohl, *et al*.) Fezakinumab (anti–IL–22) in Moderate-to-Severe Atopic Dermatitis Patients, *Journal of the American Academy of Dermatology*, 2018.

2. (with J. Campbell, M. Lenburg, A. Spira, *et al*.) MicroRNA Expression in Bronchial Epithelium for Lung Cancer Detection*, Cancer Prevention Research* (AACR Journal), September 6, 2017.

3. (with S.K. Korolev) Genetic Load Makes Cancer Cells More Sensitive to Common Drugs: Evidence from Cancer Cell Line Encyclopedia, *Scientific Reports*, 7 (1938), Springer Nature, May 16, 2017

4. (with D. Sonkin, A. Reddy) Integrative Modeling of Multi-omics Data to Identify Cancer Drivers and Infer Patient-Specific Gene Activity, *BMC Systems Biology*, 10, 16 (2016).

5. (with J.L. Fleck, C.G. Christos) Integrating Mutation and Gene Expression Cross-Sectional Data to Infer Cancer Progression, *BMC Systems Biology*, 10, 12 (2016).

6. (with C.I. Vasile) Identifying Cancer Type Specific Oncogenes and Tumor Suppressor Genes in Limited Size Data*, Journal of Bioinformatics and Computational Biology*, 24 (2016).

7. (with C.I. Vasile, I. Dumitrache) Universality of Enzymatic Numerical P Systems, *International Journal of Computer Mathematics*, 90, 4 (2013), 869–879.

8. (with C.I. Vasile) PyElph – a Software Tool for Gel Images Analysis and Phylogenetics, *BMC Bioinformatics*, 13, 9 (2012).

9. (with C.I. Vasile, I. Dumitrache, Gh. Păun) On the Power of Enzymatic Numerical P Systems, *Acta Informatica*, 49, 6 (2012), 395–412.

10. (with C. Buiu) Using Enzymatic Numerical P Systems for Modeling Mobile Robot Controller, *Natural Computing*, 11, 3 (2012), 387–393.

Personal web page: https://anabrandusa.wordpress.com/

PĂTRAŞCU, Mihai

Born on July 17, 1982, in Craiova, Romania, passed away on June 5, 2012, in USA.

Education: High school in Craiova (multiples medals at international mathematics, computer science, and physics olympiads). After two years of undergraduate studies in Craiova (2001–2002), he left for USA where he completed undergraduate (2002–2006) and gradute (2006–2007) studies in computer science at Massachusetts Institute of Technology. Master thesis: *Computational Geometry Through the Information Lens*, 2007. Scientific adviser: Erik Demaine.

PhD: MIT, 2008. Thesis title: *Lower Bound Techniques for Data Structures.* Scientific advisor: Erik Demaine:

Scholarships, postdoc stages: Raviv postdoctoral fellow at IBM Almaden, 2009.

Positions: AT&T Labs, din Florham Park, New Jersey, USA.

Research areas: Data structures, data bases, computational complexity.

Main results:

Mihai's main research area was data structure lower bounds. In data structures we try to understand how we can efficiently represent, access, and update information. Mihai revolutionized and revitalized the lower bound side, in many cases matching known upper bounds. The lower bounds were proved in the powerful cell-probe model that only charges for memory access, hence which captures both RAM and external memory. Already in 2004, as a second year undergraduate student, with his supervisor Erik Demaine as non-alphabetic second author, he broke the $\Omega(\log n/\log\log n)$ lower bound barrier that had impeded dynamic lower bounds since 1989, and showed the long awaited first logarithmic lower bound by an elegant short proof, a true combinatorial gem. The important conclusion was that binary search trees are optimal algorithms for the textbook problem of maintaining prefix sums in a dynamic array. They also proved an $\Omega(\log n)$ lower bound for dynamic trees, matching Sleator and Tarjan's upper bound from 1983. (...)

With his amazing energy and creative spirit, Mihai continued his work with many different collaborators on diverse topics. Data structure lower bounds,

however, remained his core research area. In one of his favourite papers [M. Pătraşcu, Unifying the landscape of cell-probe lower bounds. *SIAM Journal on Computing*, 40, 3 (2011), 827–847], he identified a whole new level of structure and connectivity in the field.

(From Mikkel Thorup, Mihai Pătraşcu: *Obituary and Open Problems*, https://docs.google.com/file/d/0B8ttd1KbGd3EWktsR29qNVdNVEE/edit)

Membership to professional organizations: International Scientific Committee for the International Olympiad of Informatics, since 2010.

Honors, prizes:

The Outstanding Undergraduate Award for best undergraduate research in the US and Canada, from the Computing Research Association (CRA), in 2005.

The Machtey Award for the best student paper at the Symposium on Foundations of Computer Science in 2008.

The Presburger Award from the European Association for Theoretical Computer Science in 2012, for breaking "many old barriers on fundamental data structure problems, not only revitalizing but also revolutionizing a field that was almost silent for over a decade".

Representative articles:

1. (with E. Demaine) Logarithmic Lower Bounds in the Cell-Probe Model. *SIAM Journal on Computing*, 35, 4 (2006), 932–963.
2. (with M. Thorup) Time-Space Trade-Offs for Predecessor Search, *Proc. 38th ACM Symposium on Theory of Computing* (*STOC*), 2006, 232–240.
3. (with E. Demaine, D. Harmon, J. Iacono) Dynamic Optimality-Almost. *SIAM Journal on Computing*, 37, 1 (2007), 240–251.
4. Lower Bounds for 2-Dimensional Range Counting, *Proc. 39th ACM Symposium on Theory of Computing* (*STOC*), 2007, 40–46.
5. Succincter, *Proc. 49th IEEE Symposium on Foundations of Computer Science* (*FOCS*), 2008, 305–313.
6. (with T.M. Chan) Transdichotomous Results in Computational Geometry, I: Point Location in Sublogarithmic Time, *SIAM Journal on Computing*, 39, 2 (2010) 703–729.
7. (with Y. Dodis, M. Thorup) Changing Base Without Losing Space, *Proc. 42nd ACM Symposium on Theory of Computing* (*STOC*), 2010, 593–602.
8. Towards Polynomial Lower Bounds for Dynamic Problems, *Proc. 42nd ACM Symposium on Theory of Computing* (*STOC*), 2010, 603–610.
9. (with M. Thorup) Higher Lower Bounds for Near-Neighbor and Further Rich Problems, *SIAM Journal on Computing* 39, 2 (2010), 730–741.
10. (with E. Viola) Cell-Probe Lower Bounds for Succinct Partial Sums, *Proc. 21st ACM/SIAM Symposium on Discrete Algorithms* (*SODA*), 2010.

11. (with T.M. Chan, L. Roditty) Dynamic Connectivity: Connecting to Networks and Geometry, *SIAM Journal on Computing*, 40, 2 (2011), 333–349.

12. Unifying the Landscape of Cell-Probe Lower Bounds, *SIAM Journal on Computing,* 40, 3 (2011), 827–847.

13. (with L. Roditty, M. Thorup) A New Infinity of Distance Oracles for Sparse Graphs, *Proc. 53nd IEEE Symposium on Foundations of Computer Science* (*FOCS*), 2012, 738–747.

14. (with M. Thorup) The Power of Simple Tabulation-Based Hashing, *Journal of the ACM*, 59, 3 (2012).

Further information:

WebDiarios de Motocicleta: http://infoweekly.blogspot.co.nz

Mihai Pătraşcu Google Scholar papers and citations 2004–2015: https://scholar.google.com/citations?user=-3VoT8cAAAAJ.

Mihai Pătraşcu memorial: http://mipmemorial.blogspot.co.nz.

Wikipedia page: https://en.wikipedia.org/wiki/Mihai_Pătraşcu.

Personal web page: http://people.csail.mit.edu/mip/

(Pages written with the contribution of Cristian Calude.)

PĂUN, Paul Andrei

Born on August 4, 1975, in Curtea de Argeş, Romania.

Education:
BSc in mathematics and computer science, University of Bucharest (2004–2008).
Master in computer science, University of Western Ontario, London, Canada (2008–2009).

PhD: University of Western Ontario, London, Canada, 2003. Thesis title: *Unconventional Models of Computation: DNA and Membrane Computing*. Scientific advisor: Sheng Yu.

Scholarships, postdoc stages: University of Western Ontario, 1998–2003, NSERC Post Doctoral Fellowship 2003, Polytechnical University of Madrid, 2006, 2007.

Positions: Assistant Professor (2003–2008), Associate Professor with tenure (2008–2010) at Louisiana Tech University, USA (on leave of absence 2009, 2010); Junior Researcher (2007–2009), Senior Researcher (2009 – present) at National Institute of R&D for Biological Sciences, Bucharest, Romania; Associate Professor (2009–2013), Professor (2013 – present) Faculty of Mathematics and Computer Science, University of Bucharest.

Research areas: Biocomputing, automata theory, systems biology, bio-informatics.

Main results: Introduced symport-antiport P systems and max-sequentiality in SNP systems, minimization algorithm for cover automata, improvement in segmentation of Affymetrix DNA chips images, discrete nondeterministic simulation method based on a memory model for signal pathways.

Administrative positions: Louisiana Tech University senate member, 2004–2008, University of Bucharest senate member, 2015–2019; University of Bucharest head of Exact Science pillar of Research Institute of the University of Bucharest, since 2014.

Membership to professional organizations: ACM lifetime member, IEEE Computer Society, EATCS.

Honors, prizes, scientific distinctions:

– "Grigore C. Moisil" Prize of the Romanian Academy, 2015.

– Awarded in 2011 the title of "Bologna Professor" from the associations of Romanian students (ANOSR) after being nominated by my students from University of Bucharest. More information at http://www.profitari.ro/.

– The paper "The Power of Communication: P Systems with Symport/ Antiport" was selected in 2002 by Thomson ISI Essential Science Indicators as one of the most influential/cited papers and ranks in the top 1% in the field.

– Best paper award at Conference on Membrane Computing 2018.

PhD students: Bianca Popa (2006), John Jack (2009), Shenghua Ni (2010), Mircea Digulescu (in progress), Daniela Cheptea (in progress), Cristian Tudor (in progress), Florin Bîlbîe (in progress), Ionuț Gavrilă (in progress).

Books:

1. (with S. Yu, eds.) *Implementation and Application of Automata, Lecture Notes in Computer Science*, 2088, Springer, Berlin, 2001.

2. (with O.H. Ibarra) *Membrane Systems: A "Natural" Way of Computing with Cells*, book chapter (chapter 3, 26 pages), in S. Rajasekaran, J. Reif, eds., *Handbook of Parallel Computing: Models, Algorithms and Applications* (Chapman & Hall/Crc Computer & Information Science Series), 2007.

3. *Computability of the DNA and Cells: Splicing and Membrane Computing*, SBEB Publishing, 2008 (378 pages).

4. (with M. Păun) *Analiză Statistică Folosind Limbajul R*, Matrix Publ. House, Bucureşti, 2009 (189 pages).

Representative articles:

1. (with C. Chandler, C. Leangsuksun, M. Păun) A Failure Index for HPC Applications, *J. Parallel Distrib. Comput.*, 93–94 (2016), 146–153.

2. (with X. Zhang, L. Pan) On the Universality of Axon P Systems, *IEEE Transactions on Neural Networks and Learning Systems*, 26, 11 (2015), 2816–2829.

3. (with M. Păun, Y. Li, Y. Cheng, I. Tusa) Segmenting Microarray Images Using a Contour-Based Method, *Theoretical Computer Science*, 68, 1 (2015), 108–118.

4. (with O.H. Ibarra, A. Rodriguez-Patón) Sequential SNP Systems Based on min/max Spike Number, *Theoretical Computer Science*, 410, 30–32 (2009), 2982–2991.

5. (with M. Păun, A. Rodriguez-Patón) On the Hopcroft's Minimization Technique for DFA and DFCA, *Theoretical Computer Science*, 410, 24–25 (2009), 2424–2430.

6. (with Gh. Păun) Small Universal Spiking Neural P Systems, *BioSystems*, 90, 1 (2007), 48–60.

7. (with C. Câmpeanu, J.R. Smith) Incremental Construction of Minimal Deterministic Finite Cover Automata, *Theoretical Computer Science*, 363, 2 (2006), 135–148.

8. (with Gh. Păun) The Power of Communication: P Systems with Symport/ Antiport, *New Generation Computing*, 20, 3 (2002), 295–305.

9. (with C. Câmpeanu, S. Yu) An Efficient Algorithm for Constructing Minimal Cover Automata for Finite Languages, *International Journal of Foundations of Computer Science*, 13, 1 (2002), 83–97.

10. Controlled H Systems of a Small Radius, *Fundamenta Informaticae*, 31, 2 (1997), 185–193.

Further information:

– Reviewer of the Romanian Agency for Quality Assurance in Higher Education (ARACIS) Agency – member of the National Register of ARACIS reviewers for Computer Science, since 2015.

– Certified specialist in the management of public institutions, Bucharest University of Economic Studies, Faculty of Management, Bucharest, Romania, 2015.

– Member of the CNATDCU Computer Science section (one of 7 – now 9 – members nominated in September 2012) representing INCDSB, since 2012.

– Expert of the Executive Agency for Higher Education, Research, Development and Innovation Funding for PNII projects, 2012–2015.

– H-Index = 12 in ISI, H-index = 20 in Google Scholar, more than 465 citations in ISI, more than 1500 citations in Google scholar, more than 60 ISI papers, 8 books or book chapters in international publishing houses. All publications are since 1997.

Personal web page: http://www.unibuc.ro/~apaun

PĂUN, Gheorghe

Born on December 6, 1950, in Cicăneşti village, Argeş county, Romania.

Education: Faculty of Mathematics, Bucharest University (1969–1974), with specialization in computer science in the fifth year (1973–1974).

PhD: University of Bucharest, Faculty of Mathematics, 1977. Thesis title: *Simulation of Some Economic Processes by Means of Formal Language Theory*. Scientific advisor: Solomon Marcus.

Scholarships, postdoc stages: "Alexander von Humboldt" scholarship (Magdeburg, Germany, 1992–1993), repeated research scholarships in Turku, Finland (1994–1999), Ramon y Cajal scholarship (Tarragona, Spain, 2001–2003, and Sevilla, Spain, 2003–2006), repeated scholarships in France, The Netherlands, Japan, Canada, Hungary, Poland, China, Spain. Numerous research visits in many other countries.

Positions: Mathematician at CEPECA computer center (1974–1978), Researcher at Division of Systems Studies of Bucharest University (1978–1987) and then at the Computer Center of Bucharest University (1987–1990), Researcher and then Senior Researcher at the "Simion Stoilow" Institute of Mathematics of the Romanian Academy, Bucharest (from 1990 to December 2015, when I retired).

Research areas: Automata and formal language theory (descriptional complexity, grammars with restrictions in derivation, Marcus contextual grammars, grammar systems), combinatorics on words, applications of formal languages in modelling economic processes and in semiotics; from 1994 almost totally devoted to DNA and membrane computing.

Main results:

– Systematic study of grammars with regulated rewriting, new classes of regulated grammars introduced (e.g., valence grammars).

– Systematic study of Marcus contextual grammars, (co)author of several new classes of such grammars, author of the two monographs in this area.

– Contributions to the study of infinite sequences of symbols, new types of (self-reading) sequences. Introduced, with Arto Salomaa, the *thin* and the *slender* languages.

– Co-initiator of grammar systems area, systematic study of cooperative distributed and of communicating parallel grammar systems.

– Basic results concerning (theoretical) DNA computing based on splicing, many classes of splicing systems (called H systems) introduced, mainly in collaboration with G. Rozenberg, A. Salomaa, L. Kari and others.

– Initiator, in 1998, of membrane computing, a vivid branch of natural computing, which abstracts computing models (called P systems) inspired form the architecture and the functioning of the biological cell. There were published more than 2500 papers in this area, more than 100 PhD theses, more than 10 monographs, more than 50 collective volumes and special issues of journals, containing theoretical results and applications. There are three yearly specialized meetings, two in Europe and one in Asia, an International Membrane Computing Society, and from 2018 Springer-Verlag publishes a dedicated *Journal of Membrane Computing*.

Editorial boards: member, for various periods, of more than 25 international journals; here are some of them, most of them having an ISI impact factor: *Journal of Universal Computer Science* (Springer); *Journal of Computing and Informatics,* former *Computers and Artificial Intelligence* (Slovak Academy, Bratislava); *Acta Cybernetica* (Szeged University, Hungary); *Journal of Automata, Languages, and Combinatorics* (Magdeburg/Giessen University, Germany); *Fundamenta Informaticae* (IOS Press); *Romanian Journal of Information Science and Technology* (Romanian Academy – executive editor from 1998 to 2003); *Computer Science Journal of Moldova* (Moldavian Academny of Sciences, Chişinău); *International Journal of Foundations of Computer Science* (World Scientific); *International Journal of Computer Mathematics* (Gordon and Breach – associate editor 2002–2005); *Natural Computing. An International Journal* (Springer); *Soft Computing* (Springer, area editor, DNA and membrane computing); *BioSystems* (Elsevier); *Theoretical Computer Science. Natural Computing Series* (Elsevier); *International Journal of Unconventional Computing; New Generation Computing* (Springer şi Omsha–Japonia); *Progress in Natural Science* (Elsevier and Science in China Press); *Economic Computation and Economic Cybernetics Studies and Research* (ASE Bucureşti); *International Journal of Computers, Communication, and Control* ("Agora" University, Oradea).

Membership to professional organizations: for various periods, member of the Romanian Mathematical Society, American Mathematical Society, European Association for Theoretical Computer Science; since 2016, co-founder and honorary president of the International Membrane Computing Society.

Honors, prizes, scientific distinctions:

– Member of the Romanian Academy (1997 – corresponding, 2012 – titular), of Academia Europaea (2006), of International Academy of Mathematical Chemistry (2010).

– Doctor honoris causa of Silesian University at Opava, Czech Republic

(2008), Piteşti University, Romania (2010), "Agora" University of Oradea, Romania (2015), Iaşi "Apollonia" University, Romania (2016), West University of Timişoara, Romania (2016).

– National "Star of Romania" Medal (2016 – the highest decoration in Romania).

– Honorary citizen of Curtea de Argeş town (1999), Argeş county (2007), Cicăneşti village (2009).

– Many other prizes, diplomas, titles (e.g., honorary professor of universities in China), anniversary volumes.

PhD students: Victor Mitrana (1993), Gianina Georgescu (1995), Sorina Vicolov (1997), Dragoş Sburlan (2006). Many young Romanians started the research activity with me and completed the PhD theses abroad; among them: Lila Kari, Lucian Ilie, Armand-Mihai Ionescu.

Books:

1. (with J. Dassow) *Regulated Rewriting in Formal Language Theory,* Akademie-Verlag, Berlin, 1989, Springer, Berlin, Heidelberg, 1989.
2. (with E. Csuhaj-Varjú, J. Dassow, J. Kelemen) *Grammar Systems. A Grammatical Approach to Distribution and Cooperation,* Gordon and Breach, London, 1994.
3. *Marcus Contextual Grammars,* Kluwer, Boston, Dordrecht, London, 1997.
4. (with G. Rozenberg, A. Salomaa) *DNA Computing. New Computing Paradigms*, Springer, Heidelberg, 1998, Springer, Tokyo, 1999 (Japanese translation), Mir, Moscow, 2004 (Russian translation), Tsinghua Univ. Press, Beijing, 2004 (Chinese translation).
5. *Membrane Computing. An Introduction*, Springer, Berlin, 2002 (Chinese translation – 2012).
6. (with G. Rozenberg, A. Salomaa, eds.) *The Oxford Handbook of Membrane Computing*, Oxford Univ. Press, 2010 (xviii + 672 pages).

Representative articles:

1. On the Splicing Operation, *Discrete Appl. Math*., 70 (1996), 57–79.
2. Regular Extended H Systems Are Computationally Universal, *Journal of Automata, Languages and Combinatorics*, 1, 1 (1996), 27–36.
3. (with L. Kari, G. Rozenberg, A. Salomaa, S. Yu) DNA Computing, Sticker Systems, and Universality, *Acta Informatica*, 35, 5 (1998), 401–420.
4. (DNA) Computing by Carving, *Soft Computing*, 3, 1 (1999), 30–36
5. (with R. Freund, L. Kari) DNA Computing Based on Splicing: The Existence of Universal Computers, *Theory of Computing Systems*, 32 (1999), 69–112.
6. Computing with Membranes, *Journal of Computer and System Sciences*, 61, 1 (2000), 108–143.

7. P Systems with Active Membranes: Attacking **NP**-Complete Problems, *Journal of Automata, Languages and Combinatorics*, 6, 1 (2001), 75–90.

8. (with A. Păun) The Power of Communication: P Systems with Symport/ Antiport, *New Generation Computing*, 20, 3 (2002), 295–306.

9. (with M. Ionescu, T. Yokomori) Spiking Neural P Systems, *Fundamenta Informaticae*, 71, 2–3 (2006), 279–308.

10. (with R. Păun) Membrane Computing and Economics: Numerical P Systems, *Fundamenta Informaticae*, 73, 1–2 (2006), 213–227.

Further information:

– In 2003, ISI nominated GhP as *highly cited researcher* in computer science.

– A wide extramathematical activity, e.g., many fiction books (member of the Romanian Writers Union), popularization and logical games books, propagator of the game of GO in Romania (the first president of the Romanian GO Federation); in 2010 he initiated the culture monthly journal *Curtea de la Argeş* (www. curteadelaarges.ro), whose editor-in-chief he is.

PÂRV, Bazil

Born on September 27, 1953, in Petreştii de Jos, Cluj county, Romania.

Education:

Undergraduate studies (1972–1976), computer science, Faculty of Mathematics and Mechanics, "Babeş-Bolyai" University Cluj-Napoca.

Master degree (1976–1977), Faculty of Mathematics and Mechanics, "Babeş-Bolyai" University Cluj-Napoca.

PhD in mathematics at "Babeş-Bolyai" University Cluj-Napoca, Faculty of Mathematics, 1990. Thesis title: *Averaging Method with Applications to Celestial Mechanics*. Scientific advisor: Pál Árpád.

Scholarships, postdoc/research visits:

October 2008: research visit, ETH Zurich, Switzerland.

September – December 2005: visiting professor, Department of Computer Science, Wayne State University, Detroit, Michigan, USA.

June – August 1999: internship, People Technology Foundation, Summit, New Jersey, USA.

March – June 1996: internship, People Technology Foundation, Summit, New Jersey, USA.

February 1994: research visit, Russian Academy of Sciences, Supercomputer Institute, Moscow, Russia.

November 1990: research visit, Vrije Universiteit Brussel, Belgium.

Positions:

Professor (since March 1998), Chair of Programming Languages and Methods/ Department of Computer Science, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University Cluj-Napoca.

Associate Professor (October 2009 – February 2011) "Petru Maior" University Târgu-Mureş, Romania.

Associate Professor (October 2009 – February 2010) "Al.I. Cuza" University Iaşi, Romania.

Associate Professor (October 1999 – February 2002) "1 December" University Alba Iulia, Romania.

Associate Professor (March 1993 – March 1998) Chair of Programming Languages and Methods, Department of Computer Science, Faculty of Mathematics and Computer Science, "Babeş–Bolyai" University Cluj-Napoca.

Lecturer (October 1990 – March 1993) Chair of Computer Science, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University Cluj-Napoca.

Programmer (August 1979 – October 1990) Computing Center, "Babeş-Bolyai" University, Cluj-Napoca.

Programmer (September 1977 – August 1979) Computing Center, "Jiu Valley" Mining Combinate, Petroşani, Hunedoara County, Romania.

Research areas:

Computer science: software engineering, programming languages, object-oriented programming, component-based programming, computer algebra, evolutionary computation, computer science education.

Astronomy: celestial mechanics and space dynamics, dynamical systems, artificial satellites.

Mathematical modeling and applications to mathematical chemistry, civil engineering, agricultural research, economic sciences.

Main results:

Computer science/software engineering: (evolutionary computation) the design of new nature-inspired evolutionary algorithms, (model-driven engineering) the design and implementation of a platform-independent and executable component modeling language, (real-time system verification) the use of separation logic in the verification of communication protocols used in railway systems, (computer science education) a proposal for introducing computational thinking in junior-high education – an Israel initiative, (computer algebra) the design and implementation of a Poisson Symbolic Processor (PSP) able to perform analytic operations on Poisson sums.

Astronomy/celestial mechanics: the development of new motion theories of Artificial Earth Satellites (AES) using averaging method and PSP, the computation of the solution of *n*-body problem using Lie series, the design and implementation of programs for computing the ephemeris of an AES and for improving orbital elements of AWS using visual optical observations.

Mathematical modeling and applications: (mathematical chemistry) the development of new algorithms for computing topological indices and for the design of some new nanostructures, (statistics) the design and implementation of computer programs for analysis of variance and multiple linear regression, (economic sciences) the modeling of decision problems as games with incomplete information, (civil engineering) the application of new numerical integration methods to study the dynamic behavior of cable structures.

Administrative positions:

2016–2017, director, Doctoral School of Mathematics and Informatics, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University Cluj-Napoca.

2012–2016, vice-president, Computer Science Committee, CNATDCU, Ministry of Education, Bucharest.

