Language-Theoretic Models
of Distributed Computing

A Collection of Papers in Honour
of the 50th Birthday of Victor Mitrana

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Professor Victor Mitrana was born in June 1958, and graduated from the University of Bucharest in 1986. His graduation paper was entitled "Strictly Deterministic Grammars", and was supervised by Professor Adrian Atanasiu. Professor Mitrana got his PhD from the same University in 1993, with a thesis close to the topic of our volume "Distributed Grammar Systems", supervised by Professor Gheorghe Păun.

Since 2002, Victor Mitrana holds a full-professor position in the chair of Fundamentals of Computer Science, in the Faculty of Mathematics and Computer Science, University of Bucharest.

During his career Professor Mitrana received many prizes and research fellowships: The "Gheorghe Lazăr Prize of the Romanian Academy" (1999), "Alexander von Humboldt Research Fellowship" (1995–1996, 1999, 2008), "I3 Accreditation, from the Spanish Scientific Research Evaluation Agency", "Research Fellowship from the Spanish Ministry of Education" (1999–2000), "Research Fellowship from the Catalan Government", "Ramon y Cajal Professor" position awarded by the Spanish Government (2003–2008), "Research Fellowship from the Japan Society for Promotion of Science" (2008), "Research Fellowship from the European Excellency Center of the Hungarian Academy" (2003).

Victor Mitrana's areas of research are Formal Languages and Automata, Unconventional Models of Computation, Combinatorics on Words, Algorithms and Data Structures, Computability and Complexity. In these domains, he wrote two books (in Romanian), a monograph (in English) and edited four collective volumes (published by Kluwer Academics, Taylor and Francis, and Springer-Verlag). He also authored or co-authored more than 170 papers published in scientific journals or conferences: 74 of his papers are indexed by ISI Web of Science, 103 are indexed in MathSciNet, 108 by ZentrallBlatt, and 104 by DBLP. From these journals we mention *Theoretical Computer Science, Acta Informatica, Theory of Computing Systems, Journal of Computer and System Sciences, Discrete Applied Mathematics, Mathematical Structures in Computer Science, Fundamenta Informatica, Information Processing Letters, Journal of Universal Computer Science, Journal of Automata Languages and Combinatorics, International Journal of Foundations of Computer Science, International Journal of Computer Mathematics, Bulletin of EATCS, Acta Cybernetica*; it is worth mentioning that Professor Mitrana also published two papers, were problems from biology were formalized and aproached using theoretical computer science tools, in two important biology journals: *Biosystems* and *Comparative and Functional Genomics*. Victor Mitrana is the sole author of 31 papers, and he has 46 distinct co-authors from Europe (Great Britain, Germany, Netherlands, France, Italy, Spain, Austria, Hungaria, Finland, Czech Republic, Slovakia, Romania), Japan, Canada, United States. His works were cited for more than 370 times in about 200 papers or books, by 148 authors (not counting citings of the common papers by co-authors). Professor Mitrana gave many invited conferences at universities from Germany (Magdeburg, Frankfurt, Hamburg), Finland (Turku), Japan (Kyoto, Tokyo), Italy (Roma, Pisa), Spain (Tarragona, Madrid, Valencia), Hungary (Budapest, Szeged), Belgium (Gent, Bruxelles), Czech Republic (Praga, Opava), Netherlands (Leiden), Austria (Vienna), Turkey (Istanbul).

The main results of Victor Mitrana are mostly related to distributed computing and its relation to the theory of formal languages. In the following we enumerate some of the results he authored or co-authored:

- The paper The Modular Grammars (1989) is considered one of the first and most important papers in the area of Grammar Systems; this paper basically gave birth to the study of the Distributed and Cooperating Grammar Systems, an important and intensively studied type of Grammar Systems. Related to this topic, the Hybrid Grammar Systems were introduced in a paper from 1993.

Both these papers are considered to have opened many research directions in Formal Languages, and are cited in all the monographs dedicated to the topic of Grammar Systems.

- As a counterpart of the previously mentioned works, Victor Mitrana co-initiated the study of Parallel and Communicating Automata Systems: these are accepting devices built to match the generating devices studied in the theory of Distributed and Cooperating Grammar Systems.

- In the area of DNA-computing, unconventional models of computation and computational biology, we mention the contributions at the formal study of some word-operations derived from biology and of some computational models inspired from biology. The newly defined computing model called Networks of Evolutionary Processors, based on a bio-chemical inspiration, quickly became a topic of interest in the domain: there are PhD thesis in this area, many research projects on this topic were recently funded in Europe, and there were already several Special Sessions of Theoretical Computer Science or Artificial Intelligence conferences dedicated to this type of computing model.

- In the area of Combinatorics on Words, the most important results are a characterization of primitive morphisms, the definitions of self-reading and self-adding sequences, and the defintion of measures of similarity between genomes based on several classical words-operations.

- Finally, many open problems, previously approached by other researchers, were solved in Mitrana's papers and, also, many open problems were proposed in his papers, some of them already solved.

Nevertheless, Professor Mitrana performs a constant service to the research community: he already supervised six PhD thesis and participated in the Referees Committee of many other PhD thesis; he is Associated Editor at the Journal of Computational and Applied Mathematics (Springer), and Editor at the Journal of Universal Computer Science (Springer), the Annals of the University of Bucharest (Publishing House of the Bucharest University), the International Journal of Applied Mathematics and Engineering Sciences (Waset Publishing House) and the Journal of Mathematics and Statistics (Science Publications); finally, he was part of the Program Committee at more than ten conferences, in Europe, Japan, Canada or the United States.

Professor Mitrana's influence, through research and teaching, can be already considered remarkable. A glimpse of it can be seen by reading the papers in this special issue. Everybody, student or colleague, who had the chance of working with him was marked by his ideas, his mathematical knowledge and abilities, but also by his friendly and collaborative personality. This is true for all collaborators to this volume who wish him *A Very Happy Anniversary!*