Bucharest school of theoretical computer science

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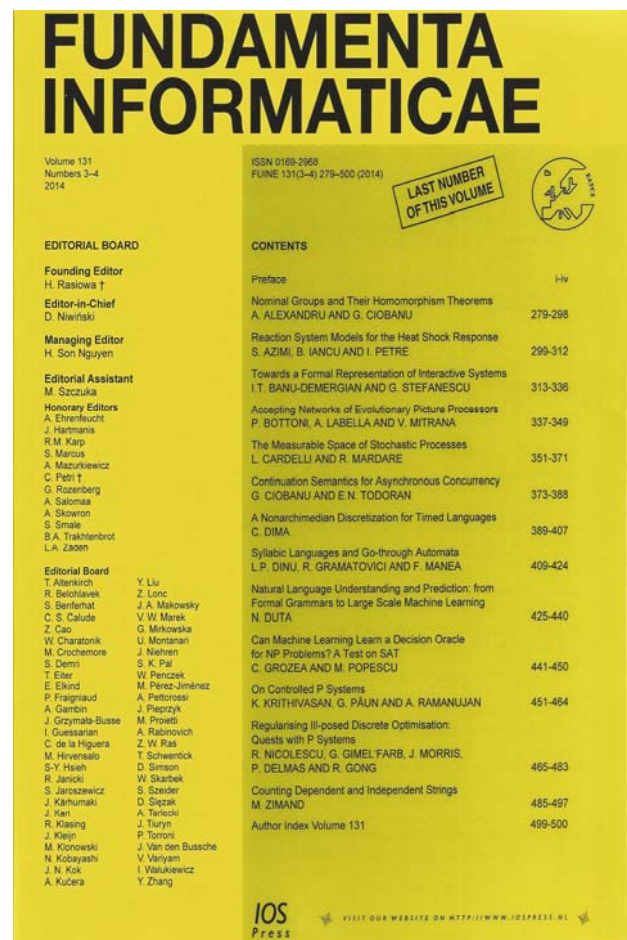[a]*Department of Computer Science, The University of Auckland, New Zealand*
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A special double-issue of the international journal Fundamenta Informaticae honouring eight distinguished professors who founded the Bucharest School of theoretical computer science has been published in 2014. We present a short account of the content of this special publication, the work of the honoured professors and the latest achievements of the School.

Keywords: Theoretical computer science, Bucharest school of theoretical computer science

It is quite common in many research fields to acknowledge outstanding contributions of significant impact of leading researchers through special volumes, *festschrifts*. It is not so often that a group or an entire research school is honoured this way. We have recently edited a special issue of the international journal Fundamenta Informaticae (volume 131, numbers 3-4, 2014), containing thirteen research papers dedicated to the founding fathers of the *Bucharest School of theoretical computer science*, shortly, the *School*, in alphabetical order Virgil E. Căzănescu, Leon Livovschi, Mircea Malița, Solomon Marcus, Constantin Popovici, Sergiu Rudeanu, Ioan Tomescu and Dragoş Vaida. Although some of these distinguished professors have been honoured on various occasions in special issues of international journals or books, it is for the first time when a publication is dedicated to their joint work.

The Romanian contributors to this volume are students and/or collaborators of the founders of the *School*; they have eleven co-authors from around the world. Senior Romanian authors have prestigious positions in Romania or abroad: Gheorghe Păun (Romanian Academy), Gabriel Ciobanu, Radu Gramatovici, Victor Mitrana, Marius Popescu, Gheorghe Ştefănescu are professors at the universities of Bucharest and Iasi, Cătălin Dima, Radu Mardare, Radu Nicolescu, Ion Petre, Marius Zimand are professors in universities in Europe, US, New Zealand and USA, and Nicolae Duţă, Cristian Grozea, Florin Manea are researchers in universities or companies in Europe and USA. The research topics cover a broad range of theoretical computer science areas, generically called, *Formal Models: Computability, Complexity, Applications*.