2012–1016, director, Department of Computer Science, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University Cluj-Napoca.

2008–1012, head, Chair of Programming Languages and Methods/ Department of Computer Science, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University Cluj-Napoca.

1993–1998, director, Computing Center, "Babeş-Bolyai" University Cluj-Napoca.

Editorial boards: *Studia Informatica* ("Babeş-Bolyai" Univ., Cluj-Napoca), *Acta Universitatis Apulensis* ("1 Decembrie 1918" Univ., Alba Iulia).

Membership to professional organizations: European Society of Mathematical Chemistry, since 2007; IEEE (Institute of Electrical and Electronic Engineers), since 2007; ACM (Association for Computing Machinery), professional member, since 2005; IAU (International Astronomical Union), since 1988; Romanian Mathematical Society, since 1987.

PhD students: Ramona-Carmen Stoica (2017), Călin Eugen Nicolae Gal-Chiş (2017), Tibor Kiss (2017), Delia Merca-Roman (married Tuşe; 2016), Hossam Mohammed Zawbaa Ismail ElSayed (2016), Virginia-Ramona Hatfaludi (Bucilă) (2013; co-supervised with Mircea V. Diudea, chemistry); Horaţiu Stan Paul (2012), Arthur Jozsef Molnar (2012), István-Gergely Czibula (2009).

Books:

1. (with S. Motogna, I. Lazăr) *Developing Executable UML Components Based on fUML and ALF*, chapter 14 in V.G. Díaz, J.M. Cueva Lovelle, B.C. Pelayo García-Bustelo, eds., *Handbook of Research on Innovations in Systems and Software Engineering* (2 Volumes), IGI–Global International, 2015, 345–364.
2. (with S. Motogna, I. Lazăr) *An MDA Approach for Developing Executable UML Components*, chapter 12 in E. Asnina, J. Osis, eds., *Model–Driven Domain Analysis and Software Development: Architectures and Functions*, IGI–Global International, 2011, 254–273.
3. *Rapid Application Development with Visual Basic* (Romanian), Gil Publishing House, Zalău, 2003 (552 pages).
4. (with A.I. Vancea) *Fundamentals of Programming Languages* (Romanian), Microinformatica Publishing House, Cluj-Napoca, 1996 (321 pages).
5. (with M. Frenţiu) *Program Development. Modern Methods and Techniques* (in Romanian), ProMedia Publishing House, Cluj-Napoca, 1994 (220 pages).

Representative articles:

1. (with E. Emary, H.M. Zawbaa, A.E. Hassanien) Multi-Objective Retinal Vessel Localization Using Flower Pollination Search Algorithm with Pattern Search, *Advances in Data Analysis and Classification*, 11, 3 (2017), 611–627.

2. (with T. Kiss, F. Crăciun) Verification of Protocol Specifications with Separation Logic, *Proc. ICCP 2015, IEEE 11th International Conference on Intelligent Computer Communication and Processing,* Cluj-Napoca, September 3–5, 2015, 109–116.

3. (with H.M. Zawbaa, E.E. Emary, A.E. Hassanien) A Wrapper Approach for Feature Selection Based on Swarm Optimization Algorithm Inspired in the Behavior of the Social-Spider, *Proc. SoCPaR 2015, 7th IEEE International Conference on Soft Computing and Pattern Recognition*, Fukuoka, Japan, November 13–15, 2015.

4. (with I. Zur Bargury, D. Lanzberg) A Nationwide Exam as a Tool for Improving a New Curriculum, *ITICSE 2013 ACM Conference on Innovation and Technology in Computer Science Education*, July 1–3, 2013, University of Kent, Canterbury, England, 267–272.

5. (with I. Parpucea, T. Socaciu) Modeling Uncertainty in a Decision Problem by Externalizing Information, *Int. J. of Computers, Communications & Control*, 5, 6 (2011), 328–336.

6. (with I. Lazăr, S. Motogna) Behaviour-Driven Development of Foundational UML Components, *Electronic Notes in Theoretical Computer Science*, 261, 1 (2010), 91–105.

7. (with I. Lazăr, S. Motogna) ComDeValCo Framework – The Modeling Language for Procedural Paradigm, *Int. J. of Computers, Communications & Control*, 3, 2 (2008), 2, 183–195.

8. (with S. Motogna, I. Lazăr, I.G. Czibula, C.L. Lazăr) ComDeValCo – A Framework for Software Component Definition, Validation, and Composition, *Studia Univ. "Babeş-Bolyai", Informatica*, 52, 2 (2007), 59–68.

9. (with M.V. Diudea, M. Ştefu, P.E. John) Wiener Index of Armchair Polyhex Nanotubes, *Croat. Chem. Acta,* 77, 1–2 (2004), 111–115.

10. Lie Series and Computer Algebra Treatment of the *n*-Body Problem, *Roum. Astr. J.*, 3, 2 (1993), 157–164.

11. Poisson Symbolic Processor, *Studia Univ. "Babeş-Bolyai", Mathematica*, 34, 3 (1989), 17–29.

Personal web page: http://www.cs.ubbcluj.ro/~bparv/

PETCU, Dana

Born on May 12, 1966, in Timişoara, Romania.

Education: 1984–1988, undergraduate studies in computer science, at Timişoara University.

PhD in numerical analysis, University of Timişoara, 1994. Thesis title: *Numerical Solution of Stiff Differential Equations.* Scientific advisor: Ştefan Măruşter.

Scholarships, postdoc stages: Tempus grant for PhD studies at IWR – University Karl-Ruprecht, Heidelberg, Germany, 1992–1993.

Positions: Analyst, Computer Office, I.U.R.T. Lugoj (1988–1990); Analyst, Computer Office, Bega-Pam Timişoara (1990–1991); Assistant Professor (1991–1994), Lecturer (1994–1997), Associate Professor (1997–2002), Professor (2003 – present), Faculty of Mathematics and Computer Science, West University of Timişoara.

Research areas: Distributed and parallel computing, numerical analysis.

Main results: Highly cited researcher for the contributions in the fields of cloud, grid, and parallel computing.

Administrative positions: Director of Institute e-Austria Timişoara (2002 – present); Director of Computer Science Department, West University of Timişoara (2008–2011); Vice-rector, West University of Timişoara (2016 – present).

Editorial boards: *Scalable Computing: Practice and Experience* (editor-in-chief, 2009 – present).

Membership to professional organizations: IEEE Society Affiliate; Member OW2 – open source community, Domain Expert for Romanian Delegations at European forums (FP7–ICT Committee, 2007–2013; Committee for CIP, 2007–2008; COST program – ICT Domain, 2007–2008; e-IRG, 2008–2015; e-Infrastructure Policy Forum, 2011–2013; Observer in PRACE Council, 2014 – present).

Honors, prizes, scientific distinctions: Maria Sibylla Merian-Award 2005 and IBM Faculty Award 2009; MLNR Award "Spiru Haret" 2015 and "Gheorghe Cartianu" Award of the Romanian Academy, 2015; best paper at *Adaptive* 2009.

PhD students: Marc Frîncu (2011), Adrian Copie (2013), Marian Neagul (2015), Silviu Pănică (2016).

Books:

1. (with E. Di Nitto, P. Matthews, A. Solberg, eds.) *Model-Driven Development and Operation of Multi-Cloud Applications*, Springer, Berlin, 2017.
2. (with J.L. Vazquez-Poletti, eds) *European Research Activities in Cloud Computing*, Cambridge Scholars Publishing, 2012.
3. (with N. Abdennadher, eds.) *Advances in Grid and Pervasive Computing*, *LNCS* 5529, Springer, Berlin, 2009.

Representative articles:

1. (in collaboration) Portable Cloud Applications – From Theory to Practice, *Future Generation Computer Systems*, 29, 6 (2013), 1417–1430.
2. Consuming Resources and Services from Multiple Clouds, *Journal of Grid Computing*, 12, 2 (2014), 321–345.
3. (in collaboration) Experiences in Building a Grid-Based Platform to Serve Earth Observation Training Activities, *Computer Standards & Interfaces*, 34, 6 (2012), 493–508.
4. (in collaboration) Cloud Resource Orchestration within an Open-Source Component-Based Platform as a Service, *Concurrency and Computation: Practice and Experience*, 27, 9 (2015), 2443–2469.
5. Portability and Interoperability Between Clouds: Challenges and Case Study, *LNCS* 6994, Springer, 2011, 62–74.
6. (in collaboration) Architecturing a Sky Computing Platform, *LNCS* 6569, Springer, 2010, 1–13.
7. (in collaboration) Next Generation HPC Clouds: A View for Large-Scale Scientific and Data-Intensive Applications, *LNCS* 8806, Springer, 2014, 26–37.
8. (in collaboration) Experiences in Building an Event-Driven and Deployable Platform as a Service, *LNCS* 7651, Springer, 2012, 666–672.
9. Experiments with an ODE Solver on a Multiprocessor System, *Computers & Mathematics with Applications*, 42, 8–9 (2001), 1189–1199.
10. PVMaple: A Distributed Approach to Cooperative Work of Maple Processes, *LNCS* 1908, Springer, 2000, 216–224.

Further information: Worked in more than 60 research projects (a third of them being grants from European Commission), leading a quarter of them or being partner leader in half of them (involving a team of 5–10 young researchers).

Personal web page: http://web.info.uvt.ro/~petcu

PETRE, Ion

Born on June 22, 1974, Novaci, Gorj county, Romania.

Education:
1988–1992: "I.L. Caragiale" High school (mathematics-physics), Ploieşti, Romania.
1992–1997: Undergraduate studies in computer science, University of Bucharest, Romania.

PhD in mathematics, University of Turku, 2002. Thesis title: *Commutation Problems on Sets and Multisets of Words.* Scientific advisor: Juhani Karhumäki.

Positions:
2002–2005: Assistant Professor, Department of Information Technologies, Åbo Akademi University, Turku, Finland.
2005–2010: Research Fellow of the Academy of Finland.
2010–present: Professor of computer science, Åbo Akademi University.

Research areas: Computational systems biology, network algorithmics, nature-inspired computing, formal methods for biology.

Main results:
Our network controllability algorithmic results successfully linked cancer-specific survivability-essential genes with FDA-approved drugs. These results give novel predictions regarding combinations of drugs that may be effectively used for individual patients. They also give useful insights into overcoming drug-resistance in some types of cancers.

We built a rich formal framework for the study of computational gene assembly in ciliates. Gene assembly is the most sophisticated process of gene manipulations known in nature, the source for the evolutionary resilience of ciliates, and the inspiration for some highly successful human genomics techniques, such as those based on telomeres. To mention only one result: we demonstrated that, despite the high degree of nondeterminism/variability in the gene assembly process, all assembly strategies are convergent towards the same result, thus explaining the successful use of a highly complex step in the reproduction of ciliates.

We introduced the first elementary mathematical model able to reproduce the experimental results on the heat shock response of human cells. The heat shock

response is a prototype example of a basic regulatory mechanism in the cell. (Ion Petre, Andrzej Mizera, Claire Hyder, Annika Meinander, Andrey Mikhailov, Richard Morimoto, Lea Sistonen, John Eriksson, Ralph-Johan Back, A Simple Mass-Action Model for the Eukaryotic Heat Shock Response and Its Mathematical Validation, *Journal of Natural Computing*, 10, 1 (2011), 595–612.)

We introduced the first elementary mathematical model that successfully predicted the assembly speed and the length of fully assembled intermediate filaments in human cells. Intermediate filaments are some of the basic structures in the human cells.

Administrative positions:

2016–2020: Co-director of the "Computational and Molecular Methologies for Life Sciences" research program of BioCity Turku, a multi-disciplinary community of 15 research groups, with 50 PhD students and 30 postdocs.

2017–2019: Member of the board of the Doctoral School in Computer Science at University of Bucharest, Romania.

2015 – present: Director of Turku Centre for Computer Science.

2015–2017: Member of the board of the Finnish Society for Computer Science.

2011–2014: Vice-director of Turku Centre for Computer Science.

2010 – present: Head of the Computer Science programs at Department of IT, Åbo Akademi University, Finland.

2005 – present: Leader of the Computational Biomodelling Laboratory, Turku Centre for Computer Science.

Editorial boards: *Frontiers in Bioinformatics and Computational Biology* (since 2011); *Theoretical Computer Science. Track C* on "Natural Computing" (Elsevier, since 2010); *Journal of Natural Computing* (Springer, since 2009); *International Journal on Nanotechnology and Molecular Computation* (IGI Global, since 2008); *Fundamenta Informaticae* (IOS Press, 2007–2009).

Membership to professional organizations: Finland's Swedish Academy for Technical Sciences, Association for Computing Machinery (ACM), European Association for Theoretical Computer Science (EATCS), Finnish Society for Computer Science.

Honors, prizes, scientific distinctions:

2016: Best paper award at the 14th International Conference on Computational Methods in Systems Biology, Cambridge, UK.

2011: Best paper award at the 9th International Conference on Computational Methods in Systems Biology, Paris, France.

2009: My research project Computational Processes in Living Cells was nominated as 1 of only 6 outstanding projects (of the 16 funded projects) in the

final evaluation report of Academy of Finland's systems biology and bioinformatics research program (2004–2007)

2008: "Grigore C. Moisil" Prize of the Romanian Academy, for work published during 2006 on "Computational Nature of Gene Assembly in Ciliates"

2003, 2004, 2011: Voted "Teacher of the year" by the students in computer science and engineering, Åbo Akademi University.

PhD students: Charmi Panchal (to graduate 2018), Muhammad Sanwa (to graduate 2019), Krishna Kanhaiya (to graduate 2019), Victor Popescu (started 2017), Diana-Elena Gratie (2016), Sepinoud Azimi (2015), Bogdan Iancu (2015), Andrzej Mizera (2011), Vladimir Rogojin (2009), Chang Li (2008).

Books:

1. (with A. Ehrenfeucht, T. Harju, D.M. Prescott, G. Rozenberg) *Computational Processes in Living Cell: Gene Assembly in Ciliates*, Springer, Berlin, 2003.

2. (with J. Kari, F. Manea, eds.) *Unveiling Dynamics and Complexity, Proc. 13th Conference on Computability in Europe*, CiE 2017, *LNCS* 10307, Springer, Berlin, 2017.

3. (with S. Azimi, H.J. Hoogeboom, J. Kleijn, M. van der Nat, A. Salomaa, eds.) *A Magician in Science. Liber Amicorum Grzegorz Rozenberg*, Turku Centre for Computer Science, 2017.

4. (with M. Gheorghe, M.J. Pérez-Jiménez, G. Rozenberg, A. Salomaa, eds.) *Multidisciplinary Creativity*, Spandugino, Bucharest, 2015.

5. (with C. Calude, J. Kari, G. Rozenberg, eds.) *Proc. 10th International Conference on Unconventional Computation*, *LNCS* 6735, Springer, Berlin, 2011.

Representative articles:

1. (with K. Kanhaiya, E. Czeizler, C. Gratie) Controlling Directed Protein Interaction Networks in Cancer, *Scientific Reports*, 7, 1 (2017), 10327.

2. (with U. Sanwal, L. Petre) Stepwise Construction of a Metabolic Network in Event–B: The Heat Shock Response, *Computers in Biology and Medicine*, 91 (2017), 1–12.

3. (with S. Azimi, C. Gratie, S. Ivanov, L. Manzoni, A.E. Porreca) Complexity of Model Checking for Reaction Systems, *Theoretical Computer Science*, 623 (2016), 103–113.

4. (with E. Czeizler, V. Rogojin) The Phosphorylation of the Heat Shock Factor as a Modulator for the Heat Shock Response, *IEEE/ACM Transactions on Computational Biology and Bioinformatics* 9, 5 (2012), 1326–1337.

5. (with E. Czeizler, A. Mizera, E. Czeizler, R.-J. Back, J.E. Eriksson) Quantitative Analysis of the Self-Assembly Strategies of Intermediate Filaments from Tetrameric Vimentin, *IEEE/ACM Transaction on Computational Biology and Bioinformatics*, 9, 3 (2012), 885–893.

6. (with A. Salomaa) Algebraic Systems and Pushdown Automata, *Handbook of Weighted Automata*, 2009

7. (with A. Ehrenfeucht, T. Harju, D.M. Prescott, G. Rozenberg) Formal Systems for Gene Assembly in Ciliates, *Theoretical Computer Science*, 292 (2003), 199–219.

8. (with A. Ehrenfeucht, D.M. Prescott, G. Rozenberg) String and Graph Reduction Systems for Gene Assembly in Ciliates, *Mathematical Structures in Computer Science*, 12 (2002), 113–134.

9. (with A. Ehrenfeucht, T. Harju, G. Rozenberg) Characterizing the Micronuclear Gene Patterns in Ciliates, *Theory of Computing Systems*, 35 (2002), 501–519.

10. (with J. Karhumäki) Conway's Problem for Three Word Sets, *Theoretical Computer Science*, 289, 1 (2002), 705–725,.

Personal web page: http://users.abo.fi/ipetre/

POP, Horia Florin

Born on April 20, 1968, in Cluj-Napoca, Romania.

Education:

BSc studies in computer science, "Babeş-Bolyai" University, Cluj-Napoca, 1987–1991. Licentiate thesis: *Adaptive Prototypes in Fuzzy Clustering.* Supervisor: D. Dumitrescu

PhD in computer science, "Babeş-Bolyai" University, Cluj-Napoca, 1992–1995. Thesis title: *Intelligent Systems in Classification Problems.* Scientific advisor: Militon Frenţiu

Positions:

Teaching Assistant (1991–1994), Assistant Professor (1994–1996), Lecturer (1996–1998), Associate Professor (1998–2004), Professor (2004 – present), Department of Computer Science, "Babeş-Bolyai" University, Cluj-Napoca, Romania.

Analyst, Computer Center, History Museum of Transylvania, Cluj-Napoca, Romania, 1991–1991.

Scholarships, research visits, visiting professor (selection):

July 8–16, 2017: Research visit, Kyung Hee University, Seoul, Korea.

July 6–17, 2015: Research visit, Tongji University, Shanghai, China.

June 19–26, 2013: Research visit, Dicle University, Diyarbakir, Turkey.

These visits were done in the framework of the research program "System for management and intelligent analysis of medical data in order to improve response strategies for acute and chronic diseases", financed by UEFISCDI–CNDI.

June 17–July 15, 2008: Research visit, University of Liverpool and University of Edinburgh, United Kingdom, in the framework of the research program "Robust Methods and Models of Data Processing with Applications in Natural Sciences", financed by CNCSIS.

January 1 – May 16, 2006: Visiting professor at the Department of Computer Science, Wayne State University, United States, in the framework of the mutual Academic Exchange Agreement.

June 15 – August 15, 2002 and July 1 – August 31, 2001: Research visits, Faculty of Chemistry, University of Memphis, United States, in the framework of the common research program "US-Romanian Research on Soft Computing Approaches to Modeling Metal Chemistry for Catalysis Applications".

October 1, 1999 – April 30, 2001: Member of the project DAWAI – research project on the time-adaptive processing of natural language, supported through a DFG grant developed at the Natural Languages Division, Department of Computer Science, University of Hamburg.

April 20 – July 15, 1998: Didactic visit at the University of Liverpool in the framework of the Tempus sJep Project 11219/1996 "Support for Chemistry College by Computer Aided Learning", with the task to develop a didactic demonstrative software package for applications in analytical chemistry.

September 1, 1996 – April 1, 1997: Study visit at the Lawrence Orlando Berkeley National Laboratory and different other universities in California, United States.

December 1, 1995 – March 1, 1996: Study visit at the Universitat Politecnica de Catalunya, Barcelona, and the Universidad de Malaga, in Spain.

March 17 – April 15, 1994: Study visit at the University of Liverpool, under a ROMLISS program financed by the British Council and the Soros Foundation for an Open Society.

October 9, 1992 – January 31, 1993: Scholarship in the field of Sun computer networks, at the Université de Genève in Switzerland, as a result of the cooperation relationships between the two universities.

Research areas:

Scientific data analysis – soft computing, fuzzy logic and related issues, computational intelligence, artificial intelligence.

Programming methodologies – functional and logic programming (Lisp & Prolog), Windows applications programming, internet programming.

Main results:

Methods based on fuzzy sets theory and fuzzy logic have been investigated. These methods proved very effective in the study of applications from domains such as natural sciences. Original research results include methods of fuzzy clustering and fuzzy cross-clustering, robust methods of estimation of central location (fuzzy mean) or of data dispersion (fuzzy standard deviation), fuzzy robust regression (fuzzy regression), principal components analysis and discriminant analysis based on the fuzzy sets theory (fuzzy principal component analysis, fuzzy discriminant analysis) with applications in multidimensional data modeling from natural sciences.

Administrative positions:

Vice-president, UBB Senate (since 2016); President, Senate Committee for Curriculum, UBB (2012–2016); Director, Division for Information Technology and Communication, UBB (since 2012); Vice-dean, Faculty of Mathematics and Computer Science, UBB (2004–2012).

Member of Computer Science Commissions of CNCS (since 2016), CNATDCU (since 2016), ARACIS (since 2005), CNCSIS, UEFISCDI (since 1998).

Editorial boards: *Studia UBB, Series Informatica* (editorial assistant since 1996, editor-in-chief since 2017), *International Journal of Sustainable Lighting* (Kyung Hee University, Republic of Korea, since 2015), *Scientific Bulletin of the "Petru Maior" University of Târgu-Mureş* (since 2011), *Ingineria Iluminatului – Journal of Lighting Engineering* (Technical University of Cluj-Napoca, Romania, 2001–2015).

Membership to professional organizations: American Mathematical Society (since 2007); Societatea de Ştiinţe Matematice din România (since 2006); Berkeley Initiative in Soft Computing (since 1997); Association of Computing Machinery (1995–1998).

Honours: "Spiru Haret" Prize for Education, Environment and IT, awarded by MLNR and the Romanian Academy, 2013.

PhD students: Annamaria Szenkovitz (2017), Alina Miron (2014), Attila Tibor Afra (2013), Ovidiu Şerban (2013), Botond Attila Bocsi (2013), Szidonia Lefkovitz (2012), Radu Dan Găceanu (2012), Hunor Sandor Jakab (2012), Páli Gábor János (2012).

Books:

1. (with P.A. Blaga) *LATEX 2e*, Editura Tehnică, Bucureşti, 1999 (364 pages).
2. (with O. Horowitz, C. Sârbu) *Clasificarea Raţională a Elementelor Chimice*, Editura Dacia, Cluj-Napoca, 200 (258 pages).
3. (with C. Sârbu) Fuzzy Soft-Computing Methods and Their Applications in Chemistry, chapter in *Reviews in Computational Chemistry*, K.B. Lipkowitz, R. Larter, T.R. Cundari, eds., vol. 20, VCH Publishers, New York, 2004, 249–332.
4. (with M. Frenţiu) *Fundamentals of Programming*, Cluj-Napoca University Press, 2006 (220 pages).
5. (with G. Czibula) *Elemente Avansate de Programare în Lisp şi Prolog. Aplicaţii în Inteligenţa Artificială*, Editura Albastră, Cluj-Napoca, 2012 (270 pages).

Representative articles:

1. (with D. Dumitrescu) Convex Decomposition of Fuzzy Partitions, *Fuzzy Sets and Systems*, Part I: 73, 3 (1995), 365–376; Part II: 96, 1 (1998), 111–118.
2. (with C. Sârbu, O. Horowitz, D. Dumitrescu) A Fuzzy Classification of the Chemical Elements, *Journal of Chemical Information and Computer Sciences*, 36, 3 (1996), 465–482.
3. (with C. Sârbu, O. Horowitz) Fuzzy Cross-Classification of the Chemical Elements, Based Both on Their Physical, Chemical and Structural Features, *Journal of Chemical Information and Computer Sciences*, 36, 6 (1996), 1098–1108.
4. (with C. Sârbu) A New Fuzzy Regression Algorithm, *Analytical Chemistry*, 68, 5 (1996), 771–778.

5. (with C. Sârbu) The Fuzzy Hierarchical Cross-Clustering Algorithm. Improvements and Comparative Study, *Journal of Chemical Information and Computer Sciences*, 37, 3 (1997), 510–516.

6. (with C. Sârbu) Fuzzy Robust Estimation of Central Location, *Talanta*, 54 (2001), 125–130.

7. (with C. Sârbu) Principal Component Analysis versus Fuzzy Principal Component Analysis. A Case Study: The Quality of Danube Water (1985–1996), *Talanta*, 65 (2005), 1215–1220.

8. (with X. Fei, S. Lu, L.R. Liang,) GFBA: A Genetic Fuzzy Biclustering Algorithm for Discovering Value-Coherent Biclusters, *Proc. 2007 International Symposium on Bioinformatics Research and Applications*, Georgia State University, Atlanta, May 6–9 2007, *LNCS* 4463, Springer, 2007, 1–12.

9. (with L. Tan, F. Fotouhi, W. Grosky, N. Mouaddib) Improving Similarity Join Algorithms Using Fuzzy Clustering Technique, *Proc. 2009 IEEE International Conference on Data Mining Workshops*, Miami, Florida, December 6–9, 2009, IEEE Computer Society, 545–550.

