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A Teacher of Great Strengths

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Abstract

The research on formal languages and their algebraic relationships were among the topics that brought visibility to Romania in the field of computer science in the 1970's. Alexandru Ioan Cuza University of Iaşi was known by its researchers and teachers in these topics.

Language is the basis of human culture. Mathematics is a universal language transcending cultural borders. Theoretical computer science is a branch of mathematics in which the formal language theory is the discipline that studies the syntactic regularities for families of languages and classifies their formal grammars. This theory has several applications in theoretical linguistics, formal semantics and mathematical logic. Computer science students typically learn these topics during their undergraduate studies.

Dan Simovici graduated Mathematics in 1970, at a time where the Alexandru Ioan Cuza University of Iaşi started an educational and scientific effort to develop a strong school of computer science. Dan Simovici was among several young and clever mathematicians committed eagerly toward theoretical computer science. In 1974, his PhD thesis ('Contributions to the algebraic theory of automata') contained new results at the confluence of algebra, automata and formal grammars, some of them published in notable journals (for instance, the article 'Associative algebraic structures in the set of Boolean functions and some applications in automata theory' was published in IEEE Transactions on Computers).

Dan Simovici had a successful career as a researcher and teacher at Alexandru Ioan Cuza University. Most of his achievements contributed to the development of formal languages and algebraic theory of automata.

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The books he published in this period are significant: Algebraic Introduction in Computer Science (Automata and Formal Languages) in 1973-1974, Algebraic Coding Theory in 1976, Algebraic Theory of Semigroups with Applications in 1977. The most successful book was Formal Languages and Compiling Techniques published in 1978; it was used as textbook for an extended period of time in several Romanian universities.

I fondly remember a course given by Professor Simovici in 1980. I remember the large and clear writing on the blackboard, the smooth and perfectly logical development of the ideas, as well as the smile (sometimes gentle, sometimes ironic) of Professor Simovici. The course was pleasant, making the hours fly by quickly. There was a feeling as if there was not much to learn, but at the exam I realized there had been books of material covered. Overall, it was a wonderful course that I carry in my mind to this day, together with the memory of a teacher of great strengths.

I remember the meetings of the faculty members working in theoretical computer science. During these meeting, the members presented their work in progress, and the results were constructively discussed. After such a presentation, Professor Simovici made the following comment (and smiled): "I didn't identify an error (yet) in your proof, but if this result is correct then I can prove P=NP." It was a clear signal for me (as a young student) that Professor Simovici was a firm guardian of mathematical accuracy.

I feel fortunate to have crossed paths with Professor Simovici. I am grateful for the knowledge I received in those important years of growth as a student; Professor Simovici is one of those teachers who can leave a positive unforgettable mark and awaken enthusiasm for deep ideas and results. Over the years, I have discovered in a book of Professor Solomon Marcus a nice scientific connection between us: both of us are regarded as followers of Grigore Moisil, a well-known logician considered as the father of theoretical computer science in Romania.

Professor Simovici left Romania a few months after I took his course, settling at the University of Massachusetts Boston, where he is still active. Since 1984, he has been the Director of the Computer Science Graduate Program (from 1984). In 1991 he published the book Mathematical Foundations of Computer Science, in 1995, the volume Relational Database Systems, in 1999, the textbook Theory of Formal Languages with Applications, in 2008, his successful Mathematical Tools for Data Mining (the second edition in 2014), and recently, in 2021, the book Clustering - Theoretical and Practical Aspects. It is easy to see his wide interest in new topics, as well as broad col-

laboration publishing with several researchers. After being involved for many years as chair of the International Symposium for Multiple-Valued Logic, Professor Simovici became the editor of the Journal for Multiple-Valued Logic and Soft Computing for many years.

Discussing research topics with Professor Simovici is always challenging, and also a pleasure. The challenge comes from his wide knowledge of several fields; he had a special ability of identifying interesting problems as well as weak approaches. The pleasure comes from his cordial way of presenting things, revealing interesting insights on every topic - from art and history to the scientific community and philosophy.

In this issue of the journal Scientific Annals of Computer Science we celebrate not only the 80th birthday of Professor Simovici, but his personality, academic performance and scientific achievements.

Happy birthday, with many more years of good health and success!

Books of Professor Dan Simovici

- Algebraic Methods in Computer Science vol.1: Automata Theory (with Ion Creangă and Corina Reischer), Editura Junimea, 1973, 300p. (in Romanian)
- Algebraic Methods in Computer Science vol.2: Formal languages (with Ion Creangă and Corina Reischer), Editura Junimea, 1974, 235p. (in Romanian)
- Introduction to Algebraic Coding Theory (with Ion Creangă), Editura Didactica si Pedagogica, Bucharest, 1975, 248p. (in Romanian)
- Algebraic Theory of Semigroups with Applications (with Ion Creangă), Editura Tehnica, Bucharest, 1977, 256p. (in Romanian)
- Formal Languages and Compiling Techniques, Editura Didactica si Pedagogica, Bucharest, 1978, 360p. (in Romanian)
- Mathematical Foundations of Computer Science - Sets, Relations, and Induction (with Peter Fejer), Springer, 1991.
- Relational Database Systems (with Richard Tenney), Academic Press, 1995.
- Theory of Formal Languages with Applications (with Richard Tenney), World Scientific, 1999.

- Mathematical Tools for Data Mining - Set Theory, Partial Orders, Combinatorics (with Chabane Djeraba), Springer, 2008 (second edition 2014).
- Linear Algebra Tools for Data Mining , World Scientific, 2012.
- Mathematical Analysis for Machine Learning and Data Mining , World Scientific, 2018.
- Clustering - Theoretical and Practical Aspects. World-Scientific, 2021.