The fundamental role played by the University of Bucharest mathematician and logician Gr. C. Moisil (1906–1973) in the introduction and development of computer science in Romania, in educating the first generations of Romanian computer scientists and in widely publicizing the impact of this young discipline in economy, science and education is well known and documented (see, for example, the book

A. Iorgulescu, S. Marcus, S. Rudeanu, D. Vaida (eds.). *Grigore C. Moisil and His Followers in the Field of Theoretical Computer Science*, Ed. Academiei, Bucharest, 2007). All the founding fathers of the *School* have been Moisil's students and then collaborators. They continued the work started by Moisil, opened up new research avenues, thought modern computer science topics and mentored other research generations, including many of the contributors to this special issue.

V. Căzănescu (b. 1943) initiated the first applications of category theory to automata and machines; his main research is in algebraic models for the syntax and semantics of programming languages. **L. Livovschi** (1921 – 2012) initiated with Moisil the use of finite automata to the design of electronic circuits and published a book that synthesizes the Romanian research in this area. **M. Malița** (b. 1927), a mathematician and a professional diplomat, has authored many books in applied mathematics, logic and artificial intelligence, political sciences and education. **S. Marcus** (b. 1925) is one of the best internationally known and appreciated Romanian scientists. His impressive number of publications cover a broad spectrum of subjects, including mathematical analysis, mathematical and computational linguistics, theoretical computer science, linguistics, poetics, semiotics, philosophy and history of science and education. **C. Popovici** (b. 1930) has done research in number theory, automata theory and recursive functions. **S. Rudeanu** (b. 1935) is an algebraist who has extensively published in lattice theory, algebra and logics, universal and Boolean algebras, automata theory and graph theory. He has initiated (with P. L Hammer) the area of pseudo-Boolean programming which plays an important role in adiabatic quantum computing. **I. Tomescu** (b. 1942) is a mathematician and computer scientist with many works in combinatorics and graph theory. After a period in which he used computers for solving practical problems, **D. Vaida** (b. 1933) has focused on formal languages and compiling techniques, and algebraic models for the semantics of programming languages.

Over the years they all supervised many PhD students and taught various, undergraduate and graduate, courses at the University of Bucharest. Some of them have been involved in academic administrative activities, like head of departments (V. E. Căzănescu, I. Tomescu), director of the Romanian Academy Library (M. Malița) and deputy-director of UNESCO's European Centre for Higher Education (D. Vaida).

These distinguished professors have taught many generations of students not only advanced topics or the latest developments in theoretical computer science: through their personal examples, they have also promoted a high level of rigour in research. Their enthusiasm and passion were contagious.

Thinking back, the careers of these personalities have developed in adverse times, when access to information was severely restricted and sometimes just impossible, the communication with the international research community was very limited and barriers to free travel were immense. With enormous efforts—many times through their personal connections in neighbourhood countries and sporadic collaborations to international organisations—they helped their students and younger colleagues to obtain papers published in international journals, they facilitated the access to high profile research groups and compensated the lack of international journals and books in our academic libraries with an updated collection of review journals—like *Mathematical Reviews*, *Zentralblatt für Mathematik* and *Computing Reviews*. Even more importantly, individually and collectively, they have created a vibrant research environment where participants, professors and students alike, could cooperate to research projects at international standards.

The fact that these were not trivial tasks may be hard to imagine today when we have almost unlimited access to information, can freely travel and publish, and routinely Romanians, working at home or abroad, are active participants to international research networks and organisations.

It is very important that what has been inherited from our great predecessors is kept alive and passed onto the younger generations of the *School*. And indeed, *this is happening*. We illustrate with just one example: due to the worldwide recognition of the research done in the *School*, Bucharest is becoming an important centre for international meetings in theoretical computer science. In September 2014 the 11th International Colloquium on Theoretical Aspects of Computing was held at the Central University Library of Bucharest; it was preceded by the first edition of the Theory Day in Computer Science Workshop organised at the Faculty of Mathematics and Informatics of the University of Bucharest. Next year, the important conference Computability in Europe 2015: Evolving Computability will be organised at the University of Bucharest.

The *School* lives up to the standards of their founders.

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