10. (with C. Sârbu) A New Fuzzy Discriminant Analysis Method, *MATCH – Communications in Mathematical and in Computer Chemistry*, 69, 2 (2013), 391–412.

Personal web page: http://hfpop.ro

POPA, Alexandru

Born on December 9, 1986, Bucharest, Romania.

Education: Bachelor degree, University of Bucharest (2005–2008).

PhD: University of Bristol, UK, 2011. Thesis title: *Approximation Lower and Upper Bounds for a Selection of Combinatorial Optimization Problems.* Scientific advisor: Bogdan Warinschi.

Scholarships, postdoc stages: Postdoc, Aalto University, Finland, 2011–2013.

Positions: Assistant Professor, Masaryk University, Czech Republic, 2013–2015; Assistant Professor, Nazarbayev University, Kazakhstan, 2015–2016; Associate Professor, University of Bucharest, Romania, since 2016.

Research areas: Algorithms, complexity, graphs, combinatorial optimization.

Main results:

My researches are mainly in the area of algorithms and one of the main results is an approximation algorithm for a problem named *min sum 2-paths*. This result opened the way to an exact polynomial algorithm for the min sum 2-paths problem, which resolved a 40 years old open problem.

Another notable result is a polynomial time exact algorithm for a problem from computational genomics which was believed to be **NP**-hard. I also mention the results in the field of fixed parameter algorithms in **P**, which were published in SODA 2018, one of the best conferences on algorithms.

PhD students: K. Ashik Matthew (co-supervisor, 2015), Radu-Ștefan Mincu (current student), Camelia Obreja (current student).

Representative articles:

1. (with D. Coudert, G. Ducoffe) Fully Polynomial FPT Algorithms for Some Classes of Bounded Clique-Width Graphs, *Symposium on Discrete Algorithms* (SODA), 2018.

2. (with P. Kaski, P.R.J. Ostergard) Enumeration of Steiner Triple Systems with Subsystems, *Mathematics of Computation*, 84 (2015), 3051–3067.

3. (with Al. Tomescu, T. Gagie, R. Rizzi, A. Kuosmanen, V. Makinen) Explaining a Weighted DAG with Few Paths for Solving Genome-Guided Multiassembly, *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 12, 6 (2015), 1345–1354.

4. (with A.F. Anta, N. Nicolaou) Making "Fast" Atomic Operations Computationally Tractable, *OPODIS* 2015.

5. (with S. Ordyniak) A Parameterized Study of Maximum Generalized Function and Pattern Matching Problems, *Algorithmica*, 75, 1 (2015), 1–26.

6. (with A. Adamaszek) Algorithmic and Hardness Results for the Colorful Components Problems, *Algorithmica*, 73, 2 (2014), 1–8.

7. (with T. Fenner, O. Lachish) Min-Sum 2-Paths Problems, *Theory of Computing Systems*, 58, 1 (2014), 94–110.

8. (with T. Larjomaa) The Min-Max Edge *q*-Coloring Problem, *Journal of Graph Algorithms and Applications*, 19, 1 (2015), 507–528.

9. Approximating the Rainbow – Better Lower and Upper Bounds, *International Computing and Combinatorics Conference* (COCOON), 2012

10. Modelling the Power Supply Network – Hardness and Approximation, *Theory and Applications of Models of Computation* (TAMC), 2013.

Further information:

I am passionate about popularizing science and I have participated in several popular science competitions in Romania and Finland. Also, I have written a book, *Dragoste în Coreea de Nord* (*Romance in North Korea*), inspired from a trip I took in North Korea.

Personal web page: alexpopa.neocities.org

POPESCU, Andrei

Born on September 6, 1978, in Craiova, Romania.

Education:
BSc in computer science, University of Bucharest, Romania, 2001.
MSc in computer science, University of Bucharest, Romania, 2003.

PhD in computer science, University of Illinois at Urbana-Champaign, United States, 2010. Thesis title: *Contributions to the Theory of Syntax with Bindings and to Process Algebra.* Scientific advisors: Elsa Gunter and Grigore Roşu.
PhD in mathematics, University of Bucharest, Romania, 2006. Thesis title: *Many-Valued Relation Algebras.* Scientific advisor: George Georgescu.

Scholarships, postdoc stages:
2010–2014: Postdoctoral researcher, Technische Universität München, Germany.

Positions:
From 2014: Senior Lecturer, Middlesex University, London, United Kingdom.
From 2008: Researcher, Institute of Mathematics "Simion Stoilow", Bucharest, Romania.

Research areas: My current research is centered around proof assistant infrastructure and verification of information flow security. In the past, I worked on fuzzy logic and abstract model theory.

Main results:
Specification mechanisms. My largest ongoing research endeavor consists of endowing higher-order logic (HOL), and the proof assistant Isabelle/HOL in particular, with flexible specification mechanisms for (co)datatypes and (co)recursive function definitions. During my PhD in Urbana, I focused on datatypes and reasoning principles for syntax with bindings. Moving to Munich, I looked into a modular approach to specifying standard datatypes and codatatypes (not involving binders). This approach has spawned a major project that over the years has recruited several colleagues and students, starting with J. Blanchette and D. Traytel, who became longstanding contributors. Building on, and often improving upon the state of the art in category theory, this work has led to breakthroughs in proof assistant technology: (Co)datatypes can now be arbitrarily nested with freely and non-freely

generated (co)datatypes, and they support a sound mixture of recursion and corecursion, these go well beyond the previously known capabilities of proof assistants.

Logical foundations of proof assistants. I have resolved some open problems in the foundations of proof assistants based on HOL: sound criteria for the consistency of HOL with ad-hoc overloading (which is the underlying logic of Isabelle/HOL), the conservativity of HOL definitions, and the possibility to extend HOL with local type definitions.

Verification of information-flow security. The most recent part of my research is the design of fine-grained notions of information flow security and their employment in the verification of web-based systems. This work has produced the CoCon conference management system and the CoSMed social media platform – the world's first of their kind to be have been verified for confidentiality at the code level.

Other work. I participated at the development of Isabelle's very popular tool Sledgehammer, by co-designing and formally proving correct (sound and complete) the variety of type encodings from HOL to first-order logic that form Sledgehammer's backbone. In the more distant past, I worked on fuzzy logic and abstract model theory. I contributed the most general formulations to date of two classical results in logic (Robinson's consistency theorem and Tarski's elementary chain theorem). They were included in the standard reference book on institution-independent model theory (by Răzvan Diaconescu).

Honors, prizes, scientific distinctions:

2012: Best Paper Award for 2012/2013, offered by the DFG priority program Reliably Secure Software Systems (RS3) for my paper "Proving Concurrent Noninterference".

2007: Mavis Memorial Fund Scholarship Award, offered by the University of Illinois at Urbana-Champaign College of Engineering.

2004: Saburo Muroga Fellowship for outstanding graduate students, offered by the University of Illinois at Urbana-Champaign Department of Computer Science.

PhD students: Lorenzo Gheri (2015–2018, PhD student), Ping Hou (2016–2018, postdoctoral fellow).

Representative articles:

1. (with O. Kuncar) Safety and Conservativity for HOL and Isabelle/HOL*, *Proc. Principles of Programming Languages* (*POPL* 2018), 24(1)–24(26), 2018.

2. (with O. Kuncar) From Types to Sets by Local Type Definitions in Higher-Order Logic, *J. Automated Reasoning,* to appear in 2018 (special issue dedicated to ITP 2016).

3. (with J. Blanchette, F. Meier, D. Traytel) Foundational Nonuniform (Co)datatypes for Higher-Order Logic, *Proc. Logic in Computer Science* (*LICS* 2017), ACM, 2017, 1–12.

4. (with J. Blanchette, A. Bouzy, A. Lochbihler, D. Traytel) Friends with Benefits: Implementing Corecursion in Foundational Proof Assistants, *Proc. European Symposium on Programming* (*ESOP* 2017), *LNCS* 10201, Springer, 2017, 111–140.

5. (with O. Kuncar) Comprehending Isabelle/HOL's Consistency, *Proc. European Symposium on Programming* (*ESOP* 2017), *LNCS* 10201, Springer, 2017, 724–749.

6. (with J. Blanchette, D. Traytel) Foundational Extensible Corecursion – A Proof Assistant Perspective, *Proc. International Conference on Functional Programming* (*ICFP* 2015), ACM, 2015, 192–204.

7. (with J. Blanchette, D. Traytel) Witnessing (Co)datatypes, *Proc. European Symposium on Programming* (*ESOP* 2015), *LNCS* 9032, Springer, 2015, 359–382.

8. (with D. Traytel, J. Blanchette) Foundational, Compositional (Co)datatypes for Higher-Order Logic: Category Theory Applied to Theorem Proving, *Proc. Logic in Computer Science* (*LICS* 2012), IEEE, 2012, 596–605.

9. (with E. Gunter) Recursion Principles for Syntax with Bindings and Substitution, *Proc. International Conference on Functional Programming* (*ICFP* 2011), ACM, 2011, 346–358.

10. (with E. Gunter, C. Osborn) Strong Normalization for System F by HOAS on Top of FOAS, *Proc. Logic in Computer Science* (*LICS* 2010), IEEE, 2010, 31–40.

Further information:

Steering committee membership: 2017–2020 – Automated Reasoning with Analytic Tableaux and Related Methods (TABLEAUX).

Program committee membership: 2018 – Interactive Theorem Proving (ITP); 2017: Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM): 2016 – Joint Conference on Automated Reasoning (IJCAR); 2016 – Interactive Theorem Proving (ITP); 2016 – Certified Programs and Proofs (CPP); 2015 – Automated Reasoning with Analytic Tableaux and Related Methods (TABLEAUX).

Personal web page: http://www.andreipopescu.uk

REZUŞ, Adrian

Born on October 29, 1949, in Rădăuți, Romania.

Education: Philosophy: Iaşi, Faculty of History and Philosphy, and Bucharest, Faculty of Philosophy, 1967–1972. Licentiate thesis (Bucharest 1972): *Significatio and Suppositio in the Early Medieval Logic*.

Mathematics: Geneva, CH, Faculté des Sciences, Institut de Mathématiques, and Utrecht, Mathematical Institute, 1977–1981.

PhD: University of Utrecht, 1981. Thesis title: *Lambda Conversion and Logic.* Scientific advisors: Dirk van Dalen and Henk Barendregt.

Scholarships, postdoc stages: Eindhoven University of Technology, Department of Mathematics and Computing Science (Chair of Analysis/Nicolaas G. de Bruijn), postdoc, 1982.

Positions:

– Institute of Philosophy, Bucharest: Researcher, 1972–1975.

– Romanian Academy of Social and Political Sciences, Bucharest: Researcher and Scientific Editor, 1975–1977.

– Utrecht University (Mathematical Institute): Research Assistant to Henk Barendregt (Chair of Mathematical Logic and Foundations of Mathematics / Dirk van Dalen), 1979–1981.

– Eindhoven University of Technology (Department of Mathematics and Computing Science): Research Assistant to the Chair of Analysis/Nicolaas G. de Bruijn (research on Automath) 1982.

– University of Nijmegen (Department of Computer Science, Chair: Computer Architecture and Operating Systems): teaching (undergraduate and graduate level), and research (Boolean algebras, ordered sets, algebraic lattices and Scott domains, denotational semantics for programming constructs, functional programming, type theories, lambda-calculus and applications), 1983–1985.

– ZWO (currently: NWO, the Dutch National Science Research Foundation), The Hague: Senior Researcher, since 1983 (currenty retired).

Research areas: Theoretical computer science (type theories, domain theory, applications of lambda-calculus in proof theory and computing), logic (proof theory – ordinal logic, Curry-Howard for classical logic and susbystems, etc., history of ancient and modern logic).

Main results: (refs. to the bibliography appearing below)

– A revision of Church's ordinal logic [B1].

– Conservativity problems in classical Automath [B2].

– Model theory (denotational semantics) for classical Automath and related proof-systems [A2].

– Denotational semantics for constructive type theory (Per Martin Löf) [A3].

– Confluence and normalisation proofs for impredicative and generalised type theories [B3] [A4] [A5] [A6].

– Witness theory: proof theory for classical logic and susbystems (relevance, modal and linear logics) based on typed lambda-calculus (for exact refs., see the current project: *Witness Theory*, https://www.researchgate.net/project/Witness–theory).

– History of logic: A modern interpretation of Stoic logic [B5], Frege's rule logic as a predecessor of Gentzen (exact ref. https://www.researchgate.net/ project/ Witness-theory), natural deduction as typed lambda-calculus (Łukasiewicz, Jaskowski, Gentzen) [A7] (for more refs. see https://www.researchgate.net/ project/Witness-theory), Rara logico-mathematica (this is a joint editorial project with College Publications, London, http://www.collegepublications.co.uk/logic/; for details, see, e.g., https://www.researchgate.net/project/Rara–logico–mathematica).

Books:

[B1] *Lambda-Conversion and Logic,* Elinkwijk, Utrecht 1981 (Utrecht PhD Diss.).

[B2] *Abstract Automath,* Mathematisch Centrum (CWI), Amsterdam 1983 (Mathematical Centre Tract 160).

[B3] *Impredicative Type Theories* (*Girard-Reynolds Type Theories: Syntax, Model Theory and Formal Pragmatics*), Technical Report TR–KUN–WN–85–1986, University of Nijmegen, Department of Computer Science, Nijmegen 1986, 288 pages.

[B4] *Beyond BHK,* University of Nijmegen 1991 (extended abstract, in Henk Barendregt, Marc Bezem, and Jan Willem Klop, eds.), *Dirk van Dalen Festschrift*, University of Utrecht, Utrecht 1993, 114–120 (Quaestiones Infinitae 5. Publications of the Department of Philosophy, University of Utrecht).

[B5] *An Ancient Logic* (*Chrysippus and His Modern Readers I*), LAP – Lambert Academic Publications, Saarbrücken, 2016.

Representative articles:

[A1] On a Theorem of Tarski, *Libertas Mathematica* (Arlington TX), 2 (1982), 62–95.

[A2] (with H. Barendregt) Semantics for Automath and Related Systems, *Information and Control*, 59 (1983), 127–147.

[A3] Semantics of Constructive Type Theory, *Libertas Mathematica* (Arlington TX), 6 1986, 1–82 (revised reprint: Technical Report TR–KUN–WN–2–1987 (n.s.), University of Nijmegen, Department of Computer Science).

[A4] *Propositions-as-Types Revisited (Higher-Order Constructive Type Theory)*, University of Nijmegen, Department of Computer Science, Technical Report KUN–WN–CS TR–97–1987, February 1987, 91 pages.

[A5] *Varieties of Generalized Functionality*, University of Nijmegen, Department of Computer Science, Technical Report KUN–WN–CS TR–102–1987, February 1987, 106 pages. (With an Appendix by Peter J. de Bruin.)

[A6] *Constructions and Propositional Types*, University of Nijmegen, Department of Computer Science, Technical Report KUN–WN–CS 87–1–1987, April 1987, 64 pages.

[A7] Łukasiewicz, Jaskowski and Natural Deduction (Curry-Howard for Classical Logic), *Bulletin of the IAL* [edited by the Iranian Association for Logic], Tehran 2017.

NB. A larger selection from my published resp. unpublished papers and notes on lambda-calculus and logic will appear in print as *Notes on Logic and Lambda–calculus*. For pre- and re-print samples, see, e.g., http://www.equivalences.org/editions/index–mathesis.html. The specific `witness theoretical' material is scheduled for the monograph *Witness Structures and Computability* announced at https://www.researchgate.net/publication/310832647_Witness_Structures_and_Computability%27%27_forthcoming_monograph_Tentative_ToC_May_25_2016 (to be likely issued by College Publications, London).

Further information:
Currently retired, living in Nijmegen, The Netherlands.

NB. I am highly interested in finding would-be collaborators on the two projects (*Witness Theory* resp. *Rara logico–mathematica*) mentioned above, and, typically, on the applications of the lambda-calculus in logic and in computing (ATTN: graduate students in mathematics [essentially: algebra and category theory], in mathematical logic [proof theory] and/or in computer science, as well as young and / or senior researchers in these areas, including software engineers working in automated reasoning (theorem provers), in the implementation of proof-checkers and / or in software verification, in general).

Personal web: www.equivalences.org. This is the site of the online publishing house *équivalences*, Nijmegen, I am taking care of; for logic and/or theoretical computer science publications, see the section mathesis (http://www.equivalences.org/editions/index–mathesis.html); for cross refs., and pre- resp. re-prints, see academia.edu (http://uu.academia.edu/AdrianRezus), ResearchGate (https://www.researchgate.net/profile/Adrian_Rezus), and LinkedIn (https://nl. linkedin.com/ in/adrian–rezus–9917a11b).

ROGOJIN, Iurie

Born on November 13, 1949, in Berdicev, Ukraine, passed away on March 10, 2014, in Chişinău.

Education: University degree in mathematics, Kuban State University, Krasnodar, Soviet Union (1971).

PhD in mathematical cybernetics, Computer Center of the Russian Academy of Sciences, Moscow, Soviet Union, 1981. Thesis title: *Universal Turing Machines.* Scientific advisor: M. Bushko-Zhuk.

Doctor in Habilitation in mathematical cybernetics, Moscow State University, Department of Computational Mathematics and Cybernetics, Moscow, Russia, 2000. Thesis title: *On Formal Models of Computers ad Computing.*

Positions:

Leading Researcher at the Academy of Sciences of Moldova, Institute of Mathematics and Computer Science and Professor at the University of the Academy of Sciences of Moldova, Chişinau, Moldova (2007–2014).

Senior Researcher at the Rovira i Virgili University, Research Group on Mathematical Linguistics, Tarragona, Spain (2007–2009).

Senior Research Scientist at the Academy of Sciences of Moldova, Institute of Mathematics and Computer Science (1997–2007).

Director of the scientific research laboratory of the Software and Computer Science, Academy of Sciences of Moldova and Scientific Research Center "DELSY" (1981–1997).

Junior Researcher at the Institute of Mathematics and Computer Science, Academy of Sciences of Moldova (1978–1981).

PhD student at the Institute of Mathematics and Computer Science, Academy of Sciences of Moldova (1975–1978).

Lecturer at the Kuban State University, Krasnodar, Russia (1971–1975).

Research areas: Small universal Turing machines, DNA computing, insertion-deletion systems, membrane computing.

Main results:

Iurie's specialty was the construction of small universal computing devices. Most of his research results fall into this category and in many cases he possesses the best known results on this topic for corresponding models.

He has obtained several outstanding results concerning universal Turing machines of a small size. He was the first to systematically investigate the construction of such machines. He showed that there are universal Turing machines of the types *UTM* (24; 2); *UTM* (10; 3); *UTM* (7; 4); *UTM* (5; 5); *UTM* (4; 6); *UTM* (3; 9), and *UTM* (2; 18), where by *UTM*(*m*; *n*) we denote the class of universal Turing machines with *m* states and *n* symbols. A similar investigation was done for the class of circular Post machines, which proved to be very useful for proofs in different areas.

In the area of DNA computing the most important effort was concentrated on splicing-based models. Splicing is a binary word operation of a biological inspiration corresponding to the actions of restriction enzyme and ligase. Iurie has several results constructing small universal or computationally complete devices for various models based on splicing. We cite here the most important results: computational completeness of splicing test tube systems with 3 tubes, of time-varying distributed H systems with 1 component (corresponding to the non-reflexive definition of splicing H systems) and universality of splicing P systems with 5 rules (which is one of the smallest universal devices ever built).

Another important topic of interest are insertion-deletion systems, a model having linguistic, biological, and formal language inspirations. The corresponding operations allow inserting or erasing a substring in a specified context. Iurie has shown more than 15 universal constructions exhibiting small descriptional complexity parameters; in most of the cases the results being optimal. A particular result should be highlighted – the computational completeness of context-free insertion-deletion systems. This remarkable result, lying at the foundations of theoretical computer science, shows that the highest computational power can be achieved by only inserting and deleting strings of size at most 3 in a context-free manner.

In the area of membrane computing he has (co)–authored over 50 publications. The first to be mentioned is a series of papers investigating minimal symport/ antiport, in particular establishing the ultimate results for the computational completeness with two membranes, proved by very creative and highly nontrivial constructions. He also participated in research of transitional P systems, as well as of P systems with active membranes. Other topics of Iurie's systematic interest include using the framework of P systems as an additional control mechanism for such operations as insertion-deletion (including exo-operations) and splicing. In particular, he constructed the smallest known universal P system – with only five rules, the proof displaying how to perform multiple tasks by the same rule.

Other topic of his interest are the networks of evolutionary processors, where he showed a series of results exhibiting small universal constructions.

PhD students: Artiom Alhazov (PhD thesis – 2006, habilitation thesis – 2013), Alexander Krassovitskiy (2011), Sergey Verlan (2004, informal advisor).

Representative articles:

1. Small Universal Turing Machines, *Theoretical Computer Science*, 168, 2 (1996), 215–240.

2. (with M. Kudlek) A Universal Turing Machine with 3 States and 9 Symbols, *Proc. International Conference on Developments in Language Theory*, Springer, 2001, 311–318.

3. (with M. Margenstern, S. Verlan) Time-Varying Distributed H Systems with Parallel Computations: The Problem Is Solved, *Proc. International Workshop on DNA-Based Computers*, 2003, 48–54.

4. (with M. Margenstern, Gh. Păun, S. Verlan) Context-Free Insertion-Deletion Systems, *Theoretical Computer Science*, 330, 2 (2005), 339–348.

5. (with A. Alhazov, R. Freund) Computational Power of Symport/Antiport: History, Advances, and Open Problems, *LNCS* 3850, Springer, 2006, 1–30.

6. (with A. Alhazov) Towards a Characterization of P Systems with Minimal Symport/Antiport and Two Membranes, *LNCS* 4361, Springer, 2006, 135–153.

7. (with A. Alhazov, S. Verlan) On Small Universal Splicing Systems, *Int. J. Found. Comput. Sci*., 23, 7 (2012), 1423–1438.

8. (with A. Alhazov, E. Csuhaj-Varjú, C. Martín-Vide) On the Size of Computationally Complete Hybrid Networks of Evolutionary Processors, *Theoretical Computer Science*, 410, 35 (2009), 3188–3197.

9. (with A. Alhazov, Y. Krassovitskiy, S. Verlan) Small Size Insertion and Deletion Systems, *Scientific Applications of Language Methods. Mathematics, Computing, Language, and Life: Frontiers in Mathematical Linguistics and Language Theory*, vol. 2, World Scientific, 2010, 459–524.

10. (with R. Freund, A. Alhazov, S. Verlan) Communication P Systems, chapter 5 in *The Oxford Handbook of Membrane Computing*, Gh. Păun, G. Rozenberg, A. Salomaa, eds., Oxford Univ. Press, 2010, 118–143.

Further information:

Invited professor: LACL, Université Paris–Est Créteil, France, May–June 2012, March 2013; Faculty of Computer Science and Information Technology, West Pomeranian University of Technology, Szczecin, Poland, June – July, 2010; Vienna University of Technology, scientific collaboration with prof. Rudolf Freund, November 2009; Metz University (France), March – July 1997, January – May, 2001, January – May 2003, April – May, 2004, February – March 2005.

International projects leader: "Power and efficiency of natural computing: neural–like P (membrane) systems", STCU (The Science and Technology Center in Ukraine), 2007–2010, team leader; "Biocomputing – new computational possibilities", CRDF (The US Civilian Research and Development Foundation) and MRDA (Moldovan Research and Development Association), 2003–2005, team leader;

"MolCoNet – A Thematic Network on Molecular Computing", European Commission, 2001–2004, local team leader; "Basics of Molecular Computation", NATO, 2000–2003, local team leader; "Frontier and limitations in the Computer Science: formal models of computers and computations", European Commission, INTAS, 1998–2001, local team leader; "Models of high performance computations based on biological and quantum approaches", STCU (The Science and Technology Center in Ukraine), 2012–2014, team leader.

ROGOJIN, Vladimir

Born on June 2, 1982, in Chişinău, Republic of Moldova.

Education: State University of Moldova, Chişinău, undergraduate 2000–2004 and master 2004–2005.

PhD: Åbo Akademi University, 2009. Thesis title: *Gene Assembly in Stichotrichous Ciliates: Elementary Operations, Parallelism and Computation.* Scientific advisor: Ion Petre.

Scholarships, postdoc stages: Åbo Akademi 2009–2010; University of Helsinki 2010–2013; Åbo Akademi 2013–2018.

Positions: Postdoc at Åbo Akademi 2009–2010; Postdoc University of Helsinki 2010–2013; Postdoc Åbo Akademi 2013–2018; Main specialist at Blockchain technology at Empirica Finland Oy (current).

Research areas: Computational biomodelling, computational systems biology, cryptography and network security with focus on Blockchain technology.

Main results:

Automatic discovery of combined drug therapy (Vladimir Rogojin, Keivan Kazemi, Krishna Kanhaiya, Eugen Czeizler, Ion Petre), in *Proceedings of the Thirteenth International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics* (Andrea Bracciali, David Gilbert, Gilbert Mac Kenzie, eds.), 2016.

The structure of elementary strategies for gene assembly in ciliates (Vladimir Rogojin, Ion Petre), in *Fundamenta Informaticae*, IOS Press, volume 137, 2015.

