Obituary

Aldo de Luca
(1941–2018)

Aldo de Luca passed away on October 16th, 2018. This is a tremendous loss for his family, for his friends and colleagues, and for the community of theoretical computer science, in which he played a preeminent role.

Aldo was born in Naples, Italy, the 30th of November 1941 and he obtained his Degree in Physics cum laude at the University of Naples in 1964. Aldo's scientific activity started in the 1960's, during the extremely fervent intellectual period in Neapolitan scientific research. He collaborated with Eduardo Caianiello's Cybernetic group at the Institute of Theoretical Physics at the University of Naples. His scientific formation received special impact from the school "Automata Theory" organized by Caianiello in Ravello, Italy, in 1964, with the participation of researchers as Martin Davis, Warren McCulloch, Maurice Nivat, Michael Rabin and Marcel-Paul Schützenberger. At this school, which is considered one of the

landmarks in the early days of theoretical computer science in Italy, Aldo met for the first time Schützenberger, who would go on to have a strong influence on his scientific activity.

From 1967 to 1981 Aldo was a C.N.R. (National Research Council) researcher at the Institute of Cybernetics of Arco Felice. In 1972/1973, Schützenberger was visiting professor at the Institute of Cybernetics, and Aldo, under his influence, firmly moved his research to the theory of formal languages, codes and combinatorics on words.

In 1980 Aldo became full professor of algebra at the University of Naples "Federico II", then he moved to the University of Rome "La Sapienza", where he was full professor of computer science until 2003. At the same time, he spent some years at the Interdisciplinary center 'B. Segre' of the National Academy of Lincei, Italy. In 2003, he moved back to the University of Naples "Federico II", as a full professor of computer science, then emeritus professor.

Aldo was a pioneer of theoretical computer science in Italy. He was a member of EATCS since its creation, and he was one of the promoters of the Italian Chapter of the association. He was also one of the founders of the international conference WORDS, one of the most important conferences in the area of formal languages and automata theory.

Aldo was a passionate researcher, and was famous for his rigor in mathematics. His research interests covered a large range in the area of theoretical computer science, and during his life he worked on numerous topics, including: neural networks, theory of automata and formal languages; semigroups; combinatorics on words; theory of codes and information; algorithmic complexity and uncertainty measures; extensions of methods of combinatorics on words to non-linear combinatorial structures; algorithms on words and applications to the analysis of DNA sequences.

Aldo obtained deep and important results on these topics. Let us mention some examples of his contributions. In his paper with Settimo Termini "A definition of a nonprobabilistic entropy in the setting of fuzzy sets theory" (Information and Control, 1972), Aldo introduced non-probabilistic entropy in the setting of fuzzy sets theory. This was a pioneering paper and has been cited by a great number of authors. Another prominent example is the proof with Stefano Varricchio of the regularity of non-counting classes for $n > 4$ ("On non-counting regular classes", Theoretical Computer Science, 1992). This result, which solves a conjecture formulated in 1969 by Janusz Brzozowski, is impressive for the great difficulty of the problem and the fact that this was one of the most important open problems in automata theory. The proof required a lot of knowledge of theory of semigroups, automata theory, and combinatorics on words. Another top achievement concerns Sturmian words. His paper "Sturmian words: structure, combinatorics, and their arithmetics" (Theoretical Computer Science, 1997) is at the basis of several im-

portant developments and extensions of the theory of Sturmian words. Christophe Reutenauer once said that this paper is the 'Bible' on the subject. In his paper "Words and special factors" (Theoretical Computer Science, 2001), with Arturo Carpi, Aldo introduced a new approach in combinatorics on words associating with every word some characteristic parameters related to the repetitive structure of the word. This paper had a great influence in the theory of finite words.

Aldo was also a passionate and attractive teacher. His lectures were always well prepared and fascinating, and he was able to captivate the student interest even for difficult topics and deep mathematical concepts. To his disciples Aldo taught not only notions, methods and technicalities, but also a love for research.

Aldo advised numerous Ph.D. students, including Clelia De Felice, Arturo Carpi, Stefano Varricchio, Flavio D'Alessandro, Alessandro De Luca and Michelangelo Bucci. With Flavio, he wrote the wonderful book "Teoria degli Automi Finiti" (Theory of Finite Automata), while the collaboration with Stefano culminated into the famous monograph "Finiteness and Regularity in Semigroups and Formal Languages".

Aldo was a very curious person, and because of this he had a wide-ranging culture (going beyond scientific topics). The discussion with him was always interesting and deeply stimulating, on all kinds of subjects. Aldo was also a very pleasant person. We remember many wonderful moments with him, often at dinner, where we listened to fascinating scientific discussions, but also funny stories about people and places encountered in his long scientific career.

Those who had the good fortune to be close to Aldo, will always remember him as a very original researcher, a fascinating teacher, a generous colleague and a great friend.

Clelia De Felice
Gabriele Fici
Antonio Restivo

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