The phosphorylation of the heat shock factor as a modulator for the heat shock response (Eugen Czeizler, Vladimir Rogojin, Ion Petre), in *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, IEEE/ACM, volume 9, 2012.

Honors, prizes, scientific distinctions:

"NVidia Best paper award" at CMSB 2011 for paper 9 below.

Yearly State Computer Science award for young scientists, offered by Academy of Sciences of Moldova, 2009.

Yearly award of the Institute of Mathematics and Computer Science of Academy of Sciences of Moldova for young scientists, 2009.

PhD students: Charmi Panchal (co-supervised with Ion Petre, 2014–2018).

Representative articles:

1. (with H. Marjonen, A. Sierra, A. Nyman, O. Gröhn, A.-M. Linden, S. Hautaniemi, N. Kaminen-Ahola) Early Maternal Alcohol Consumption Alters Hippocampal DNA Methylation, Gene Expression and Volume in a Mouse Model, *PloS one* 10(5), Public Library of Science, pp. E0124931, 2015.
2. (with T. Harju, I. Petre, G. Rozenberg) Patterns of Simple Gene Assembly in Ciliates, *Discrete Applied Mathematics*, 156, 14 (2008), 2581–2597.
3. (with A. Alhazov, I. Petre) Solutions to Computational Problems Through Gene Assembly, *Natural Computing*, 7, 3 (2008), 385–401.
4. (with I. Petre) Decision Problem for Shuffled Genes, *Information and Computation*, 206, 11 (2008), 1346–1352.
5. (with M. Langille, I. Petre) Three Models for Gene Assembly in Ciliates: A Comparison, *Proc. 3rd International Conference on Bio–Inspired Models of Network, Information and Computing Ssytems, ICST*, http://portal.acm.org/citation.cfm?id=1512533, 2008.
6. (with T.-O. Ishdorj, I. Petre) Computational Power of Intramolecular Gene Assembly, *International Journal of Foundations of Computer Science*, 18, 5 (2007), 1123–1136.
7. (with Ch. Panchal) Generating the Logicome from Microarray Data, *IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB)*, 2017, doi: 10.1109/CIBCB.2017.8058542.
8. (with V. Mitrana, I. Petre) Accepting Splicing Systems, *Theoretical Computer Science*, 411 (2010), 2414–2422.
9. (with E. Czeizler, I. Petre) The Phosphorylation of the Heat Shock Factor as a Modulator for the Heat Shock Response, *Proc. 9th International Conference on Computational Methods in Systems Biology*, ACM, 2011, 9–24.
10. (with A. Alhazov, I. Petre) The Parallel Complexity of Signed Graphs: Decidability Results and an Improved Algorithm, *Theoretical Computer Science*, 410, 24–25 (2009), 2308–2315.

Personal web page: http://www.vrogojin.net

RUDEANU, Sergiu

Born on February 9, 1935, in Iaşi, Romania.

Education: University of Bucharest, Faculty of Mathematics, 1957.

PhD: University of Bucharest, 1964. Thesis title: *Boolean Equations and Their Applications*. Scientific advisor: Grigore C. Moisil.

Positions:
Research Fellow, Institute of Mathematics, Bucharest, 1958–1968;
Associate Professor (1968–1990), Professor (1990–2005), Consultant Professor (since 2005), PhD supervisor (since 1970), University of Bucharest.

Research areas (with numerous and important contributions to all of them): Lattice theory, algebraic logic, universal algebra, Boolean algebra, pseudo-Boolean programming, graph theory.

Editorial boards: *Discrete Mathematics* (from the foundation until 2008), *Multiple-Valued Logic and Soft Computing, Annals of the University of Craiova, Mathematics and Computer Science Series.*

Honors, prizes, scientific distinctions:
Romanian Academy Prize "Gheorghe Ţiţeica", 1968.
Included in *Who's Who in the World*, since 1980–1981.

PhD students: Dan Simovici (1974), Virgil Căzănescu (co-supervised with Gr.C. Moisil; 1976), Sorin Istrail (co-supervised with Solomon Marcus; 1979), Alexandru Filipoiu (1981), Dănuţ Marcu (1981), Mammadou Diallo (1983), Vlad Boicescu (co-supervised with Gr.C. Moisil; 1984), Afrodita Iorgulescu (1984), Gheorghe Ştefănescu (1991), Andrei Baranga (1994), Ioana Leuştean (2004), Florentina Chirteş (2007), Daniel Drăgulici (2008).

Books:
1. *Axiomele laticilor şi ale algebrelor booleene*, Ed. Academiei, Bucureşti 1963.
2. (with P.L. Hammer) *Pseudo-Boolean Methods for Bivalent Programming*. Lecture Notes in Mathematics, 23, Springer, Berlin, 1966.
3. (with P.L. Hammer) *Boolean Methods in Operations Research and Related Areas*, Springer, Berlin, 1968; Dunod, Paris 1970.

4. *Boolean Functions and Equations*, North-Holland, Amsterdam, 1974; Kogaku Tosho, Tokyo, 1984.

5. (with V. Boicescu, A. Filipoiu, G. Georgescu) *Łukasiewicz-Moisil Algebras*, Annals of Discrete Mathematics, 49, North-Holland, Amsterdam, 1991.

6. *Lattice Functions and Equations*, Springer, London 2001.

7. (with R. Padmanabhan) *Axioms for Lattices and Boolean Algebras*, World Scientific, Singapore, 2008.

Representative articles:

1. On Tohma's Decomposition of Logical Functions, *IEEE Trans. Electronic Computers*, EC–14 (1965), 929–931.

2. An Axiomatic Approach to Pseudo-Boolean Programming, *Mat. Vesnik* (Beograd), 7, 22 (1970), 403–414.

3. (with C.H. Cunkle) Rings in Boolean Algebras, *Discrete Math.,* 7 (1974), 41–51.

4. (with F.M. Brown) Consequences, Consistency and Independence in Boolean Algebras, *Notre Dame J. Formal Logic*, 22 (1981), 45–62.

5. On Relatively Pseudocomplemented Posets and Hilbert Algebras, *Ann. Şti. Univ. "Al.I. Cuza" Iaşi*, 31 (1985), supl., 74–77.

6. On Łukasiewicz-Moisil Algebras of Fuzzy Sets, *Studia Logica*, 52 (1993), 95–111.

7. Algebraic Methods Versus Map Methods of Solving Boolean Equations, *Intern. J. Computer Math.*, 80 (2003), 815–817.

8. On the Decomposition of Boolean Functions Via Boolean Equations, *J. Universal Comput. Sci*., 10 (2004), 1294–1301.

9. (with C.S. Calude) Proving as a Computable Procedure, *Fund. Inform*., 64 (2005), 45–52.

10. Localizations and Fractions in Algebra of Logic, *J. Multiple-Valued Logic and Soft Computing*, 2, 2009.

Further information: P. Hammer and S. Rudeanu are the founding fathers of pseudo-Boolean programming (see their 1966 book *Pseudo-Boolean Methods for Bivalent Programming*). For more than four decades this was an active area of pure mathematics, with no forseeble application. In recent years, a particular form of the theory, known as QUBO (Quadratic Unconstrained Binary Optimization), has become the best pattern matching technique in machine learning applications and quantum annealing computing (D-Wave machines). One could think of no better illustration of Moisil's belief in the long term applicability of pure mathematics. (Contribution by Cristian Calude.)

Personal web page: http://fmi.unibuc.ro/ro/departamente/profconsult/rudeanu_sergiu/

SBURLAN, Dragoş-Florin

Born on July 2, 1976, in Bucharest, Romania.

Education:
Faculty of Mathematics and Computer Science at "Ovidius" University of Constanța, Romania (1995–1999).

Advanced studies in computational mathematics and formal languages (2000) and Master of science in computational mathematics and modern computer technologies (2002), at "Ovidius" University of Constanța, Romania.

Advanced studies in logic, theory of computation and artificial intelligence, University of Seville, Spain (2004).

PhD: European PhD at the University of Seville, 2016. Thesis title: *Promoting and Inhibiting Contexts in Membrane Computing*. Scientific advisors: Gheorghe Păun and Mario J. Pérez-Jiménez.

Scholarships, postdoc stages:
Doctoral Grant Becas MAE, Spanish Ministry of Foreign Affairs, Rovira i Virgili University, Tarragona, Spain, 2002–2004.

Academic Staff Training (FPU), Spanish Ministry of Education, Science and Sport, University of Seville, Spain, 2004–2006.

Positions: Assistant Professor (2002–2007), Lecturer (2007–2014), Associate Professor (2014 – present), "Ovidius" University of Constanța, Romania.

Research areas: Formal language theory and computability, natural computing.

Main results regard the development of new computing paradigms and algorithms: studying computational problems in the field of membrane systems, introducing and studying time-free, clock-free, parallel-free multiset rewriting systems and the computing by folding paradigm.

Administrative positions: Director of the Research Centre for Mathematics and Informatics, "Ovidius" University.

Editorial boards: *Analele Ştiinţifice ale Universităţii "Ovidius" din Constanța – seria Matematică* ("Ovidius" University, Constanța, managing editor).

Membership to professional organizations: Societatea de Ştiinţe Matematice din România (SSMR).

Books:

1. (with C. Flaut, C. Sburlan) *Teste de matematică pentru gimnaziu*, Ed. Ex Ponto, Constanţa, 2001.
2. *Membrane Computing Insights. Permitting and Forbidding Contexts*, "Ovidius" University Press, Constanţa, 2010.

Representative articles:

1. (with I.I. Ardelean, M. Cavaliere) Computing Using Signals: From Cells to P Systems, *Soft Computing*, 9, 9 (2005), 631–639.
2. (with M. Cavaliere) Time and Synchronization in Membrane Systems, *Fundamenta Informaticae*, 64, 1–4 (2005), 65–77.
3. Further Results on P Systems with Promoters/Inhibitors, *International Journal of Foundations of Computer Science*, 17, 1 (2006), 205–221.
4. (with M. Cavaliere, R. Freund, M. Oswald) Multiset Random Context Grammars, Checkers, and Transducers, *Theoretical Computer Science*, 372, 2–3 (2007), 136–151.
5. (with R. Brijder, G. Rozenberg, M. Cavaliere, A. Riscos-Núñez) Membrane Systems with Proteins Embedded in Membranes, *Theoretical Computer Science*, 404, 1–2 (2008), 26–39.
6. (with M. Cavaliere) Other Developments, chapter in *The Oxford Handbook of Membrane Computing*, Oxford University Press, 2010, 594–604.
7. (with R. Ceterchi) Membrane Computing and Computer Science, chapter in *The Oxford Handbook of Membrane Computing*, Oxford University Press, 2010, 553–583.
8. Computing by Folding, *International Journal of Computers, Communications & Control*, 6, 4 (2011), 742–751.
9. (with G. Ciobanu) Scenario Based P Systems, *International Journal of Unconventional Computing*, 9, 5–6 (2013), 351–366.
10. (with G. Ciobanu) Monitoring Changes in Dynamic Multiset Systems, *Fundamenta Informaticae*, 134 (2014), 67–82.

Further information: Contributions to several national and international research projects (2017): 3 as director (2 individual and one with research team) and 6 as a member in the research team.

Personal web page: https://sites.google.com/site/dsburlan/

SIMOVICI, Dan

Born on February 15, 1943, in Iaşi, Romania.

Education: MS in electrical engineering, Polytechnical University, Iaşi; MS in mathematics, "Al.I. Cuza" University, Iaşi.

PhD in mathematics, University of Bucharest, 1974. Thesis title: *Contributions to Automata Theory*. Scientific advisor: Sergiu Rudeanu.

Positions:
Professor, University of Massachusetts Boston, Department of Computer Science, 1984–present.
Member of Dana–Farber Cancer Institute, 2010 – present.
Associate Professor, University of Massachusetts Boston, Department of Computer Science, 1982–1983.
Associate Professor, University of Miami, Florida, Department of Mathematics and Computer Science, 1981–1982.
Assistant Professor, University of Iaşi, Romania, Department of Mathematics, 1974–1981.

Research areas: Data mining, machine learning, bioinformatics, theory of formal languages.

Main results:
I have introduced metric space structures generateded by various forms of entropy and examined their applications in clustering, feature selection, classification, and several problems in bioinformatics. I am interested in ultrametric spaces and their applications in data mining; also, I have introduced a measure of interest in the application of data mining to unknown data sets based on their compressibility.

Administrative positions: Computer Science Program director, 1985–present.

Editorial boards: *Journal for Multiple-Valued Logic and Soft Computing.*

Membership to professional organizations: Senior Member IEEE, ACM.

Honors, prizes, scientific distinctions: Honorary Professor, "Al.I Cuza" University, Iaşi, Romania.

PhD students: Dana Cristofor (2002), Laurenţiu Cristofor (2002), Szymon Jaroszewicz (2003), Richard Butterworth (2006), Selim Mimaroglu (2008), Saaid Baraty (2013), Dan Pletea (2013), Rosanne Vertro (2015), Roman Sizov (2018), Kaixun Hua (2018).

Books:

1. *Mathematical Analysis for Machine Learning and Data Mining*, to appear at World Scientific, 2018.
2. *Linear Algebra Tools for Data Mining*, World Scientific, 2012
3. (with C. Djeraba) *Mathematical Tools for Data Mining*, Springer, 2008 (second edition 2015).
4. (with R. Tenney) *Theory of Formal Languages with Applications*, World Scientific, 1999.
5. (with R. Tenney) *Relational Database Systems*, Academic Press, 1995.

Representative articles:

1. (with R. Vetro, K. Hua) Ultrametricity of Dissimilarity Spaces and Its Significance for Data Mining, *EGC 2015, Luxembourg, Revue des Nouvelles Technologies de l'Information*, RNTI E, 28 (2015), 89–100.
2. (with D. Pletea, S. Baraty) Evaluating Data Minability Through Compression – An Experimental Study, *Proc. Data Analytics 2012*, Barcelona, Spain, September 2012, 97–102.
3. (with P. Fomenky, W. Kurz) Polarities, Axiallities, and Marketability, *DaWaK 2012*, Vienna, September 2012, *LNCS* 7448, Springer, 2012, 243–252.
4. (with D. Weisman) Several Remarks on the Metric Space of Genetic Codes, *International Journal of Data Mining and Bioinformatics*, 6 (2012), 17–26.
5. (with M. Breabn, H. Luchian) Entropic-Genetic Clustering, *Revue des Nouvelles Technologies d'Information, Extraction et Gestion des Connaissances*, 2011, Brest, France, 71–76.
6. (with S. Mimaroglu, M. Yagci) Approximative Distance Computation by Random Hashing, *Journal of Supercomputing*, 61, 3 (2012), 572–589.
7. (with R. Vetro, W. Ding) Entropy Quad-Trees for High Complexity Region Detection, *IJSSCI,* 3 (2011), 16–33.
8. (with S. Baraty, C. Zara) The Impact of Triangular Inequality Violations on Medoid-Based Clustering, *Proc. ISMIS* 2011, Warsaw, Poland, June 2011, *Lecture Notes in Artificial Intelligence*, *LNAI* 6804, 2011, 280–289.
9. (with S. Jaroszewicz, T. Scheffer) Scalable Pattern Mining with Bayesian Networks, *Data Mining and Knowledge Discovery*, 18 (2009), 56–100.
10. (with S. Mimaroglu) Mining Approximative Descriptions of Sets Using Rough Sets, *Proc. 39th International Symposium for Multiple-Valued Logic*, Okinawa, Japan, May 2009.

Personal web page: www.cs.umb.edu/~dsim

STATE, Luminița-Doina

Born on January 27, 1948, Crângurile, Dâmbovița county, Romania, passed away on January 2016, in Bucharest.

Education: Bucharest University, Faculty of Mathematics and Mechanics (1965–1970).

PhD in mathematics, University of Bucharest, 1977. Thesis title: *Automated Pattern Recognition; A Statistic Estimation Theory Approach.* Scientific advisor: Silviu Guiaşu.

Scholarships, postdoc stages: Fulbright Fellowship, Brown University, Providence Rhode Island, USA (statistical learning), 1973–1974.

Positions: Teaching Assistant (1965–1978), Lecturer (1979–1991), Associate Professor (1991–1999), all at University of Bucharest, Faculty of Mathematics, Department of Computer Science.

Professor, University of Pitești, Faculty of Mathematics and Computer Science, Department of Computer Science (1999–2013).

Research areas: Statistical learning, pattern recognition; data mining, neural computing; computational intelligence in image processing.

Main results:

– the development of several methods aiming to improve the generalization capacities of linear and nonlinear SVMs;

– the development of a class of PCA-based algorithms for image restoration and compression purposes;

– theoretical and experimental contributions to statistical-based algorithms for noise removal in image processing;

– wavelet-based approaches of noise removal in image processing;

– optimality estimate of MSE matrix parameters for a deterministic linear model based on a feed-forward neural architecture;

– *k*-MBADA algorithm (using *k*-means) for recognition (classification) of corpuscles in electronic microscopy images of serum hepatitis patients.

Administrative positions: Director of the Doctoral School of Computer Science, University of Piteşti, 2002–2016.

Membership to professional organizations: ACM; Information Science and Technology Commission of the Romanian Academy; Expert Evaluator CNCSIS since 2007; Member C.N.A.T.D.C.U (Consiliul Național de Atestare a Titlurilor, Diplomelor şi Certificatelor Universitare), 2006–2010.

Honors, prizes, scientific distinctions: First prize for research, awarded by the VII-th Balkaniade, Belgrad 1978.

PhD students: Doru Constantin (2008), Cătălina Cocianu (2009), Iuliana Munteanu (2011), Corina Săraru (2011), Nicolae Popescu-Bodorin (2012), Corina Calnegru (2014), Andrei Sabău (2017).

Books:

1. *Elements of Mathematical Logics and Automated Theorem Proving* (in Romanian), Bucharest University Publ. House, 1989.
2. (with C.-L. Cocianu) *Classification Techniques with Applications in Document Data Analysis* (in Romanian), ASE Publ. House, Bucharest, 2008.
3. (with I. Paraschiv-Munteanu) *Introduction to Statistical Theory of Pattern Recognition* (in Romanian), Piteşti Univ. Publ. House, 2009.
4. (with C.-L Cocianu, P. Vlamos) *Statistical-Based Approaches for Noise Removal*, chapter in *Image Restoration. Recent Advances and Applications,* InTech, 2012.

Representative articles:

1. An Extension of Lerman's Classification Algorithm, *Bull. Math. de la Soc. Sci. Math.*, 21, 69 (1977).
2. Convergence Properties of a Learning Algorithm for Non-Parametric Pattern Recognition, *Bull. Math.*, 1988.
3. (with C.-L. Cocianu) A Connectionist Approach of the Bayesian Pattern Classifier Adaptive Learning, *Romanian Journal of Information Science and Technology* (ROMJIST), 6, 1–2 (2003), 249–259.
4. (with C.-L. Cocianu, V. Panayiotis) An Unsupervised Skeleton Based Method to Discover the Structure of the Class System, *Proc. IEEE Research Challenges in Information Science – RCIS 2008*, Marrakech, Morocco, 2008, 169–178.
5. (with C.-L. Cocianu, V. Panayiotis) A New Adaptive PCA Scheme for Noise Removal in Image Processing, *Proc. 50th International Symposium ELMAR,* Zadar, Croatia, September 10–12, 2008, 129–132.

6. (with C.-L. Cocianu, C. Săraru, V. Panayiotis) New Approaches in Image Compression and Noise Removal, *Proc. First International Conference on Advances in Satellite and Space Communications*, SPACOMM 2009, Colmar, France, 96–101.

7. (with C.-L. Cocianu, V. Panayiotis, D. Constantin) PCA Supervised and Unsupervised Classifiers in Signal Processing, *Proc. 9th International Workshop on Pattern Recognition in Information Systems* (*PRIS* 2009), Milan, Italy, 2009.

8. (with I. Paraschiv-Munteanu) A New Linear Classifier Based on Combining Supervised and Unsupervised Techniques, *International Journal of Computers, Communications & Control*, 6, 1 (2011), 175–186.

9. (with I. Paraschiv-Munteanu) Learning from Data using Multivariate Linear Models, *Coping with Complexity, COPCOM 2011*, Editura Casa Cărții de Știință (D. Dumitrescu, R.I. Lung, L. Cremene, eds.), 2011, 20–31.

10. (with C.-L. Cocianu, M. Mircea) Heuristic Attempts to Improve the Generalization Capacities in Learning SVMs, *13th ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing, SNPD* 2012, Kyoto, Japan, August 8–10, 2012, 108–113.

Personal web page: https://ro.wikipedia.org/wiki/Lumini%C8%9Ba_State
(Pages contributed by Tudor Bălănescu)

STOEAN, Cătălin-Liviu

Born on August 31, 1979, in Craiova, Dolj county, Romania.

Education:
1998–2002: BSc, Department of Computer Science, Faculty of Mathematics and Computer Science, University of Craiova, Romania
2002–2003: MSc in artificial intelligence, Department of Computer Science, Faculty of Mathematics and Computer Science, University of Craiova, Romania.

PhD in computer science, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University of Cluj-Napoca, Romania, 2008. Thesis title: *New Evolutionary Techniques in Multi-Modal Optimization.* Scientific advisor: Dan Dumitrescu.

Scholarships, postdoc stages:
Fulbright Senior Award, *Automated Learning Models for Cancerous Tissue Detection: from Traditional Classifiers to Deep Architectures*, University of Illinois at Urbana-Champaign, USA (2018, 3 months).
DAAD (Deutscher Akademischer Austausch Dienst) Research Grant A/09/02567, Research Stays and Study Visits for University Academics and Scientists, *An Evolutionary Approach for Estimating the Number and Sizes of Attraction Basins for Optimization Problems with Static and Dynamic Landscapes*, TU Dortmund University (2 months) and Cologne University of Applied Sciences, 2009 (1 month), Germany.
DAAD Research Grant for doctoral students, young academics and researchers, A/06/90461, *Novel Evolutionary Algorithms for Classification. Application to e–Health*, Chair of Algorithm Engineering, Faculty of Computer Science, TU Dortmund, Germany, 2007 (4 months).

Positions: Assistant Lecturer (2003–2006), Assistant Professor (2006–2012), lecturer (2012–2014), Department of Computer Science, Faculty of Mathematics and Computer Science, University of Craiova, Associate Professor (2014 – present), Department of Computer Science, Faculty of Sciences, University of Craiova.

Research areas: Evolutionary computation, multimodal optimization, soft computing, medical image processing, classification, machine learning.

Main results:

I have investigated multimodal optimization problems with a general aim of decreasing the computational cost. One of the tasks of this research was to find new ways to assess the landscape for the objective function of a problem under a low computational budget.

Another pursued objective was to develop novel, easy to configure evolutionary techniques for multimodal optimization via non-standard means. For instance, the radius parameter that usually separates subpopulations of candidate solutions was replaced by the use of space topology or clustering techniques.

The developed tools were validated through their application on a large variety of benchmark problems, from function optimization to machine learning. The research that concerns the latter especially refers to the creation of original computational means for classifying data, mainly addressing test cases from the medical field. For some given data, the designed tools establish the connection between attribute values and previously known outcome and then use such information to predict an output for new samples. The human experts need however to trust the automatic output, so a further step concerned the provision of the machine rationale for the user, e.g., what are the indicators that are the most influential for reaching the decision.

Recently, the source of data provided for learning was changed from alpha-numerical to images, as coordinator of a grant of type partnerships that also involved a university of medicine and a company from industry. The focus was on developing artificial learners for image interpretation. The first direction departed from landmarks discovered through segmentation and numerical feature extraction by quantifying morphological, textural and topological features, followed by different feature selection approaches and classification. Subsequently, another path has been developed, like combining state-of-the-art machine learning techniques by means of differential evolution on the base of their outcome in the form of probabilities from the application on a validation image set. A degree of confidence is also defined that allows the human experts to separate the data into two distinct sets, one that is correctly classified with a high certainty and the rest that would need their further attention.

Membership to professional organizations:

Center for Advanced Research in Applied Computer Science, University of Craiova, Romania.

Society for Computing Technologies, director for research since 2009.

Honors, prizes, scientific distinctions:

Honorary diploma, first place within the Department of Computer Science, Faculty of Sciences, Excellence Research Gala, University of Craiova, 2016.

The “Grigore C. Moisil” Prize of the Romanian Academy in 2008 for a co-authored collection of publications from 2006.

Books:

1. (with R. Stoean) *Support Vector Machines and Evolutionary Algorithms for Classification – Single or Together?*, Intelligent Systems Reference Library, Springer, Vol. 69, 2014.

2. (with R. Stoean) *Evoluţie şi inteligenţă artificială. Paradigme moderne şi aplicaţii*, Editura Albastră – Grupul MicroInformatica, 2010.

3. *Evolutionary Heuristics for Multimodal Optimization. Application to Data Mining, Research Center for Artificial Intelligence*, Computer Science Series, Universitaria Publishing House, Craiova, 2008.

Representative articles:

1. (with R. Stoean, A. Săndiţă, C. Mesina, C.L. Gruia, D. Ciobanu) How Much and Where to Use Manual Guidance in the Computational Detection of Contours for Histopathological Images?, *Soft Computing,* in press, 2018, doi 10.10007/s00500-018-3029-9..

2. (with R. Stoean) Post-Evolution of Variable-Length Class Prototypes to Unlock Decision Making Within Support Vector Machines, *Applied Soft Computing*, 25 (2014), 159–173.

3. (with M. Preuss, R. Stoean, D. Dumitrescu) Multimodal Optimization by Means of a Topological Species Conservation Algorithm, *IEEE Transactions on Evolutionary Computation*, 14, 6 (2010), 842–864.

4. (with R. Stoean, M. Lupşor, H. Ştefănescu, R. Badea) Feature Selection for a Cooperative Coevolutionary Classifier in Liver Fibrosis Diagnosis, *Computers in Biology and Medicine*, 41, 4 (2011), 238–246.

5. (with M. Preuss, R. Stoean) Eak-Based Parameter Tuning of Multimodal Optimization Performance by Means of Different Surrogate Models, *The ACM Genetic and Evolutionary Computation Conference* (*ACM GECCO*), *Workshop on Problem Understanding and Real-World Optimization*, 2013, 1063–1070.

6. (with R. Stoean, A. Sandiţă, D. Ciobanu, C. Mesina, C.L. Gruia) SVM-Based Cancer Grading from Histopathological Images using Morphological and Topological Features of Glands and Nuclei, *Intelligent Interactive Multimedia Systems and Services, 55, Smart Innovation, Systems and Technologies*, Springer, 2016, 145–155.

7. (with D. Lichtblau) Classifier Result Aggregation for Automatically Grading Histopathological Images, *19th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing* (*SYNASC*), Timişoara, September 21–24, 2017, in press.

8. In Search of the Optimal Set of Indicators when Classifying Histopathological Images, *IEEE Post-Proc. 18th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing* (*SYNASC*), Timişoara, 2016, 449–455.

9. (with M. Preuss, R. Stoean, D. Dumitrescu) EA-Powered Basin Number Estimation by Means of Preservation and Exploration, *10th International Conference on Parallel Problem Solving from Nature*, PPSN X, Dortmund, Germany, September 13–17, 2008, *LNCS* 5199, Springer, 2008, 569–578.

10. (with M. Preuss, R. Stoean) Niching Foundations: Basin Identification on Fixed-Property Generated Landscapes, *The ACM Genetic and Evolutionary Computation Conference* (*GECCO*–2011), Dublin, Ireland, 2011, 837–844.

Personal web page: http://inf.ucv.ro/~cstoean/

STOEAN, Ruxandra

Born on August 2, 1979, in Craiova, Romania.

Education: BSc in computer science, University of Craiova (1998–2002), MSc in computer science, University of Craiova (2002–2003).

PhD in computer science, "Babeş-Bolyai" University of Cluj-Napoca, 2008. Thesis title: *Evolutionary Computation. Application to Data Analysis and Machine Learning.* Scientific advisor: Dan Dumitrescu.

Scholarships, postdoc stages:
Universidad de Málaga (UMA), Spain, Ayuda para estancias de investigadores de reconocido prestigio en la UMA, 2017 (2 months).
Technische Universität Dortmund (TU Dortmund) and Technische Hochschule Köln (TH Köln), Germany, 2009 (3 months), Deutscher Akademischer Austausch Dienst (DAAD), Research Stays and Study Visits for University Academics and Scientists, No. A/09/02566.

Positions: Assistant Lecturer (2003–2006), Assistant Professor (2006–2012), Lecturer (2012–2014), Associate Professor (2014 – present), University of Craiova.

Research areas: Machine learning, deep learning, evolutionary optimization.

Main results:
The personal research work targeted model development within traditional machine learning as well as within the current popular field of deep learning, with an emphasis on optimization. Therefore, evolutionary algorithms (EA) brought novel improvements to support vector machines (SVM) and deep convolutional neural networks (CNN). The principal results of the undertaken research are summarized below.

The SVM primal optimization problem was alternatively solved by an EA for continuous data in a framework for classification and regression. The EA encoding of the optimal weights and bias additionally allows the use of nonstandard kernels. Moreover, feature selection can be simultaneously achieved within the same EA model.

SVM learning was followed by a multimodal EA (again for continuous data) that extracts decision guidelines, leading to a well-performing and still highly

comprehensible model tandem. A cooperative coevolutionary technique maneuvers populations of class prototypes (with thresholds for every attribute) that collaborate at fitness evaluation toward an accurate class discriminative set. Feature selection can be embedded again into this encoding, either online (with evolution) or offline (by cleaning the obtained class prototypes). The theoretical findings were applied on real-world numerical data for cancer diagnosis.

The EA management of class prototypes was alternatively considered to include all centroids into the same individual in a generalized approach to handle tasks of either continuous or discrete nature.

EA selection of the most important regressors was also attached to an ARIMA model for stock price time series forecasting. The practical results had been exploited within a directed national grant of the type innovation cheques.

With its highly accurate and independent feature extraction capabilities, CNN only has the drawback of a difficult parameterization. In this respect, an EA was employed to select the appropriate values for the convolutional hyperparameters kernel sizes and depths. Since the deep learning paradigm is also known for its demanding computational resources, the evolution of the hyperparameters was performed using surrogate models instead of CNN. The proposed EA can moreover highlight the importance of each convolutional hyperparameter for the learning performance. The theoretical model had been additionally tested for practical efficiency in the real-world environment of medical images.

Editorial boards: Academic editor *PLOS ONE.*

Honors, prizes, scientific distinctions: "Grigore C. Moisil" Prize of the Romanian Academy for a collection of co-authored publications, 2006 (awarded in 2008).

Books:

1. (with C. Stoean) *Support Vector Machines and Evolutionary Algorithms for Classification. Single or Together?*, Intelligent Systems Reference Library, Springer, Volume 69, 2014.
2. (with C. Stoean) *Evoluţie şi inteligenţă artificială. Paradigme moderne şi aplicaţii* (in Romanian), Editura Albastră – Grupul MicroInformatica, 2010.
3. *Support Vector Machines. An Evolutionary Resembling Approach,* Universitaria Publishing House, Craiova, 2008.

Representative articles:

1. (with M. Atencia) Non-Negative Matrix Factorization for Medical Imaging, *European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning* (ESANN 2018), in press, 2018.
2. (with C. Stoean, A. Săndiţă, D. Ciobanu, C. Mesina) Interpreting Decision Support from Multiple Classifiers for Predicting Length of Stay in Patients with Colorectal Carcinoma, *Neural Processing Letters*, 46 (2017), 811–827.

3. (with C. Stoean, A. Săndiță) Evolutionary Regressor Selection in ARIMA Model for Stock Price Time Series Forecasting, *Smart Innovation, Systems and Technologies* (IDT 2017), Springer, 73 (2017), 117–126.

4. (with Ş. Postăvaru, C. Stoean, G. Joya Caparros) Adaptation of Deep Convolutional Neural Networks for Cancer Grading from Histopathological Images, *Advances in Computational Intelligence* (*IWANN* 2017), *LNCS* 10306, Springer, 2017, 38–49.

5. (with C. Stoean, A. Săndiță, D. Ciobanu, C. Mesina) Ensemble of Classifiers for Length of Stay Prediction in Colorectal Cancer, *Advances in Computational Intelligence* (*IWANN* 2015), *LNCS* 9094, Springer, 2015, 444–457.

6. (with C. Stoean) Modeling Medical Decision Making by Support Vector Machines, Explaining by Rules of Evolutionary Algorithms with Feature Selection, *Expert Systems with Applications*, 40, 7 (2013), 2677–2686.

7. (with C. Stoean, M. Lupşor, H. Ştefănescu, R. Badea) Evolutionary-Driven Support Vector Machines for Determining the Degree of Liver Fibrosis in Chronic Hepatitis C, *Artificial Intelligence in Medicine*, 51, 1 (2011), 53–65.

8. (with M. Preuss, C. Stoean, E. El-Darzi, D. Dumitrescu) Support Vector Machine Learning with an Evolutionary Engine, *Journal of the Operational Research Society*, 60, 8 (2009), 1116–1122.

9. (with M. Preuss, C. Stoean, Elia El-Darzi, D. Dumitrescu) An Evolutionary Approximation for the Coefficients of Decision Functions within a Support Vector Machine Learning Strategy, *Foundations on Computational Intelligence*, 1 (2009), 83–114.

10. (with C. Stoean, M. Preuss, D. Dumitrescu) Evolutionary Multi-Class Support Vector Machines for Classification, *International Journal of Computers, Communications & Control, Supplementary Issue*, 2006, 423–428.

Personal web page: http://inf.ucv.ro/~rstoean/

STREINU, Ileana

Born in Bucharest, Romania.

Education: University of Bucharest, Romania: 1972–1977 (diploma + specialization).

PhD: Univ. of Bucharest, Romania, studies between 1981–1984 (degree formally awarded in 1994). Thesis title: *Grammatical Inference*. Scientific adviser: Solomon Marcus.

PhD, Rutgers University, USA, studies between 1989–1994, title obtained in 1994. Thesis title: *Some Positive and Negative Results in Computational Geometry.* Scientific adviser: William Steiger.

Positions:

– Programmer, then Researcher, Institute for Management and Informatics (ICI), Bucharest, Romania: 1977–1988,

– Teaching/Research Assistant, Instructor, Rutgers University 1989–1994,

– Assistant Professor (1994–2000), Associate Professor (2000–2003), Full Professor (2003 – present), Charles N. Clark endowed Chair Professor (2009 – present), Smith College, Massachusetts, USA,

– Adjoint Professor (2003–present), University of Massachusetts Amherst, USA,

– visiting research positions: Univ. Politecnica de Catalunia, Barcelona, Spain (Fall 1998), Stanford University USA (Fall 2002), École Normale Supérieure Paris, France (Spring 2003), INRIA/LORIA Nancy, France (June 2003), Univ. Hamburg, Germany (June 2005), Kyoto University of Engineering and Architecture, Japan (July 2005), Technische Universität Berlin, Germany (May–Oct. 2006), Euler Institute, St. Petersburg, Russia (June–July 2008), Technische Universität Munchen, Germany (Fall 2013), ICERM Brown University (Fall 2016), Harvard Radcliffe Institute for Advanced Study (2018–2019).

Research areas: Discrete, convex and computational geometry, rigidity theory with applications in theoretical robotics, structural molecular biology and computational materials science.

Main results:

The algorithmic solution to the Carpenter's Rule Problem.

A combinatorial theory for expansive motions based on pseudo-triangulations.

The formulation of periodic rigidity (with C. Borcea), along with a combinatorial characterization and an extension of J.C. Maxwell's polyhedral lifting theorem for stressed frameworks from the finite to the periodic setting.

The theory of auxetic periodic frameworks, developed with C. Borcea.

A characterization of extremal configurations of robot arms with revolute joints (with C. Borcea).

KINARI software for analyzing the rigidity and flexibility of biomolecules (proteins) using novel algorithms and methods from combinatorial rigidity (developed with a group of students).

Administrative positions: department chair, Smith College (2000–2002), founding director of the Four Colleges Biomathematics Consortium (4CBC) and Biomathematics concentration 2011, director 4CBC 2014–15.

Editorial boards: *Discrete and Computational Geometry* (Springer, since 2006); *Contributions to Discrete Mathematics* (since 2005); *SIAM Journal on Algebra, Geometry and Applications* (2017).

Membership to professional organizations: ACM, AMS.

Honors, prizes, scientific distinctions:

Fellow of the American Mathematical Society, inaugural class, 2012.

The 2010 David P. Robbins Prize from the American Mathematical Society.

The 2004 "Grigore C. Moisil" Prize of the Romanian Academy.

PhD students: Audrey Lee (2008), Louis Theran (2010), Naomi Fox (2012), Filip Jagodzinski (2012), Md. Ashraful Alam (2014), John C. Bowers (2015).

Books:

1. *LISP – The Programming Language of Artifcial Intelligence* (in Romanian), Ed. Ştiinţifică şi Enciclopedică, Bucureşti, 1986.

Representative articles:

1. Pseudo-Triangulations, Rigidity and Motion Planning, *Discrete and Computational Geometry*, 34, 4 (2005), 587–635.

2. (with C. Borcea) On the Number of Embeddings of Minimally Rigid Graphs, *Discrete and Computational Geometry*, 31 (2004), 287–303.

3. (with C. Borcea) Periodic Frameworks and Flexibility, *Proceedings of the Royal Society* A 8, 466 (2121), 26332649, 2010.

4. (with N. Fox, F. Jagodzinski, Y. Li) KINARI–Web: A Server for Protein Rigidity Analysis, *Nucleic Acids Research*, 39 (web-server issue), 2011.

5. (with C. Borcea) Liftings and Stresses for Planar Periodic Frameworks, *Discrete and Computational Geometry*, 53, 4 (2015), 747782.

6. (with C. Borcea) Geometric Auxetics, *Proceedings of the Royal Society* A, 471 (20150033), 2015.

Personal web page: http://cs.smith.edu/~streinu

ŞERBĂNUȚĂ, Traian Florin

Born on November 3, 1979, in Braşov, Romania.

Education:
1998–2002: BSc in computer science at University of Bucharest.
2002–2004: MSc in foundations of computer science at University of Bucharest.

PhD in computer science, University of Illinois at Urbana-Champaign, 2010. Thesis title: *A Rewriting Approach to Concurrent Programming Language Design and Semantics.* Scientific adviser: Grigore Roşu.

Scholarships, postdoc stages:
2004–2010: Research Assistant, Formal Methods Laboratory, University of Illinois.
2011–2012: Postdoctoral Research Associate, Information Trust Institute, University of Illinois at Urbana-Champaign.
2011–2013: Postdoctoral Researcher, "Al.I. Cuza" University of Iaşi.

Positions: 2013 – present: Associate Professor of computer science, Faculty of Mathematics and Computer Science, University of Bucharest.

Research areas: Programming languages, formal methods: logics and their applications to computing, algebraic specification, formal methods for software engineering, algorithms, programming using logics, term rewriting and rewriting logic.

Main result: Co-author (with Grigore Roşu) of the K semantics framework.

Representative articles:
1. (with F. Chen, G. Roşu) Maximal Causal Models for Sequentially Consistent Systems, *RV'12, LNCS* 7687, Springer, 2012, 136–150.
2. (with G. Roşu) An Overview of the K Semantic Framework, *J. LAP*, 79, 6 (2010), 397–434.
3. (with G. Roşu, J. Meseguer) A Rewriting Logic Approach to Operational Semantics, *Information and Computation*, 207, 2 (2009), 305–340.
4. Extending Parikh Matrices, *Theoretical Computer Science*, 310, 1 (2004), 233–246.

5. (with D. Lucanu, V. Rusu, A. Arusoaie, A. Ştefănescu, G. Roşu) Language Definitions as Rewrite Theories, *J. Log. Algebr. Meth. Program*., 85, 1 (2016), 98–120.

6. (with D. Lucanu, G. Roşu) K Framework Distilled, in *WRLA*, *LNCS* 7571, Springer, 2012, 31–53.

Personal web page: http://prof.unibuc.ro/traian-florin-serbanuta/

ŞTEFĂNESCU, Alin

Born on December 30, 1975, in Slatina, Olt county, Romania.

Education: Master in computer science (1998–2000) and Bachelor in computer science (1994–1998) at University of Bucharest, Romania.

PhD: University of Stuttgart, Germany, 2006. Thesis title: *Automatic Synthesis of Distributed Transition Systems*. Scientific adviser: Javier Esparza.

Scholarships, postdoc stages:
Postdoc: 2005–2006, University of Konstanz, Germany.
PhD scholarship: 2001–2003, University of Edinburgh, Scotland.
PhD scholarship: 2000–2001, Technical University of Munich, Germany.

Positions:
October 2017 – present: Full Professor in the Computer Science Department of University of Bucharest, Romania.
October 2013 – September 2017: Associate Professor in the Computer Science Department of University of Bucharest, Romania.
July 2015 – September 2016: Senior Researcher in the R&D department of software company INSOFT Development and Consulting, Bucharest, Romania (part-time).
September 2010 – September 2013: Researcher and Lecturer in the Computer Science Department of University of Piteşti, Romania.
July 2010 – September 2013: Research Project Manager in the R&D department of software company Softwin SRL, Bucharest, Romania (part-time).
January 2007 – August 2010: Researcher in the Group of Software and Service Engineering and Architecture, SAP Research, Darmstadt, Germany.
October 1999 – September 2000: Teaching Assistant at the Chair of Foundations of Computer Science, Bucharest University, Romania.

Research areas: Formal methods, model-based testing, synthesis, security, industrial research.

Main results: Various results in the area of sythesis of asynchronous automata, first efficient implementation of them, model-based testing of enterprise services, transfer of theoretical scientific results in industry.

Administrative positions: Head of the Computer Science Department at University of Bucharest since January 2017.

Membership to professional organizations: IEEE.

Honors, prizes:

– Best paper award at ICECCS'14 conference.

– Co-author of a paper at DARS'10 conference, which got a best student paper award (received by PhD student Yushan Chen).

Representative articles:

1. (with L. Lin, R. Su) On Distributed and Parameterized Supervisor Synthesis Problems, *IEEE Transactions on Automatic Control*, 61, 3 (2016), 777–782.

2. (with S. Wieczorek, M. Schur) Message Choreography Modeling. A Domain-Specific Language for Consistent Enterprise Service Integration, *Software and Systems Modeling* (*SoSyM*), 13, 1 (2014), 9–33.

3. (with Y. Chen, X.C. Ding, C. Belta) A Formal Approach to the Deployment of Distributed Robotic Teams, *IEEE Transactions on Robotics*, 28, 1 (2012), 158–171.

4. (with T. Stoenescu, S. Preduț, F. Ipate) RIVER: A Binary Analysis Framework Using Symbolic Execution and Reversible x86 Instructions, *Proc. of 21st International Symposium on Formal Methods* (*FM* 16), *LNCS* 9995, Springer, 2016, 779–785.

5. (with G. Ciobanu, T.S. Hoang) From TiMo to Event-B: Event-Driven Timed Mobility, *Proc. 19th IEEE Int. Conf. on Engineering of Complex Computer Systems* (*ICECCS* 14), IEEE Computer Society, 2014, 1–10 (the paper got a best paper award).

6. (with Y. Chen, X.C. Ding, C. Belta) A Formal Approach to Deployment of Robotic Teams in an Urban-Like Environment, *Proc. of 10th International Symposium on Distributed Autonomous Robotics System* (*DARS* 10), Springer Tracts in Robotics, volume 83, Springer, 2013, 313–327 (the paper got a best student paper award).

7. (with M.F. Wendland, S. Wieczorek) Using the UML Testing Profile for Enterprise Service Choreographies, *Proc. 36th EUROMICRO Conference on Software Engineering and Advanced Applications* (*SEAA* 10), IEEE Computer Society, 2010, 12–19.

8. (with S. Wieczorek, A. Kirshin) MBT4Chor: A Model-Based Testing Approach for Service Choreographies, *Proc. 5th European Conference on Model-Driven Architecture Foundations and Applications* (*ECMDA* 09), *LNCS* 5562, Springer, 2009, 313–324.

9. (with K. Heljanko) Complexity Results for Checking Distributed Implementability, *Proc. 5th International Conference on Application of Concurrency to System Design* (*ACSD* 05), IEEE Computer Society, 2005, 78–87.

10. (with J. Esparza, A. Muscholl) Synthesis of Distributed Algorithms Using Asynchronous Automata, *Proc. International Conference of Concurrency Theory* (*CONCUR* 03), *LNCS* 2761, Springer, 2003, 27–41.

Further information: member of the PC committee of more than 30 conferences and workshops in the area of formal methods or model-driven engineering. PC chair for SERENE 2018 workshop (*LNCS* proceedings).

Personal web page: http://alin.stefanescu.eu/

ŞTEFĂNESCU, Doru

Born on January 19, 1952, in Iaşi, Romania.

Education: University of Bucharest, Faculty of Mathematics, ungraduate studies in mathematics 1971–1975; Master in algebra and geometry (University of Bucharest) 1975–1976.

PhD: University of Bucharest, 1985. Thesis title: *Applications of Transformation Groups to Algebras*. Scientific advisor: Nicolae Radu.

Scholarships: Corso Estivo di Matematica, Perugia, Italy, 1974; Corso Scuola Matematica Interuniversitaria, Cortona, Italy, 1981, 1983.

Positions:

Assistant Professor (1980–1990), lecturer (1990–1993), Associate Professor (1993–2000), Department of Mathematics, Faculty of Physics, University of Bucharest, Romania.

Professor, Department of Theoretical Physics and Mathematics, Faculty of Physics, University of Bucharest, Romania, from 2000 on.

Invited Professor, University of Strasbourg, France, 1999–2002.

Teacher of mathematics, Industrial High School No. 19, Bucharest, from September 1976 to August 1980.

Research areas: Computer algebra, constructive mathematics, algebraic algorithms, philosophy of science, history of mathematics, mathematical education.

Main results:

Description of the algebraic closure of meromorphic formal power series over fields of positive characteristic [1], [2].

Results on computability in analysis and physics [5].

Construction of irreducible polynomials [3], [4], [12].

History of polynomial factorization [10].

Applications of linear recurrent sequences to algorithms for estimation of polynomial roots and sizes of polynomial divisors [9], [12].

Algorithms for estimation of positive roots of univariate polynomials [10], [11], [13].

Proofs and improvements of the polynomial bound of Lagrange [8], [14].

Administrative positions:

Dean, Faculty of Mathematics, Hyperion University (1992–1994).

First vicepresident (2008–2017), vicepresident (2017 on), Romanian Mathematical Society.

President (2009–2013), vicepresident (2015 on), Mathematical Society of Southeastern Europe.

Editorial boards:

Zentralblatt für Mathematik, Romanian Office (local editor-in-chief, 1998–2000); *Bulletin Mathématique de la Société des Sciences Mathématiques de Roumanie* (scientific secretary 1993–2004, associate editor 2004–2008, deputy editor-in-chief 2008–2012, managing editor since 2012); JIPAM (*Journal of Inequalities in Pure and Applied Mathematics,* Melbourne; 2004–2012); *Gazeta Matematică* Seria A (since 2008); *Didactica Matematică* (editor-in-chief, since 2011).

Membership to professional organizations:

Romanian Mathematical Society (1971 on).

Gesellschaft für Angewandte Mathematik und Mechanik (1987 on).

American Mathematical Society (1982 on).

Honors:

Third Prize, Romanian Mathematical Olympiad, 1969.

First Prize, Balkanyade of Young Researchers, 1982.

Professor Emeritus, University of Bucharest, 2017.

Books:

1. *Mathematical Models in Physics* (in Romanian), University of Bucharest, 1984.

2. (with M. Mignotte) *Polynomials – an Algorithmic Approach*, Springer, Berlin, 1999.

Representative papers:

1. A Method to Obtain Algebraic Elements Over $k((T))$, *Bull. Math. Soc. Sci. Math. Roumanie*, 26(74) (1982), 77–91; 27(75) (1983), 169–178.

2. On Meromorphic Formal Power Series, *Bull. Math. Soc. Sci. Math. Roumanie*, 27(75) (1983), 169–178.

3. (with L. Panaitopol) A Resultant Condition for the Irredcibility of Polynomials, *Journal of Number Theory*, 25 (1987), 107–111.

4. (with L. Panaitopol) On the Generalized Difference Polynomials, *Pacific J. Math*., 143 (1990), 341–348.

5. (with D. Bridges, C. Calude, B. Pavlov) The Constructive Implicit Theorem and Applications in Mechanics, *Chaos, Solitons & Fractals*, 10 (1999), 927–934.

6. (with M. Mignotte) Estimates for Polynomial Roots, A*ppl. Alg. Eng. Comm. Comp.*, 12 (2001), 437–453.

7. (with M. Mignotte) La première méthode générale de factorisation des polynômes, *Revue d'Hist. Math*., 7 (2001), 101–123.

8. (with M. Mignotte) On an Estimation of Polynomial Roots by Lagrange, IRMA Strasbourg, 2002 (23 pages), https://hal.archives-ouvertes.fr/hal-00129675.

9. (with M. Mignotte) Linear Recurrent Sequences and Polynomial Roots, *J. Symb. Comp.*, 35 (2003), 637–649.

10. New Bounds for Positive Roots of Polynomials, *J. Univ. Comp. Sci.*, 2005, 2132–2141.

11. Bounds for Real Roots and Applications to Orthogonal Polynomials, *LNCS* 4770, Springer, 2007, 377–391.

12. Constructions of Classes of Irreducible Bivariate Polynomials, *LNCS* 8660, Springer, 2013, 460–471.

13. A New Polynomial Bound and Its Efficiency, *LNCS* 9301, Springer, 2015, 455–467.

14. (with P. Batra, M. Mignotte) Improvements of Lagrange's Bound for Polynomial Roots, *J. Symb. Comp.*, 82 (2017), 19–25.

Further information:

Invited lectures: Freiburg (1994, 2000), Auckland (1994), Hamilton (1994), Mulhouse (1995, 1999, 2000, 2012), Berne (2006), Chişinău (2006), Bonn (2007), Linz (2008), Montréal (2009), Siedlice (2007, 2009, 2010), Corfu (2009), Volos (2010), Moscow (2010, 2016), Dubna (2007, 2008, 2009, 2010, 2012, 2013, 2014, 2015, 2016), Berlin (2013), Warsaw (2014), Aachen (2016).

His works have been cited by more than 400 papers and books including prominent computer scientists and mathematicians (John Abbott, Alkiviadis Akritas, Iannis Emiris, Hoon Hong, Donald E. Knuth, Paolo Ribenboim, Vikram Sharma, Karl Svozil, Elias Tsigaridas). The monograph [2] is cited by 170 authors, while the paper [10] by 51 authors.

ŞTEFĂNESCU, Gheorghe

Born on October 5, 1955, in Valea Mare-Pravăţ, Argeş county, Romania.

Education:

Undergraduate studies in computer science, Faculty of Mathematics, Computer Science Section, University of Bucharest, Romania, 1975–1979.

Master studies in computer science (specialized programming languages), Faculty of Mathematics, Computer Science Section, University of Bucharest, 1979–1980.

PhD in computer science and mathematics, University of Bucharest, Romania, 1991. Thesis title: *Determinism and Nondeterminism in Program Scheme Theory; Algebraic Aspects.* Scientific advisor: Sergiu Rudeanu.

Positions:

Programmer (2980–1082), Junior Research Scientist (1982–1990), Department of Mathematics, The National Institute for Scientific and Technical Creation (INCREST), Bucharest, Romania.

Principal Research Scientist, Institute of Mathematics of the Romanian Academy, Bucharest, Romania (1990–1995).

Associate Professor (1995–2000), Professor (2000 – present), Faculty of Mathematics and Computer Science, University of Bucharest, Bucharest, Romania.

Visiting Positions (selection):

Research Associate, University of Illinois at Urbana–Champaign (February 2008 to February 2009; June – August 2013; June – August 2015).

Senior Fellow, National University of Singapore (August 2001 to August 2004).

Visiting Researcher, Technical University Munich, Germany (July – August 1999; February – March 1999; July 1997; June – August 1994).

Visiting Professor, Graduate School for Logic in Computer Science, Technical University and Ludwig Maximilian University Munich, Germany (December 1997 to February 1998).

Visiting Professor, Department of Informatics, Kyushu University, Fukuoka, Japan (October – December 1997).

Visiting Researcher, Programming Research Group, Faculty of Mathematics and Computer Science, University of Amsterdam, The Netherlands (September – October 1995; January – February 1994).

Visiting Researcher, Department of Philosophy, Utrecht University, The Netherlands (September – October 1994).

Research areas: Formal methods, programming languages, software engineering.

Main results:

Discovery, in 1986, of an algebraic structure for flowcharts modulo graph-isomorphism, as a generalization of regular algebra and iteration theories: This structure was called "biflow" and it is best known today as "trace monoidal category". It was rediscovered in various fields including circuits, dataflow networks, quantum groups, action calculi, etc. A detailed presentation is included in the *Network Algebra* book, Springer, 2000.

Axiomatizations for deterministic and nondeterministic dataflow networks, modulo graph isomorphism or seen as input-output stream processing functions.

Use of space-time duality to get a self-dual model for interactive computation. The model is accompanied with a programming language (Agapia), used for getting structured parallel, interactive programs, compiled over MPI or OpenMP platforms.

Introduction of a new class of 2-dimensional regular expressions, dealing with arbitrary shape 2-dimensional words. These expressions are used to produce adaptive, interactive programming models for heterogeneous self-assembling components.

Administrative positions:

Director, Department of Computer Science, University of Bucharest, from 2009 to 2015.

Director, Doctoral School on Computer Science, University of Bucharest, from 2007 to 2012.

Deputy dean, Faculty of Mathematics and Computer Science, University of Bucharest, 2008.

Member of the Senate, University of Bucharest, Romania, from 2012 to present; President, Senate Hiring Commission, University of Bucharest, 2013–2016.

Chief of the Computer Science Section, Institute of Mathematics of the Romanian Academy, Bucharest, Romania, from March 1990 to February 1992.

Editorial boards: *Journal Universal Computer Science; Annals of University of Bucharest, Mathematics – Computer Science Series.*

Edited journal volumes: *Journal Logic and Algebraic Programming* (special issue on "Streams and Algebra", vol. 78, 2009); *Romanian Journal of Information Science and Technology* (special issue on "Language-Theoretic Models of Distributed Computing – A Collection of Papers in Honour of the 50th Birthday of Victor Mitrana", vol. 12, no. 2, 2009); *Journal Universal Computer Science* (special issue on "Combinatorics and Related Areas – An Workshop in Honour of the 65th Birthday of Ioan Tomescu", vol. 13, no. 11, 2007); *Journal Universal Computer Science* (special issue dedicated to professor Sergiu Rudeanu, vol. 6, January, 2000); *Electronic Notes in Theoretical Computer Science* (special issue, *Proceedings of FCT'99 Workshop on Distributed Systems*, vol. 28, 2000).

Membership to professional organizations: American Mathematical Society, from 1994 to present; European Association for Theoretical Computer Science, from 1990 to 2005; European Association for Computer Science Logic, from 1994 to 2000.

Honors, prizes, scientific distinctions:

BSc in computer science with a perfect score 10/10 and "Diploma of Merit" (1979).

"Grigore C. Moisil" Prize of the Romanian Academy, for year 2000 publications.

PhD students: I.T. Banu-Demergian (2014), C.I. Păduraru (2015).

Books:

1. *Network Algebra*, Springer, Berlin, 2000.
2. *Algebra of Flownomials*, Institute for Informatics, Technical University Munich, 1994 (158 pages).

Representative articles:

1. On Flowchart Theories. Part I: The Deterministic Case, *Journal of Computer and Systems Sciences*, 35 (1987), 163–191.
2. On Flowchart Theories. Part II: The Nondeterministic Case, *Theoretical Computer Science*, 52 (1987), 307–340.
3. Feedback Theories (A Calculus for Isomorphism Classes of Flowchart Schemes), *Revues Roumaine de Mathématiques Pures et Appliquées*, 35 (1990), 73–79.
4. Interactive Systems with Registers and Voices, *Fundamenta Informaticae*, 73, 1–2 (2006), 285–305.
5. (with C. Dragoi) AGAPIA v0.1: A Programming Language for Interactive Systems and Its Typing System, *Electronic Notes in Theoretical Computer Science*, 203, 3 (2008), 69–94.
6. (with C.I. Păduraru, R.S. Mincu) Multi-Level Control Mechanisms for Non-Structured and Structured 2-Dimensional Self-Assembling, *Proc. 11th IEEE International Conference on Self-Adaptive and Self-Organizing Systems*, *SASO* 2017, Tucson, AZ, USA, September 18–22, 2017, 101–110.
7. (with V.E. Căzănescu) Towards a New Algebraic Foundation of Flowchart Scheme Theory, *Fundamenta Informaticae*, 13 (1990), 171–210.
8. (with V.E. Căzănescu) A General Result on Abstract Flowchart Schemes with Applications to the Study of Accessibility, Reduction and Minimization, *Theoretical Computer Science*, 99 (1992), 1–63 (Fundamental study).
9. (with M. Broy) The Algebra of Stream Processing Functions, *Theoretical Computer Science*, 258 (2001), 99–129.

10. A Quest for Kleene Algebra in 2 Dimensions, *Relational and Algebraic Methods in Computer Science – 15th International Conference, RAMiCS* 2015, Braga, Portugal, September 28 – October 1, 2015, 3–26.

Personal web page: http://unibuc.ro/~gstefanescu/

TÎRNĂUCĂ, Cristina (maiden name: Bibire)

Born on July 2, 1979, in Bacău, Romania.

Education:
1998–2003: Bachelor degree in mathematics and computer science by the University of Bucharest, Faculty of Mathematics and Computer Science;
1999–2003: Bachelor degree in economics, Bucharest Academy of Economic Studies, Faculty of Finance, Insurance, Banking and Stock Exchange.

PhD: Rovira i Virgili University, Tarragona, Spain, 2004–2009. Thesis title: *Language Learning with Correction Queries.* Scientific advisor: Victor Mitrana.

Scholarships, postdoc stages:
2004–2008: Rovira i Virgily University (pre-doc) – 4 years FPU (Formación de profesorado universitario) Fellowship awarded by the Spanish Ministry of Education and Science.
2009–2012: University of Cantabria (post-doc) – 3 years Juan de la Cierva Fellowship awarded by the Spanish Ministry of Science and Innovation.

Positions:
2012–2018: Assistant Professor in the Department of Mathematics, Statistics and Computer Science, University of Cantabria, Spain.
March 2018 – present: Associate Professor in the Department of Mathematics, Statistics and Computer Science, University of Cantabria, Spain.

Research areas: Grammatical inference, machine learning, data mining.

Main results: Characterization of the languages classes learnable with correction queries, global optimality in k means clustering.

Editorial boards: *Triangle* (periodical published by the Department of Romance Studies of the Rovira i Virgili University, Tarragona, Spain).

Honors, prizes, scientific distinctions: Best PhD thesis award in the Rovira i Virgili University (2009).

Books:

1. *Correction Queries and Language Learning,* chapter in G. Bel-Enguix, M.D. Jiménez-López, eds., *Language as a Complex System: Interdisciplinary Approaches*, Cambridge Scholars Publishing, England, 2010, 151–196.

2. *Correction Queries in Active Learning,* chapter in C. Martín-Vide, ed., *Scientific Applications of Language Methods*, vol. 2 of the series *Mathematics, Computing, Language, and Life: Frontiers in Mathematical Linguistics and Language Theory,* Imperial College Press, London, 2011, 387–419.

Editor for three special issues:

1. (with S.Z. Fazekas, C. Martín-Vide) *Pre-Proc. 2nd International Conference on Language and Automata Theory and Applications*, Servicio de Publicaciones del Grupo de Investigación en Lingüística Matemática y Computación de la Universidad Rovira i Virgili, Tarragona, vol. 36, 2008.

2. (with C. Martín-Vide) *Proc. 2nd International Conference on Language and Automata Theory and Applications. Information and Computation*, 207, 11 (2009), Elsevier Inc.

3. (with T. Diethe, J.L. Balcázar, J. Shawe-Taylor) *Proc. 2nd Workshop on Applications of Pattern Analysis. Journal of Machine Learning Research: Workshop and Conference Proceedings*, 17 (2011).

Representative articles:

1. (with L. Becerra-Bonache, A.H. Dediu) Learning DFA from Correction and Equivalence Queries, *Proc. 8th International Colloquium on Grammatical Inference (ICGI). Lecture Notes in Artificial Intelligence*, 4201, 2006, 281–292.

2. (with T. Knuutila) Polynomial Time Algorithms for Learning *k*-Reversible Languages and Pattern Languages with Correction Queries, *Proc. 18th International Conference on Algorithmic Learning Theory (ALT)*, *LNCS* 4754, Springer 2007, 264–276.

3. (with C.I. Tîrnăucă) Learning Regular Tree Languages from Correction and Equivalence Queries, *Journal of Automata, Languages and Combinatorics*, 12, 4 (2007), 501–524.

4. (with S. Kobayashi) Necessary and Sufficient Conditions for Learning with Correction Queries, *Theoretical Computer Science*, 410, 47–49 (2009), 5145–5157.

5. (with V. Mitrana) New Bounds for the Query Complexity of an Algorithm that Learns DFAs with Correction and Equivalence Queries, *Acta Informatica*, 48, 1 (2011), 43–50.

6. (with J.L. Montaña, S. Ontañón, A.J. González, L.M. Pardo) Behavioral Modeling Based on Probabilistic Finite Automata: An Empirical Study, *Sensors*, 16, 7 (2016), 958.

7. (with J.L. Montaña, C.L. Alonso, C.E. Borges) Model-Driven Regularization Approach to Straight Line Program Genetic Programming, *Expert Systems with Applications*, 57 (2016), 76–90.

8. (with M. Arias, J.L. Balcázar) Learning Definite Horn Formulas from Closure Queries, *Theoretical Computer Science*, 658, B (2017), 346–356.

9. (with R. Duque, J.L. Montaña) User Interaction Modeling and Profile Extraction in Interactive Systems. A Groupware Application Case Study, *Sensors*, 17, 7 (2017), 1669.

10. (with D. Gómez-Pérez, J.L. Balcázar, J.L. Montaña) Global Optimality in *k*-Means Clustering, *Information Sciences*, 439–440 (2018), 79–94.

Personal web page: http://personales.unican.es/tirnaucac

TOMESCU, Ioan

Born on November 5, 1942, in Ploieşti, Romania.

Education: Undergraduate studies in computer science and mathematics, Faculty of Mathematics, Bucharest University (1960–1965). Degrees: B.A. in computer science and mathematics (1965).

PhD in computer science, Bucharest University, 1971. Thesis title: *Combinatorial Methods in Automata Theory.* Scientific advisor: Grigore C. Moisil.

Scholarships, postdoc stages: Institut d'Informatique d'Entreprise, Paris, and Université Paris 6–Jussieux (6 months, 1974–1975).

Positions:
Professor Emeritus, Department of Computer Science, Faculty of Mathematics and Computer Science, Bucharest University (2011); Professor, Department of Computer Science, Faculty of Mathematics and Computer Science, Bucharest University (1990–2011); Visiting Professor, Abdus Salam School of Mathematical Sciences, Government College University, Lahore, Pakistan (2005–2016); Visiting Senior Research Fellow, School of Computing, National University of Singapore (2002); Visiting Professor, Department of Computer Science, Auckland University, New Zealand (1995); Senior Lecturer, Department of Computer Science, Bucharest University (1972–1990); Visiting Professor, Department of Applied Mathematics, The University of Tirana, Albania (1974); Assistant Professor (1968–1972) and Associate Assistant Professor, Department of Computer Science, Bucharest University (1965–1968).

Research areas: Combinatorics, algorithmic graph theory.

Main results:
Proof of P. Hansen's conjecture: almost all digraphs of order n have a kernel when n tends to infinity [2], by showing that almost all digraphs of order n contain kernels having size between $\log n - \log\log n - 1.43$ and $\log n - \log\log n + 2.11$ and their number lies between $n^{0.913+o(1)}$ and $n^{1+o(1)}$; proof of L. Priese's conjecture (communicated by C.S. Calude) [7]: If the alphabet A contains m symbols and $\limsup k(n)/\log n < 1/\log m$, then almost all words of length n over A contain as factors all words of length $k(n)$ over A as n tends to infinity. This property has been strengthened in [9] as follows: if the additional condition $\lim \log s(n)/\log n = 0$ is imposed, then almost all words w of length n over A have the property that each word of length $k(n)$ over A has at least $s(n)$ occurrences in w.

Introduction of a new combinatorial structure called hypertree, which is useful in extending Bonferroni inequalities [1] and the proof (with M. Zimand) of the property that obtaining a minimum spanning hypertree is an **NP**-hard problem [3].

Introduction (with C.S. Calude) [5] of the notion of optimum extendible prefix code and then, by modifying Huffman's algorithm, designing an efficient algorithm to construct the optimum extension of a non-complete prefix code, provided the initial code was optimal.

In [8] a cascade version of Dantzig's algorithm for matrices over semilattice-ordered semigroups (an algebraic structure introduced by Gr.C. Moisil) was proposed.

Administrative positions:

Head of the Computer Science Chair, Faculty of Mathematics, Bucharest University (1990–2007), scientific secretary, Faculty of Mathematics, Bucharest University (1984–1990), member in Appointment and Promotion Committee and Committee on Mathematics Education (1990–2011), Computer Science PhD Committee (1990–2011), Graduation Executive Committee (1975–2011), Faculty of Mathematics, Bucharest University, leader of the Romanian team for the International Mathematical Olympiad (1983–1986;1990–1994) and for the Balkan Mathematical Olympiad (1990–1994), chairman, Committee on Mathematics Education in Schools, Ministry of Education, Bucharest (1983–1994), vice-president, Romanian Mathematical Society (1996–1999; 2001–2008), honorary president, Romanian Mathematical Society (since 2008), secretary of the Exact Sciences Commission, National Council for Accreditation (1994–2005), member, commission of Mathematics and Exact Sciences, National Council for Scientific Research in Universities (2003–2005), member, National Appointment and Promotion Committee, Ministry of Education (1996–2006).

Member in editorial boards: *Bulletin Math. Soc. Sci. Math. de Roumanie*; *Romanian Journal of Information Science and Technology; Mathematical Reports; Romanian Journal of Pure and Applied Mathematics; Analele Universităţii Bucureşti* (*Matematică*); *Electronic Journal of Graph Theory and Applications; Matematicki Vesnik.*

Membership to professional organizations: American Mathematical Society (since 1989), Romanian Mathematical Society (since 1966).

Honors, prizes:

"Gheorghe Ţiţeica" Prize of the Romanian Academy (1975); Prize for Applied Mathematics, First Balkan Mathematics Competition for Students and Young Researchers, Bucharest (1971); Best PhD Advisor, Abdus Salam School of Mathematical Sciences, GC University Lahore, Pakistan (2009).

Corresponding member of the Romanian Academy (from 2000), member of the International Academy of Mathematical Chemistry (from 2009).

Honorary Citizen of the Ploieşti city (2012)

PhD students: Rozica-Maria Tache (2016), Muhammad Kamran Jamil (2016), Misbah Arshad (2016), Naveed Akhter (2016), Laurenţiu Silviu Vasile (2015), Sana Javed (2013), Ayesha Riasat (2013), Salma Kanwal (2013), Muhammad Imran (2011), Ruxandra Marinescu-Ghemeci (2011), Gabriela Mihai (2011), Syed Ahtsham Ul Haq Bokhary (2010), Mircea Adam (2008), Mohammad Tariq Rahim (2007), Imran Javaid (2007), Akhlaq Ahmad Bhatti (2007), Laura Ciupală (2006), Petrişor Guţă (2003), Hazim A. Farhan (2003), Cristina Vertan (2000), Laurenţiu Modan (1999), Virgil Domocoş (1994), Eugen Mândrescu (1993).

Books:

1. *Problems in Combinatorics and Graph Theory*, John Wiley – Interscience Series in Discrete Mathematics, New York, 1985.

2. *Introduction to Combinatorics*, Ed. Tehnică, Bucharest, 1972 (in Romanian); English version published by Colette's, London and Wellingborough, 1975; Hungarian version published by Muszaki Konyvkiado, Budapest, 1978.

Representative articles:

1. Hypertrees and Bonferroni Inequalities, *J. Combinatorial Theory*, B41 (1986), 209–217.

2. Almost All Digraphs Have a Kernel, *Discrete Mathematics*, 84 (1990), 181–192; reprinted in *Random Graphs* '87, M. Karonski, J. Jaworski, A. Rucinski, eds., J. Wiley, 1990, 325–340.

3. (with M. Zimand) Minimum Spanning Hypertrees, *Discrete Applied Mathematics*, 54 (1994), 67–76.

4. On the Asymptotic Average Length of a Maximum Common Subsequence for Words Over a Finite Alphabet, *Theoretical Computer Science*, 164 (1996), 277–285.

5. (with C.S. Calude) Optimum Extendible Prefix Codes, *Journal of Universal Computer Science*, 3, 11 (1997), 1167–1179.

6. A Threshold Property Concerning Words Containing All Short Factors, *Bulletin of the EATCS*, 64 (1998), 166–170.

7. On Words Containing All Short Subwords, *Theoretical Computer Science,* 197 (1998), 235–240.

8. A Cascade Version of Dantzig's Inductive Algorithm for Matrices Over Semilattice-Ordered Semigroups, *Multiple Valued Logic*, 6, 1–2 (2001), 217–228.

9. On the Number of Occurrences of All Short Factors in Almost All Words, *Theoretical Computer Science*, 290 (2003), 2031–2035.

10. Asymptotic Properties of the Factors of Words Over a Finite Alphabet, *Fundamenta Informaticae,* 64, 1–4 (2005), 463–470.

TRĂUŞAN-MATU, Ştefan

Born on August 26, 1958, in Bucharest, Romania.

Education: 1978–1983, engineer in computer science, "Politehnica" University of Bucharest, Romania.

PhD in computer science, from the "Politehnica" University of Bucharest, 1994. Thesis title: *Computer Aided Software Development. Reverse Engineering for Software Re-Design.* Scientific advisor: Cristian Giumale.

Scholarships, postdoc stages: 2005 – Fulbright postdoc, Drexel University, Philadelphia, PA, USA; 1988–1989, 1990 – scholarships at the International Laboratory for Artificial Intelligence, Slovak Academy of Sciences, Bratislava.

Positions: 2001 – present, Professor (Assoc. Prof. 1997–2001, Lecturer 1994–1997) "Politehnica" University of Bucharest, Computer Science Department; 1999 – present, Scientific Researcher 1st grade (part time), Romanian Academy Institute for Artificial Intelligence; Invited Professor for one month at Universities of Nantes (2003 and 2007), Lyon (2008), Toulouse (2009), and Grenoble (2015) in France; and 6 months in 2005 as a Fulbright scholar, Drexel University, Philadelphia, PA, USA; 1999–2002, Deputy Director, Romanian Academy Institute for Artificial Intelligence; 1994–1999, Head of the Conceptual Modeling Group, Romanian Academy Institute for Artificial Intelligence (RACAI); 1993–1994, Head of Artificial Intelligence Laboratory, Research Institute for Informatics, Bucharest; Applications Programmer (1985–1987), Researcher (1987–1990), Senior Researcher 3rd grade (1990–1993), Research Institute for Informatics, Bucharest; 1983–1985, Applications Programmer, "Microelectronica" Enterprise, Bucharest.

Research areas and results: They are at the confluence of social web, artificial intelligence, discourse analysis, creativity and knowledge construction, education, philosophy, religion, and music.

Pioneer in Romania of the researches in artificial intelligence, computational discourse analysis, object-oriented programming, e-learning, human-computer interaction, constrained-based programming, etc. Creator of scientific schools in Romania in the fields of social discourse analysis with artificial intelligence techniques and ontology-based systems.

The most important professional achievement is the introduction of the polyphonic model of the socially built discourse. This is an original model, recognized and cited as such. It has been used to develop natural language processing tools for analyzing conversations, texts, intertextuality, and creativity. This model was the basis of eight completed doctoral theses.

Administrative positions: Member of CNATDCU (National Council for Titles, Diplomas and Certificates); Member in the Senate of the "Politehnica" University of Bucharest; Member in the Scientific Council of the Romanian Academy Research Institute for Artificial Intelligence; Member in the Faculty Council and in the Council of the Computers Department; Head of the K-Teams Colaborative Knowledge Construction Laboratory in UPB; Deputy director, Romanian Academy Institute for Artificial Intelligence (1994–1999); Head of Artificial Intelligence Laboratory, Research Institute for Informatics, Bucharest 1993–1994).

Editorial boards: *Romanian Journal of Human-Computer Interaction; Annals of the Academy of Romanian Scientists, Series on Science and Technology of Information.*

Membership to professional organizations: Association for Computing Machinery (ACM); IEEE; Founder Member of the Romanian Association for Artificial Intelligence (ARIA); International Society for Learning Sciences (ISLS); Romanian ACM SIGCHI; Romanian Committee for the History and Philosophy of Science of the Romanian Academy (CRIFST); UCMR–ADA (Romanian Musical Performing and Mechanical Rights Society).

Honors, prizes, scientific distinctions, best paper awards: Fulbright Scholar Post-doc, Drexel University, Philadelphia, Pennsylvania, US (2005); Romanian Academy Award "Mihai Drăgănescu" in 2015; Winner of the first prize at the first National Computer Programming Contest, Braşov, Romania (1976); Best paper award at AIMSA 2010; Full member of the Academy of Romanian Scientists.

PhD students: Claudiu Muşat, Costin Chiru, Ştefan Dumitrescu, Vlad Posea (2011), Ana Găinaru, Traian Rebedea (2012), Mihai Dascălu (2013), Dumitru-Clementin Cercel, Abed Alasfour Alnaser (2014), Raghad Jawad Ahmed Al-Shama'a, Mihaela Balint, Larise Stavarache, Sibel Denisleam, Mohammad Allaymoun (2016), Alina-Eugenia Lascu Negulescu, Liviu Sebastian Matei, Marius Gabriel Guțu, Ionuț Cristian Paraschiv (2017).

Books:

1. *Programming in Lisp; Artificial Intelligence and Semantic Web* (in Romanian), Polirom, 2004.
2. *Advanced Human-Computer Interfacing* (in Romanian), Ed. MatrixRom, 2000.

3. (with V. Cristea, O. Udrea) *Intelligent e-Learning Systems* (in Romanian), Politehnica Press, 2005.

4. (with D. Tufiş, D. Marcu, L Negreanu, D. Trifănescu) *Introduction to INTERNET* (in Romanian), Ed. Academiei, Bucureşti, 1997.

5. (with G.G. Constandache, M. Albu, C. Niculescu), *Philosophy and Cognitive Science* (in Romanian), Ed. MatrixRom, 2002.

Representative articles:

1. Is it Possible to Grow an I–Thou Relation with an Artificial Agent? A Dialogistic Perspective, *AI & Society*, Springer, 2017, 1–9.

2. The Influence of Bakhtin's Ideas on Natural Language Processing, e-Learning, and Fostering Creativity, in E. Semenova, ed., *The Problem of Chronotope in Modern Scientific Studies: International Round Table Dedicated to M.M. Bakhtin* (Moscow FSBSI «IAEaCS RAE»), Collection of reports and articles, 2017, 375–384.

3. A Polyphonic Model, Analysis Method and Computer Support Tools for the Analysis of Socially-Built Discourse, *Romanian Journal of Information Science and Technology*, 16, 2–3 (2013), 144–154.

4. (with M. Dascălu, T. Rebedea) PolyCAFe-Automatic Support for the Polyphonic Analysis of CSCL Chats, *International Journal of Computer-Supported Collaborative Learning*, 9, 2 (2014), 127–156.

5. Ethics, a Dialogical Perspective in Artificial Intelligence and Religion (in Romanian), in M. Bălan, V. Mureşan, eds., *Ethics in Science, Religion, and Society* (in Romanian), Editura Universității din Bucureşti, 2015, 185–196.

6. (with Al. Călinescu) Music Composition from Chats' Sonification, According to the Polyphonic Model (in Romanian), *Romanian Journal of Human-Computer Interaction*, 8, 1 (2015), 33–44.

7. Repetition as Artifact Generation in Polyphonic CSCL Chats, *Third International Conference on Emerging Intelligent Data and Web Technologies*, IEEE Conference Publications, 2012, 194–198.

8. Automatic Support for the Analysis of Online Collaborative Learning Chat Conversations, in Ph.M. Tsang, S.K.S. Cheung, V.S.K. Lee, R. Huang, eds., *Hybrid Learning, Third International Conference, ICHL 2010*, Beijing, *LNCS* 6248, Springer, 2010, 383–394 (Invited talk).

9. A Socio-Cultural Ontology for Urban Development, in J. Teller, J. Lee, C. Roussey, eds., *Ontologies for Urban Development, Studies in Computational Intelligence*, vol. 61, Springer, Berlin, 2007, 121–130.

10. (with G. Stahl, J. Sarmiento) Supporting Polyphonic Collaborative Learning, *E-Service Journal*, 6, 1 (2007), 58–74.

Further information: Invited speaker in USA, China, Germany, France, San Marino, Puerto Rico, Croatia, etc. Member or president of many Steering, Organizations and Program Committees of conferences, workshops and summer schools in Romania and abroad; Program Chair of Intelligent Tutoring Systems Conference, Honolulu, Hawaii, US (2014).

Authored or edited 23 books, authored 40 book chapters, and more than 400 peer-reviewed papers.

Conducted many European and national funded projects.

Development of software systems: *ReaderBench* – Software framework supporting students and tutors in text analysis by natural language processing and social network analysis tools based on the polyphonic model; *PolyCAFe* – Environment for the Natural Language Processing of collaborative problem solving chats; *Polyphony* – Environment for collaborative problem solving chats; *SINTEC* – Intelligent Tutoring System based on ontologies and XML annotations standards for learning objects; *STyLe* – System for assisting the learning of a foreign language in a technical domain, *PEKADS* – Operationalization of the KADS knowledge acquisition methodology using description logics; *PAIL* – Portable Artificial Intelligence Lab, Intelligent reverse engineering; *COPE* – A flexible constraint processing module for object–oriented programming; *XRL* – Environment for developing knowledge-based systems; *Vectori, Prompt* – programs for computer aided design of integrated circuits layouts.

Personal web pages:
https://cs.pub.ro/index.php/people/userprofile/stefan_trausan;
http://www.racai.ro/trausan

ȚÂMBULEA, Leon

Born on November 17, 1949, in Feldru, Bistrița-Năsăud county, Romania.

Education: 1967–1972: Faculty of Mathematics and Mechanics, "Babeş-Bolyai" University of Cluj-Napoca, Section Computer Science.

PhD: Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University, 1985. Thesis title: *Mathematical Models of Organization of the Information Structures.* Scientific advisor: Stancu D. Dimitrie.

Positions: Teaching Assistant (1972–1991), Lecturer (1991–1992), Associate Professor (1992–1995), Professor (1995–2015), Department of Computer Science, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University of Cluj-Napoca.

Research areas: Databases, computer graphics.

Main results:

In many papers we propose solutions for minimizing data transfers in distributed data bases using new replica creation or rearranging fragments. Data transfer is the principal factor when transferring intermediate results in the process of query evaluation. The proposed methods and algorithms uses information about the database layout, its structure, query execution, and database statistics.

We propose new methods and algorithms for determining the processing nodes for the evaluation of each relational operator of a query so that data transfer is minimal.

In many papers we solve the following problem: online reallocation or rearranging of the fragments in order to constantly optimize the query response time (minimizes the size of the data transferred between the network nodes). We model our solutions as a mathematical linear programming problem or as the maximum compatible cost flow in a transport network.

There are experimental numerical results used to compare improvements between different database configurations, before and after optimization.

Lately, new apps are running that handle large collections of mobile objects. In order to query and update the position of these objects, several index structures are used. Each of these structures has its own advantages in solving a concrete problem. The POI (Point of Interest) term is used in the context of using mobile

devices. A feature of object collections with POIs is their relatively static character (these objects usually do not change their location). In the recommended index structures for these collections, a POI object is stored once. We suggested modifying an existing index structure by storing POIs several times. The purpose of this multiple storage is to reduce the response time for queries within the range.

A generalized cylinder is an object bounded by a surface generated by moving a 2D contour curve along a 3D spine curve, possibly scaling the contour along the spine, and two end planes. We have obtained some interesting properties of these objects. We have studied the conditions to avoid local and global self-intersection of generalized cylinders. We have analyzed some of their integral properties, such as surface and volume.

A Bezier curve (or surface) is defined by using the Bernstein basis and a set of points, so its shape depends only on the point positions. We generalized the Bernstein basis in order to obtain more flexible curve and surfaces corresponding to a set of fixed points.

Administrative positions:

1992–1993: Director, "Babeş-Bolyai" University Computing Center.

1992–1996: Vice-dean, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University.

1996–2000, 2000–2004, 2007–2012: Dean, Faculty of Mathematics and Computer Science, "Babeş-Bolyai" University.

1996–2000, 2000–2004, 2004–2007: Head of the chair, Faculty of Mathematics and Computer Science, Chair of Computer Systems.

Editorial boards:

Studia Universitatis "Babeş-Bolyai", Series Mathematica (1996–2000; editor-in-chief); *Studia Universitatis "Babeş-Bolyai", Series Informatica* (2000–2018).

Membership to professional organizations: ACM; Computer Science Commission, Romanian National Council for Academic Titles (CNATDCU), 2000–2003, 2006–2011.

Honors, prizes:

Teaching Assistant Highlighted, Ministry of Education, 1987.

Diploma of Merit, "Babeş-Bolyai" University (2003, 2007, 2008, 2011).

PhD students: Dumitru Rădoiu (2000), Maria Trîmbiţas (2003), Ileana Moga (2003), Adrian Sergiu Darabănţ (2004), Mădălina Moldovan (2004), Horea Todoran (2005), Radu-Lucian Lupşa (2005), Adrian Oneţ (2005), Alina Câmpan (2006), Laura Szakacs (2007), Andreea Navroschi-Szasz (2007), Mihai Constantin Avornicului (2009), Manuela Horvat (married Petrescu; 2010), Sabina Surdu (2012), Vasile Cătălin Rusu (2012).

Books:

1. (with Fl. Boian, I. Lazăr) *Informatica de bază*, Presa Universitară Clujeană, Cluj-Napoca, 2005.
2. *Baze de date*, Presa Universitară Clujeană, Cluj-Napoca, 2003.

Representative articles:

1. (with A.S. Darabănţ, V. Varga) Access Patterns Optimization in Distributed Databases Using Data Reallocation, *International Conference on Database and Expert Systems Applications (DEXA)*, Lyon, France, 2017, 178–186.
2. (with A.S. Darabănţ, V. Varga) A Linear Approach to Distributed Database Optimization Using Data Reallocation, *25th International Conference on Software, Telecommunications and Computer Networks (SoftCOM)*, 2017, 1–6.
3. (with A.S. Darabănţ, V. Varga) Data Transfer Optimization in Distributed Database Query Processing, *Studia Univ. "Babeş-Bolyai", Informatica*, LIX, 1 (2014), 71–82.
4. (with A.S. Darabănţ, A. Navroschi-Szasz) Redundant Spatial Index for Solving Range Queries, *Studia Univ. "Babeş-Bolyai", Informatica*, LVII, 4 (2012), 75–84.
5. (with M. Horvat) Redistributing Fragments into a Distributed Database, *Int. J. of Computers, Communications and Control*, 3 (2008), Suppl. issue: *Proc. ICCCC*, 2008, 11–16.
6. (with M. Horvat) Dynamic Distribution Model in Distributed Database, *Int. J. of Computers, Communications Control*, III (2008), Suppl. issue: *Proc. ICCCC*, 2008, 512–515.
7. (with I. Gânscă, W.F. Bronsvoort, G. Coman) Self-Intersection Avoidance and Integral Properties of Generalized Cylinders, *Computer Aided Geometric Design*, 19 (2002), 695–707.
8. (with I. Gânscă, Gh. Coman) Generalizations of Bezier Curves and Surfaces, in *Curves and Surfaces in Geometric Desig*, P.J. Laurent, A. Mehaute, L.L. Shumaker, Eds, A K Peters, Wellesley MA, 1994, 169–176.
9. Binary Trees, an Euler's Problem and Finite Sequences of Numbers, *Studia "Babeş-Bolyai", Mathematica*, XXXV, 3 (1990), 83–94.
10. (with Z. Kasa) Binary Trees and Number of States in Buddy Systems, *Annales Universitatis Scientirum Budapestinensis de Roland Eötvös Nominate, Sectio Computatorica*, VII (1987).

ȚIPLEA, Ferucio Laurențiu

Born on October 4, 1962, in Bârlad, Vaslui county, Romania.

Education: Faculty of Mathematics, computer science specialization, "Al.I. Cuza" University of Iaşi, Romania (1982–1986).

PhD: "Al.I. Cuza" University of Iaşi, 1993. Thesis title: *Contributions to the Petri Net Language Theory.* Scientific advisor: Calin Ignat.

Positions:

Visiting Professor, LACL, University Paris 12 Val de Marne, Créteil, France, September 2008.

Visiting Professor, School of Computer Science, University of Central Florida, Florida, USA, December 2003 – December 2006.

Visiting Scientist, Department of Computer Science, Carnegie Mellon University, Pittsburg, Pennsylvania, USA, October 1 – November 30, 2001.

Research areas: Petri nets and cryptography (including security protocols).

Main results:

Petri nets:

a. Developed extensions of Petri nets, such as conditional, selective, and jumping Petri nets. These extensions increase gradually the expressive power, and offer many advantages in modeling and analyzing real distributed systems. Particularly, jumping Petri nets offer abstraction facilities, being very suitable for modeling reactive systems.

b. Developed replacement techniques for Petri nets that allow validation and verification of system properties.

c. Developed verification techniques for Petri nets and workflow nets based on fragments of the computational tree logic CTL* and on linear time mu-calculus.

d. Developed many results on soudness of workflow nets, such as: decidability of structural soundness (problem formulated in 1998), alternative proof for the decidability of generalized soundness, complexity results for the soundness of many subclasses of workflow nets as well as extensions of workflow nets.

Cryptography and security protocols:

a. Developed complexity results for security protocols, as well as an epistemic logic formalism for reasoning about anonymity in security protocols.

b. Introduced compact sequences of co-primes and proved that they are the necessary and sufficient condition for assymtotic idealness of CRT-based secret sharing schemes.

c. Developed attribute-based encryption schemes based on secret sharing and bilinear/multilinear maps.

d. Developed probability distribution results on quadratic residues and non-residues in sets of the form $a+X$, where X is a subset of integers, clarifying several aspects regarding identity-based encryption schemes based on the quadratic residuosity problem.

Administrative positions: Director of the Master Program "Information Security", "Al.I. Cuza" University of Iaşi, Department of Computer Science.

Honors, prizes, scientific distinctions:

Diploma of Excellence in Research for 2016, "Al.I. Cuza" University of Iaşi.

Fulbright fellow, Department of Computer Science, Carnegie Mellon University, Pittsburg, Pennsylvania, USA, January 15 – April 14, 2001.

German Academy fellow, Institut für Informatik, Universität Augsburg, Germany, September 20, 1999 – March 20, 2000.

DAAD Fellow, Institut für Informatik, Universität Eichstadt, Germany, June 30 – August 30, 1999.

Monbusho Fellow, Department of Computer Science, Kyoto Sangyo University, Japan, October 1995 – March 1997.

DAAD Fellow, Institute für Informatik, Universität Freiburg, Germany, May 1 – July 31, 1995.

PhD students: Sorin Iftene (2007), Cătălin Birjoveanu (2007), Geanina Macovei (2008), Constantin Enea (2008), Gabriela Mogoş (2010), Corina Dima (2013), Cosmin Varlan (2013), Cătălin Drăgan (2013), Iulian Goriac (2015).

Books:

1. *Algebraic Foundations of Computer Science*, Editura Polirom, 2006 (xiii + 581 pages).

2. (with T. Jucan) *Petri Nets. Theory and Application*, Romania Academy Publishing House, Bucharest, 1999 (x + 238 pages).

3. *Introduction to Set Theory*, "Al.I. Cuza" University Publishing House, Iaşi, 1998 (xiv + 306 pages).

Representative articles:

1. (with C.C. Drăgan) Distributive Weighted Threshold Secret Sharing Schemes, *Inf. Sci.*, 339 (2016), 85–97.

2. (with C.C. Drăgan) A Necessary and Sufficient Condition for the Asymptotic Idealness of the GRS Threshold Secret Sharing Scheme, *Inf. Process. Lett.*, 114, 6 (2014), 299–303.

3. (with C.C. Drăgan) Key-Policy Attribute-Based Encryption for Boolean Circuits from Bilinear Maps, *BalkanCryptSec*, 2014, 175–193.

4. (with C. Enea, C.V. Birjoveanu) Decidability and Complexity Results for Security Protocols, *VISSAS*, 2005,185–211.

5. (with L. Vamanu, C. Vârlan) Reasoning About Minimal Anonymity in Security Protocols, *Future Generation Comp. Syst*., 29, 3 (2013), 828–842.

6. (with I. Leahu) The Reversible Released Form of Petri Nets and Its Applications to Soundness of Workflow Nets, *IEEE Trans. Systems, Man, and Cybernetics: Systems*, 46, 2 (2016), 303–312.

7. (with C. Bocăneală) Priority Workflow Nets, *IEEE Trans. Systems, Man, and Cybernetics: Systems*, 43, 2 (2013), 402–415.

8. (with C. Bocăneală, R. Chiroşca) On the Complexity of Deciding Soundness of Acyclic Workflow Nets, *IEEE Trans. Systems, Man, and Cybernetics: Systems*, 45, 9 (2015), 1292–1298.

9. (with G.I. Macovei) Soundness for S- and A-Timed Workflow Nets Is Undecidable, *IEEE Trans. Systems, Man, and Cybernetics*, Part A, 39, 4 (2009), 924–932.

10. (with A. Țiplea) Petri Net Reactive Modules, *Theor. Comput. Sci.*, 359, 1–3 (2006), 77–100.

Personal web page: https://profs.info.uaic.ro/~fltiplea/

ȚUȚU, Ionuț

Born on June 16, 1987, in Bucharest, Romania.

Education:

BSc in computer science (2005–2008) and MSc in theoretical computer science (2008–2010), Faculty of Mathematics and Computer Science, University of Bucharest, Romania.

MSc in logic and formal specifications (2009–2011), Department of Mathematics, "Şcoala Normală Superioară" Bucureşti, Romania.

PhD in computer science, Royal Holloway University of London, United Kingdom, 2015. Thesis title: *Institution-Independent Logic Programming*. Scientific advisor: José Luiz Fiadeiro.

Scholarships, postdoc stages: EPSRC Doctoral Training Grant, University of Leicester, United Kingdom (2011); Reid Scholarship, Royal Holloway University of London, United Kingdom (2012–2014).

Positions:

Research Assistant, Institute of Mathematics of the Romanian Academy, Romania, 2012–2014.

Teaching Assistant, Workshop Leader, Royal Holloway University of London, United Kingdom, 2013–2017.

Teaching Fellow, Research Associate, Royal Holloway University of London, United Kingdom, 2017–2018.

Research areas: Logic-independent logic programming, algebraic specification, formal software development, abstract model theory.

Main results:

A general theory and isomorphism theorem for the simultaneous and the sequential instantiation of parameterized specifications.

An abstract model-theoretic framework for developing and conducting research into logic programming over arbitrary logical systems.

Representative articles:

1. (with J.L. Fiadeiro) From Conventional to Institution-Independent Logic Programming, *Journal of Logic and Computation*, 27, 6 (2017), 1679–1716.

2. (with J.L. Fiadeiro) Revisiting the Institutional Approach to Herbrand's Theorem, *Algebra and Coalgebra in Computer Science*, lipics 35, 304–319, Schloss Dagstuhl, 2015

3. (with J.L. Fiadeiro) Service-Oriented Logic Programming, *Logical Methods in Computer Science*, 11, 3 (2015).

4. (with R. Diaconescu) Foundations for Structuring Behavioural Specifications, *Journal of Logical and Algebraic Methods in Programming*, 83, 3–4 (2014), 319–338.

5. Parameterisation for Abstract Structured Specifications, *Theoretical Computer Science*, 517 (2014), 102–142.

6. Comorphisms of Structured Institutions, *Information Processing Letters*, 113, 22–24 (2013), 894–900.

7. (with R. Diaconescu) On the Algebra of Structured Specifications, *Theoretical Computer Science*, 412, 28 (2011), 3145–3174.

VAIDA, Dragoş Alexandru

Born on June 1, 1933, in Constanţa, Romania.

Education: Faculty of Mathematics and Physics, now Mathematics and Informatics, University of Bucharest, BSc (Honours) 1957, supervisor prof. Gr.C. Moisil, work reported in "Un problème de G. Birkhoff", *Comptes Rendus Acad. Bulg. Sci.*, 15 (1962), 801–803.

PhD in mathematics at "M.V. Lomonosov" Moscow State University, 1964. Thesis title: *Some Results on Partially Ordered Algebraic Systems*. Scientific advisor: Alexandr Ghenadievici Kuroş.

Scholarships, postdoc stages: UN Orientation Course Civil Service, Ottawa (1965); Nippon Electric Company Course (1968).

Positions: Researcher, speciality "mathematician for computers programming" at the Institute for Atomic Physics (IFA) of the Romanian Academy (1957–1966). Assistant Professor, Lecturer at the University for Civil Engineering a. o. (1959–1966). Deputy Scientific Director, Researcher, Lecturer at the Computing Center for Economic Computation and Economic Cybernetics of the Academy of Economic Sciences (ASE) Bucharest (September 1966–1970). Associate Professor at the University of Bucharest (June 1970–1992). Professor at the University of Bucharest (1992–2003). Visiting Professor at the Department of Mathematics of the University of Bologna (1991 and 1992). Invited Professor at École Normale Supérieure de Cachan (Certificat d'instalation 1993 January–March). Guest Professor at Duke University (one academic year 1975–1976). Visiting Professor at the Computer Science Departments of University of Trento, Acquila (different periods each of three months). Guest Professor at the Universities of Oxford, Pisa, Genova, Milano. Visiting Researcher in different institutes including Polytechnics INESC Lisabona.

Courses on mathematics, computers programming and languages, compiling techniques, software implementation, structures related to fuzzy logic approach in modelling (with M. Fedrizzi, A.G.S. Ventre, 1996, 1997), on semirings theory and applications for Master studies.

Research areas (constant mathematical orientation): Formal and programming languages and applications to compiling techniques and semantics, algebraic

fundamentals of theoretical computer science, partially and multilattice ordered structures, partially ordered partial semirings-like systems, rings. History and philosophy of mathematics and computer science.

Main results: First books in Romanian on programming (1961) and applying formal languages and algebra to the theory of programming languages (1973, 1976).

Initiating the study of some partially ordered monoids, groups or semirings beyond lattice ordering (see McAlister, On Multilattice Groups, *Proc. Cambridge Philos. Soc.*, 61 (1965), 621–638). Vaida's method in approximation process (see H. Gonska, Habilitationsschrift, Duisburg University, 1985). Two chapters in *Discrete Mathematics and Computer Science. In Memoriam Alexandru Mateescu (1952–2005)* (Gh. Păun, G. Rozenberg, A. Salomaa, eds.), The Publ. House of the Romanian Academy, Bucharest, 2014, 241–258 (with R. Nicolescu), 285–300 on semirings.

Following priorities in Romanian literature reported: programmes for abstract algebra computations (*St. Cercet. Mat.*, X, 2 (1959), 447–458), computers programmes for applications in economy (*Com. Acad. RPR*, X (1961), 1147–1149), numerical methods and programming techniques in economic informatics (*Proc. 5e Congrès Internat. de Cyb*., Namur, Belgique, 1968, 433–447), automatic programming-interpreting routines (*Buc. Inst. Fiz. At.,* MC–6, 1964). Definition and compiler for the algorithmic language ALGAMS (Algorithmic Language for Medium Computers) in the international group GAMS headed by A. Mazurkiewicz (Poland) and acad. Bl. Sendov (Bulgaria) (*Buc. Inst. Fiz. At. al Acad. RSR*), The algorithmic language elaborated by GAMS (*Aut. Elec.*, 10, 3 (1966), 133–136).

Ordered structures for visual data: An Algebraic-Oriented Approach to Visual Interaction, 2000 (with P. Bottoni and S. Levialdi). Fuzzy and Visual Languages and Applications to Spatial Reasoning; Relational Paths Algebra for Distances and Directions for Artificial Intelligence (with Eph.P. Glinert and J.A.P. Jorge).

Administrative positions: Scientific secretary at the Ministry of Education (1971). Honorary scientific secretary of the Commission for Cybernetics of the Academy (1971–1973). Deputy general director at the Ministry of Education (February 1972–1973). Deputy director at the UNESCO European Center for Higher Education CEPES (1973–1979).

Editorial boards: *Economic Computations and Economic Cybernetics* (ASE); *Paedagogica Europaea; Analele Universităţii Bucureşti, Matematică –Informatică.*

Member of professional organizations: Romanian Society for Informatics (founding member).

Awards: "Grigore C. Moisil" Prize of the Romanian Academy, 2006.

Graduate students: Referee and close collaboration on PhD with Al. Mateescu, R. Nicolescu, T. Bălănescu.

Books:

1. *Utilizări ale calculatoarelor electronice de la IFA* (*Using Electronic Computers at IFA*), Editura Academiei Române, Bucureşti, 1961 (50 pages; in Romanian).

2. *Programarea calculatoarelor electronice* (*The Programming of Electronic Computers*), Editura Academiei Române, Bucureşti, 1967 (384 pages; in Romanian).

3. *Algoritmi de compilare* (*Compiling Algorithms*), Editura de Stat şi Didactică Pedagogică, Bucureşti, 1971 (213 pages; in Romanian).

4. *Limbaje formale şi tehnici de compilare* (*Formal Languages and Compiling Algorithms*), Universitatea Bucureşti, 1976 (150 pages; in Romanian).

5. (with Al. Mateescu) *Structuri matematice discrete. Aplicații* (*Discrete Mathematical Structures. Applications*), Editura Academiei Române, Bucureşti, 1989 (214 pages; in Romanian, with a preface by acad. Solomon Marcus).

Representative articles:

1. An Extention of a Y.C. Yang Theorem, *Soft Comput.*, 21 (2017), 2507–2512.

2. On Some Order Properties Related to Processes Semantics (I), *Fundam. Inform.*, 73, 1–2 (2006), 307–319.

3. (with S. Rudeanu) Semirings in Operations Research and Computer Science: More Algebra, *Fundam. Inform.*, 61, 1 (2004), 61–85.

4. On Partially Additive Semirings and Applications, *Journal of Multiple-Valued Logics*, 6 (2001), 251–256.

5. Notes on Partially-Ordered Structures in Computer Science: 1. PA-Ordered Semirings and Some Related Structures, *J. UCS*, 6, 1 (2000), 201–211.

6. (with J.S. Golan, Al. Mateescu) Semirings and Parallel Composition of Processes, *Journal of Automata, Languages and Combinatorics*, 1, 3 (1996), 199–218.

7. Iteration Conditions of W. Ogden's Type and Applications to Programming Languages (II), *Developments in Language Theory. At the Crossroads of Mathematics, Computer Science and Biology* (*Proc. Conf. on Developments in Language Theory*, 1993), G. Rozenberg, A. Salomaa, eds., World Scientific, Singapore, 1994, 44–50.

8. (with C.S. Calude) Ehrenfeucht Test Set Theorem and Hilbert Basis Theorem: A Constructive Glimpse, *MFCS* 1989, *LNCS*, 379, Springer, 1989, 177–184.

9. Groupes ordonnés dont les éléments admettent une décomposition jordanienne généralisée, *C.R. Acad. Sci. Paris,* 257 (1963), 2053–2055, *C.R. Acad. Sci. Paris,* 257 (1963), 2222–2223, and *Buc. Institut. Phys. At.*, EC/2, 1963, and *Rév. Roum. Math. Pures et Appl.*, 10, 10 (1964), 929–948.

10. (with D. Barbălat) Le cas limite du critère de Wittmeyer pour la méthode de Gauss–Seidel, *Bull. Math. Sci. Math. Phys. Roumanie*, 4(52), 3–4 (1960) 3–18; *C. R. Acad. Sci. Paris*, 255 (1962), 235–237.

Further information:

Cited by G. Birkhoff, L. Fuchs, A. Bigard, S. Drossopopoulou, J.S. Golan, H.J. Weinert, U. Hebisch, M.E. Anderson, T.H. Feil, S. Bistarelli, F. Gadducci, P. Bottoni, W. Brauer, U. Montanari, I. P. Cabrera, M. Ojeda–Aciego, C. Calude, H. Jürgensen, R.O. Canham, S.L. Smith, A.M. Tyrrell, E. Clementini, P.D. Felice, M.R. Darnel, P.B. Fellgett, N.D. Filipov, A.A. Vinogradov, R.V. Gamkrelidze, B.J. Gardner, M.M. Parmenter, K. Glazek, T. Harju, J. Jakubìk, M. Kudlek, M. Kudlek, W. Kuich, G. Rozenberg, A. Salomaa, S. Zhao, X. Wang, etc.

Programmes set for testing ALGOL compiler, including Knuth Remaining trouble spots, on English Electric System, International Comp. Limited (1968) in EEC – ICL preprint (1968). Joint articles with colleagues from Italy, Portugal, USA.

Invited section chairman IFIP 2nd World Conference Computer Education (1975) a.o. conferences invited papers.

Solomon Marcus, "Gr.C. Moisil: A Life Becoming a Myth" (*Int. Jour. Computers, Comm. & Control*, I, 1 (2006), 73–79) writes: "The first Romanian team of mathematicians included Dragoş Vaida, I. Moldovanu, Gh. Zamfirescu, G. Klarsfeld. So, we can say that 1957 is the date of birth of Romanian Computer Science, under the guidance of Professor Moisil and by the collaboration between engineers and mathematicians."

VĂDUVA, Ion

Born on November 25, 1936, in Oteşani, Vâlcea county, Romania.

Education: Graduated in mathematics at the University of Bucharest, 1960; MSc in computing at the University of Manchester (UK), Institute of Science and Technology (UMIST), 1969.

PhD at the Center of Mathematical Statistics of the Romanian Academy, 1968. Thesis title: *Contributions to the Estimations of Probability Density Functions and Their Applications.* Scientific advisor: Gheorghe Mihoc.

Scholarships: UMIST, Dept. of Computation, Oct.1968–Aug. 1969 (obtained M.Sc. degree); GMD Bonn (Germany), May 1974 – August 1974; Univ. of Sheffield (UK), Nov – Dec. 1992; Technische Hochschule (TH) Darmstadt, July – October 1993.

Positions: Researcher at the Institute of Mathematics of the Romanian Academy (1960–1964).

Research Worker (1964–1968), Principal Researcher (1968–1969), Head of Cector (1969–1970) at the Center of Mathematical Statistics (CSM) of the Romanian Academy.

Associate Professor (1970–1991), Professor (1991–2007, when retired), Faculty of Mathematics, Bucharest University.

Research areas:

Multivariate statistical quality control, analysis of variance, stochastic simulation and Monte Carlo methods (main result: computer generation of random variables, for queueing systems, illustrated by a machine interference problem), simulation of various statistical distributions, simulation of some discrete stochastic processes, mathematical statistics and applications, applications of simulation in queueing theory and reliability, various mathematical models, including reliability models and software reliability, multiple attribute decision models, developing stochastic and fuzzy models.

Administrative positions:

Director of the Computing Center of the University of Bucharest (CCUB) from 1970 to 1993. CCUB developed several practical projects for users from industry or economics. (The activity was self-funded.)

Coordinated implementation of two discrete simulation languages on the Rumanian third generation computers FELIX C–256, namely; SIMUB (SIMulation language of the University of Bucharest) and GASP–SIMPATIC which involved a team consisting of Maria Lovin, Matei Bogdan, and Dorin Panaite from CCUB and lecturers Octavian Bâscă, Adrian Atanasiu, and Nicolae Ţăndăreanu from the Faculty of Mathematics; students were also involved).

Coordinated applied research to develop a computer package for geostatistics (Mircea Adam, Emil Perjeriu, Ioan Roşca), a statistical package for testing the quality of drugs (Denis Enăchescu, Mihai Cherciu, Doina Gheorghe, Poliana Ştefănescu).

A group of researchers from CCUB developed a project PLUB (Programming Language of the University of Bucharest) designing a programming methodology for software technology (L. Sofonea, Radu Niculescu, Tudor Bălănescu, Marian Gheorghe).

The staff of CCUB assured the practical lectures for the students in the faculties of the Bucharest University, mainly for students in mathematics. CCUB, with the high contribution of acad. N. Teodorescu also developed cooperation with UNESCO: organized nine annual editions (in English) of the international course "Informatics and applied mathematics for research", for students from developing countries and from Romania.

In 1971–72 I was appointed adviser in the Ministry of Education in charge with problems of developing curricula in computer science. Together with Dragoş Vaida we designed a curriculum for bachelor studies in informatics. Even if the Council of the Faculty of Mathematics of Bucharest University rejected the project, the minister Mircea Maliţa approved specializations in informatics in the faculties of mathematics within universities such as Bucharest, Iaşi, Cluj-Napoca, Timişoara, and Craiova. Today, such specializations exist in about all universities of Romania.

Mmember of the Faculty Council for more than 30 years, after 1971. Member of the Senate of the University (1990–2004). Vice-dean of the faculty (2000–2004).

Editorial Boards: *Statistics* (journal of Berlin Academy; 1976–1992); *Annals of Bucharest University* (1980 – present); *Revista de informatică economică* (ASE, Bucharest; 1985–2007); *Revista română de informatică* (ICI; 1987–2005).

Memberships to professional organizations:

International Association for Statistical Computing (1988–present); American Mathematical Society (1992–present); Societatea de Probabilităţi şi Statistică din Romania (1990 – present); Romanian Econometric Society (honorary president; since 2015).

Honors, awards: "Simion Stoilow" Prize of the Romanian Academy, 1977; Doctor honoris causa of the University of Craiova, 2015.

PhD students: Started supervision in 1971, finalized theses of 23 foreigners and 40 Romanians in the field of computer science or applied mathematics.

Some examples of Romanian PhD students: Nicolae Popoviciu, Ileana Popescu, Denis Enăchescu, Marin Popa, Florentina Hristea, Marius Popescu, Florentina Suter, Marina Cidota, Letiția Velcescu, Marin Vlada, Carmen Bobeanu, Liliana Spircu, Radu Şerban, Gheorghe Ciobanu, Benone Săvulescu, Aida Toma, Luiza Badin, Romică Trandafir, Ion Mierluş-Mazilu, Daniel Ciuiu, Iuliana Iatan, Gheorghe Barbu, Maria Miroiu, Gheorghe Petrescu, Dumitru David, Ion Iancu, Nicolae Constantinescu, Mihai Giurcă, Mihai Gabroveanu, Gheorghe Turcitu, Marinoiu Cristian, Lixandroiu Dorin, Ion-Lilian Florea, Doina Petroniu, Carmen Lupu, Victor Pescaru, Anca Dumitrescu, Rolanda Predescu. Most of them are occupying high positions in various universities and research institutes from Romania.

Books:

1. *Analiza dispersională,* Ed. Tehnică, Bucureşti, 1970 (260 pages).
2. *Modele de simulare cu calculatorul*, Ed. Tehnică, Bucureşti, 1977 (358 pages).
3. (with I. Ogădescu, M. Stoica) *Simularea proceselor economice*, Ed. Tehnică, 1983 (264 pages).
4. (with Gr. Albeanu) *Introducere în modelarea fuzzy*, Ed. Univ. Buc., 2004 (160 pages).
5. *Fiabilitatea şi calitatea produselor IT*, Ed. Matrix, Bucureşti, 217 (216 pages).

Representative articles:

1. (with R. Theodorescu) Statistische Qualitatskontrolle bei Mehrer Gleichzeitigen Merkmahlen, ein Analogon für Kalibermethode mit Verengten Grenzen, *Mathematik u. Wirtschaft,* 1966, 150–175.
2. On a Mathematical Model, Concerning the Endemy of Tuberculosis, *Abn. Deutsche Akad. Wiss*., *Math. Phys. Tech.*, 1968, 183–188.
3. Computer Generation of Gamma Random Variables by Rejection and Composition Procedures, *Math. Oper. Forsch. U. Statistik, Ser. Statist*., 8, 4 (1977), 545–576.
4. Computer Generation of Random Vectors Based on Transformation of Uniform Distributed Vectors, *Proc. Seventh Int. Conf, Prob. Theory, Braşov*, 29 Aug. – 5 Sept., 1982, 589–597.
5. (with I. Popescu) An Optimum Plan of Reliability Control, *Computing*, 44 (1990), 158–168.
6. Simulation of Systems Reliability, *Proc. IEPM'99, International Conference on Industrial Engineering and Production Management*, Glasgow, July 12–15, 1999, Book 1, 201–210.
7. Statistical Simulation and Numerical Procedures, *Encyclopedia of Life Support Systems* (EOLSS), EOLSS Publishers UNESCO, Oxford, 2003 (33 pages).

8. Simulation of Some Mixed Lifetime Distributions, *Ann. Univ. Bucureşti, Ser. Informatica*, 2011, 10–19.

9. On Solving Some Types of MADM Problems, *Romanian J. of Economic Forecasting*, 15, 2 (2012), 41–61.

10. Computing Center of the University of Bucharest, an Important Step in the Hystory of Computer Science in Romania, *Proc. 9th Conference on Virtual Learning*, M. Vlada, Gr. Albeanu, D.M. Popovici, eds., Oct. 24–25, Bucharest, 2014, 23–31.

Further information:

Published 22 books and textbooks related to stochastic simulations, programming languages, information systems, and computer applications, and a total of 122 papers.

Personal web page: www.fmi.unibuc.ro/departamente/profesoriconsultanti/vaduvaion.

VERLAN, Sergey

Born on August 13, 1978, in Chişinău, Republic of Moldova.

Education:
2000: Master in applied mathematics, State University of Moldova, Chişinău, Moldova.
2001: Master in computer science, University of Metz, France.

PhD: University of Metz, France, 2004. Thesis title: *Head Systems and Applications to Bioinformatics*. Scientific advisor: Maurice Margenstern.
Habilitation thesis: University of Paris Est, 2010, *Study of Language-Theoretic Computational Paradigms Inspired by Biology.*

Positions:
From 2005: Associate Professor, Department of Computer Science, University of Paris Est Créteil Val de Marne.
2004–2005: Temporary Lecturer at IUT of Metz, France.
1997–2000: Laboratory Assistant at the Institute of Mathematics and Computer Science of the Academy of Sciences of Moldova.

Research areas: Natural computing, DNA computing, formal language theory, membrane computing, insertion-deletion systems

Main results:
One of the main interests is the search for universal devices (of small size) in the framework of different bio-inspired computational models. I have a comprehensive record of computational completeness and universality results in the areas of splicing systems, insertion-deletion systems and membrane computing. Another line of research interests concerns the investigation of links between different computing models and the transfer of concepts and ideas from one model to another.

In the area of DNA computing the most important effort was concentrated on splicing-based models. I have more than 15 results constructing small universal or computationally complete devices for various models based on splicing. Among the most important: computational completeness of splicing test tube systems with 2 tubes, of time-varying distributed H systems with 1 component (corresponding to the fixed-point iteration of the splicing operation), and universality of splicing P systems with 5 rules (which is one of the smallest universal devices ever built).

Another important topic of interest concerns insertion-deletion systems, a model having linguistic, biological, and formal language inspirations. The corresponding operations allow inserting or erasing a substring in a specified context. I have shown more than 20 universal constructions exhibiting small descriptional complexity parameters; in most of the cases the results being optimal. A particular result should be highlighted – the computational completeness of context-free insertion-deletion systems. This result, lying at the foundations of theoretical computer science, shows that the highest computational power can be achieved by only inserting and deleting strings of size at most 3 in a context-free manner. This result was further completed by me: using strings of size 2 yields to a particular subclass of context-free languages, thus completely describing the class of context-free insertion-deletion. Another important result in this area concerns controlled insertion-deletion and systems with asymmetrical contexts (both introduced by me) as well as the study of leftist insertion-deletion systems (inserting or deleting one symbol in some left context) showing the equivalence of finite and regular contexts, thus bridging this area to the field of restarting automata.

In the area of membrane computing I was concentrated on the computational completeness and universality results for small systems, yielding several dozens of such constructions. I mention the computational completeness of the basic model of P systems with 23 rules (corresponding to the pure multiset rewriting), symport-antiport tissue P systems with 2 cells, and the smallest universal P system (based on splicing) – having only 5 rules.

Other directions in membrane computing include a comprehensive study of generalized communicating P systems (where a rule corresponds to a synchronous movement of two single objects in a graph structure), yielding several universality and decidability results, as well as numerous links to Petri nets and concurrent modelling.

Another interesting direction is the formal framework for membrane computing that allows to construct membrane computing models with different properties, allowing to investigate the relationship between different variants of membrane systems (e.g., bisimulations), as well as to compare membrane computing models with other related models like Petri nets or multiset rewriting.

Administrative positions: Responsible for the bachelor program in computer science at the University of Paris Est Créteil, from 2007.

Editorial boards: *Journal of Membrane Computing.*

PhD students: Alexander Krassovitskiy (2011), Sergiu Ivanov (2015), Zeyi Shang (started in 2017), Juan Quiros (2012, external tutor).

Representative articles:

1. (with M. Margenstern, Y. Rogozhin) Time-Varying Distributed H Systems with Parallel Computations: The Problem is Solved, *Proc. DNA Computing: 9th International Workshop on DNA Based Computers*, DNA9, Madison, WI, USA, June 1–3, 2003, *Revised Papers, LNCS* 2943, Springer, 2004, 48–53.

2. (with Y. Rogozhin) Computational Models Based on Splicing, Automata, Universality, Computation, *Emergence, Complexity and Computation*, 12 (2015), 237–258.

3. (with M. Margenstern, Gh. Păun, Y. Rogozhin) Context-Free Insertion-Deletion Systems, *Theoretical Computer Science*, 330, 2 (2005), 339–348.

4. On Minimal Context-Free Insertion-Deletion Systems, *Journal of Automata, Languages and Combinatorics*, 12, 1–2 (2007), 317–328.

5. Recent Developments on Insertion-Deletion Systems, *Computer Science Journal of Moldova*, 18, 2 (2010), 210–245.

6. (with A. Alhazov) Minimization Strategies for Maximally Parallel Multiset Rewriting Systems, *Theoretical Computer Science*, 412, 17 (2011), 1581–1591.

7. (with F. Bernardini, M. Gheorghe, M. Margenstern) Generalized Communicating P Systems, *Theoretical Computer Science*, 404, 1–2 (2008), 170–184.

8. (with R. Freund) A Formal Framework for Static (Tissue) P Systems, *Proc. Membrane Computing, 8th International Workshop,* WMC 2007, Thessaloniki, Greece, June 25–28, 2007, *Revised Selected and Invited Papers*, *LNCS* 4860, Springer, 2007, 271–284.

9. (with J. Quiros, J. Viejo, A. Millan, M.J. Bellido) Fast Hardware Implementations of Static P Systems, *Computing and Informatics*, 35, 3 (2016), 687–718.

10. (with A. Alhazov, S. Ivanov, E. Pelz) Small Universal Deterministic Petri Nets with Inhibitor Arcs, *Journal of Automata, Languages and Combinatorics*, 21, 1–2 (2016), 7–26.

Personal web page: https://www.lacl.fr/verlan/

ZAHARIE, Daniela

Born on September 1, 1965, in Arad, Romania.

Education: University of Timişoara, Faculty of Natural Sciences, Mathematics – specialization in informatics (1983–1987).

PhD: West University of Timişoara, 1997. Thesis title: *Stochastic Models of Neural Networks and Applications*. Scientific advisor: Gheorghe Constantin.

Positions:
Analyst-Programmer: Computing Center – IAEM Timişoara, 1987–1990
Assistant Professor (1990–1992), Associate Professor (2001–2009), Professor (2000 – present): West University of Timişoara, Department of Computer Science.
Lecturer (1992–1999), Associate Professor (1999–2001): West University of Timişoara, Department of Probability Theory and Applied Mathematics.

Research areas:
Evolutionary computing and other nature inspired metaheuristics, artificial neural networks, data mining, machine learning, image processing, high performance computing, computational statistics, computational modeling in systems biology.

Main results:
In the field of evolutionary computing, the main results refer to the theoretical analysis of the behaviour of differential evolution algorithms, particularly the derivation of relationships between the expected variance of the population obtained by applying various mutation and crossover operators and the variance of the current population. Other results in this field refer to the theoretical and empirical analysis of multi-population algorithms designed to solve multi-objective or multi-modal optimization problems.
The main results in the data mining and machine learning fields refer to the applications of evolutionary algorithms and other bio-inspired metaheuristics in data clustering, mining of classification and association rules and in parameter estimation for compartmental models used in biology and medicine.
In the context of high-performance computing the main results are related to parallel implementations of evolutionary algorithms and of fuzzy clustering algorithms aiming to ensure efficient segmentation of large satellite images.

Editorial boards: *Soft Computing. A Fusion of Foundations, Methodologies and Applications* (associate editor); *Swarm and Evolutionary Computing*; *Annals of the West University of Timişoara, Mathematics-Informatics*.

Membership to professional organizations: IEEE Computational Intelligence Society, IEEE CIS Task Force on Differential Evolution, Romanian Association for Artificial Intelligence.

Honors, prizes, scientific distinctions: "Professor Zdzislaw Pawlak Best Paper Award" awarded by the Polish Information Processing Society at the Symposium AAIA, 2007.

Representative articles:

1. Critical Values for the Control Parameters of Differential Evolution Algorithms, in R. Matousek, P. Osmera, eds., *Proc. Mendel 2002, 8th International Conference on Soft Computing*, Brno, Czech Republic, June 2002, 62–67.
2. Control of Population Diversity and Adaptation in Differential Evolution Algorithms, in R. Matousek, P. Osmera, eds., *Proc. Mendel 2003, 9th International Conference on Soft Computing*, Brno, Czech Republic, June 2003, 41–46.
3. (with D. Petcu) Adaptive Pareto Differential Evolution and Its Parallelization, *Proc. 5th International Conference on Parallel Processing and Applied Mathematics*, Czestochowa, Poland, Sept. 2003, *LNCS* 3019, Springer, 2004, 261–268.
4. A Multipopulation Differential Evolution Algorithm for Multimodal Optimization, in R. Matousek, P. Osmera, eds., *Proc. Mendel 2004, 10th International Conference on Soft Computing*, Brno, June 2004, 17–22.
5. (with G. Ciobanu) Distributed Evolutionary Algorithms Inspired by Membranes in Solving Continuous Optimization Problems, in H.J. Hoogeboom, Gh. Păun, G. Rozenberg, A. Salomaa, eds., *Membrane Computing, WMC* 2006, *LNCS* 4361, Springer, 2006, 536–553.
6. Statistical Properties of Differential Evolution and Related Random Search Algorithms, in Paula Brito, ed., *Proc. International Conference on Computational Statistics*, Porto, Portugal, August 24–29, Physica-Verlag HD, 2008, 473–485.
7. (with D. Lungeanu, F. Zamfirache) Interactive Search of Rules in Medical Data Using Multiobjective Evolutionary Algorithms, in *Proc. 2008 GECCO Conference Genetic and Evolutionary Computation* (workshop *MedGEC–Medical Applications of Genetic and Evolutionary Computation*), Atlanta, August 2008, 2065–2072.
8. Influence of Crossover on the Behavior of the Differential Evolution Algorithm, *Applied Soft Computing*, 9, 3 (2009), 1126–1138.
9. (with L. Moatar-Moleriu, V. Negru) Particularities of Evolutionary Parameter Estimation in Multistage Compartmental Models of Thymocyte Dynamics, *Proc. Conference on Genetic and Evolutionarz Computation, GECCO'13*, July 6–10, Amsterdam, 2013, 303–310.
10. (with F. Micota) Revisiting the Analysis of Population Variance in Differential Evolution Algorithms, *Proc. 2017 IEEE Congress on Evolutionary Computation* (CEC), June 5–8, San Sebastian, 2017, 1811–1818.

Personal web page: http://staff.fmi.uvt.ro/~daniela.zaharie

ZIMAND, Marius

Born on April 27, 1959, in Bucharest, Romania.

Education: University of Bucharest, Faculty of Mathematics, 1978–1982.

PhD in mathematics, University of Bucharest, 1991. Thesis title: *Positive Relativizations and Baire Classification in Computational Complexity.* Scientific advisor: Cristian Calude.

PhD in computer science, University of Rochester, USA, 1996. Thesis title: *Existential Theorems in Computational Complexity: Size and Robustness.* Scientific advisor: Lane Hemaspaandra.

Scholarships, postdoc stages:

Postgraduate Summer School on Combinatorial Optimization, Cortona, Italy, July–August 1990, organized by Council of National Research Italy.

Positions:

Research Institute for the Electrotechnical Industry (ICPE) 1982–1988.

University of Bucharest, 1989–1992 (Assistant Professor and Lecturer).

University of Rochester, 1992–1996 (Research and Teaching Assistant).

Georgia Southwestern State University 1996–1999 (Assistant Professor).

Towson University, 1999 – present (Assistant Professor, Associate Professor, Professor).

Research areas: Computational complexity, information theory.

Main results:

Distributed compression is the task of compressing correlated data by several parties, each one possessing one piece of data and acting separately. The classical Slepian-Wolf theorem shows that if data is generated by a memoryless stochastic process then distributed compression can achieve the same compression rates as centralized compression. The main result in paper 10, in the list below is the analogue version of the Slepian-Wolf theorem in the framework of algorithmic information theory. It has the advantage that it does not require the memoryless property (in fact, it does not require any generative model for the data that is being compressed).

Determining a minimal description of a string is a canonical example of a function that is not computable. In contrast, paper 9 reveals that a certain type of approximation, called list approximation, can be obtained for shortest descriptions of strings in a surprisingly efficient way: it is possible to construct a short list guaranteed to contain a close-to-optimal program for x.

Kolmogorov complexity extractors for infinite sequences (paper 5).

Exposure-resilient extractors and their utilization in the derandomization of sublinear time algorithms (paper 3).

Construction of seeded extractors from one-way permutations (paper 6).

There are functions that can be computed, using black-box access, by a polynomial-time quantum algorithm and for which every classical machine needs exponential-time on almost every input (paper 2).

Administrative positions: Director of the doctoral program at Towson University, 2010–2013.

Editorial boards: *Journal of Universal Computer Science* (Springer).

Membership to professional organizations: ACM, EATCS.

Honors, prizes, scientific distinctions:

ICALP 2005 Best Paper Award for paper 6 below.

Excellence in Scholarship Award, given by the Fischer College of Science and Mathematics, Towson University, Oct. 27, 2006.

CSR 2008 (*Computer Science in Russia Conference*) Best Paper Award for paper 5 below.

PhD students: Niakam Kazami (2011).

Books:

1. *Computational Complexity – A Quantitative Perspective*, Elsevier, 2004.

Representative articles:

1. Weighted NP Optimization Problems: Logical Definability and Approximation Properties, *SIAM J. on Computing*, 28, 1 (1999), 36–56.

2. (with E. Hemaspaandra, L. Hemaspaandra) Almost-Everywhere Superiority for Quantum Polynomial Time, *Information and Computation*, 175, 2 (2002), 171–181.

3. Exposure-Resilient Extractors and the Derandomization of Probabilistic Sublinear Time, *Computational Complexity*, 17, 2 (2008), 220–253.

4. (with C. Calude) Algorithmically Independent Sequences, *Information and Computation*, 208, 3 (2010), 292–308.

5. Two Sources Are Better than One for Increasing the Kolmogorov Complexity of Infinite Sequences, *Theory of Computing Systems*, 46, 4 (2010), 707–722 (special issue with selected papers from CSR'2008).

6. Simple Extractors Via Cryptographic Pseudo-Random Generators, *Theoretical Computer Science*, 411, 10 (2010), 1236–1250 (special issue with selected papers from *ICALP* 2005, Track C).

7. (with N.V. Vinodchandran) On Optimal Language Compression for Sets in PSPACE/poly, *Theory of Computing Systems*, 56, 3 (2015), 581–590.

8. (with J. Teutsch) On Approximate Decidability of Minimal Programs, *ACM Transaction on Computation Theory*, 7, 4 (2015).

9. (with B. Bauwens, A. Makhlin, N. Vereshchagin) Short Lists with Short Programs in Short Time, *Computational Complexity*, 31 pages (online 4/19/2017, printed version pending).

10. Kolmogorov Complexity Version of Slepian-Wolf Coding, *STOC 2017*, Montreal, Canada, June 19–23, 2017.

Personal web page: orion.towson.edu/~mzimand