

Preface

This special issue is a tribute to Alberto Bertoni on the occasion of his 60th birthday, July 17, 2006. It collects works from co-authors, close friends or former students and covers many branches of Theoretical Computer Science to which Alberto contributed. This is the way the editors of this issue express their deep conviction that this area would not be what it is, had Alberto chosen to do research in Physics as he was initially tempted.

A SHORT BIOGRAPHY

Alberto Bertoni, the first of five children, was born in Barlassina, a small town north of Milano, July 17, 1946. His father (1911–1996) was an accountant for a local bank. His mother, Innocente Rosa Borghi, born in 1926, was trained as a primary school teacher but worked only one year as such. She is the cousin of the late physicist Don Carlo Borghi, a catholic priest who elaborated an original theory of the hydrogen atom and anticipated some ideas and experiments connected with cold fusion. Alberto is married to Luciana Peverelli who teaches French in high school.

He attended the local primary school (the five first years) in Barlassina. For the three following years he was a pupil in the secondary school in the region of Lombardia. Finally he spent the last five years in the liceo scientifico "Vittorio Veneto" in Milano before becoming a student in Physics at the Università degli Studi di Milano. At that time, the curriculum consisted of four years which ended with the defense of a "laurea" thesis. Alberto hesitated between working with Professor Occhialini on gravitational waves or writing a thesis on the theory of games à la von Neumann. In the end he chose to work in the theory of fuzzy sets under the supervision of Professor Giovanni Degli Antoni. He graduated in Physics with the highest grade and cum laude, July 22, 1970. His thesis was entitled "Teoria degli insiemi fuzzy e sue applicazioni alla teoria degli automi" (The theory of fuzzy sets and its applications to the theory of automata).

In order to better grasp Alberto's professional life, a few words on the general situation of Computer Science in Italy in the seventies from both viewpoints of research and teaching might be useful. In most countries, Computer Science emancipated from Mathematics. In Italy, it often emerged from Physics and many Computer Scientists born before 1950 graduated in Physics. In the specific case of the University of Milano, Computer Science was given visibility inside the research

structure of the Istituto di Fisica by the Gruppo di Elettronica e Cibernetica, then transformed in 1977 into the Istituto di Cibernetica, which formally accessed autonomy in 1986 as a full-fledged Dipartimento di Scienze dell'Informazione (Department of Information Sciences). Concerning teaching, the appointment for chairs in a given discipline was the result of a centralized process. A nationwide competition was organized and the winners were "called up" by the Universities to which the Ministry had allowed the opening of a position in that field. A curriculum in Computer Science was organized at the Università di Pisa in 1968 and for many years it remained the only one in Italy. An independent undergraduate course in Information Sciences was created at the University of Milano under the impulse of Professor Giovanni Degli Antoni in the academic year 1981-1982.

After his graduation, Alberto received a CNR fellowship for a couple of years, then a national research contract from the Ministry of Education. He also taught "Istituzioni di matematiche", an evening course of Mathematics in the Biology curriculum, as a lecturer under various statuses. In 1980 he competed for a position of full professor in Computer Science. He was listed among the winners and subsequently was called up by the University of Cosenza, Calabria. The next year, when the Università degli Studi di Milano obtained its degree in Computer Science he asked his transfer and moved back to Milano as a full professor.

THE SCIENTIST

Alberto contributed to the training of quite a number of researchers, through his advisory activity for over 150 degree theses ("lauree") in Computer Science, Mathematics and Physics and a score of PhD theses in Computer Science, Mathematics and Engineering. He sees his role not only as being available for interviews and sharing his knowledge on different scientific issues but also as giving handouts for all courses he teaches and occasionally writing monographs on emergent topics before they become fashionable. A personal experience of the French editor of this issue illustrates his gift as a lecturer. He met him for the first time in 1986 in a workshop held in Paris on the Theory of Traces. Alberto announced to the audience the well celebrated result of Wiesław Zielonka on asynchronous automata which he knew through a preliminary version. He was far from mastering French and yet he was able to provide a perfectly clear and intelligible explanation, quite an achievement. All those who have listened to his lectures or talks were struck by his great capacity of extracting the core of a topic. More generally, he never leaves unanswered a technical question, even when the person lacks the background, but he never simplifies to the point that his speech would be misleading.

Concerning research, one has to bear in mind that Alberto would have been a brilliant physicist had he not lived in the era of Informatics. The precise survey he wrote at the occasion of the event in honor of his relative Don Carlo Borghi shows how deep remains his understanding of the main issues that were at stake in Physics in Italy during the period 1930-1960. Physics is faced with the necessity of providing a coherent theory from experimental data subject to errors. A physicist must therefore abstract away from the measurements so as to go beyond apparent inconsistencies. In the language of Computer Science, the approach must

be “fault tolerant”. This requires intuition and capacity of abstraction. A more formal attitude which would try at any cost to design a theory which would match exactly all the data would probably be deemed to fail. The Computer Scientist is faced with similar difficulties. Alberto applies this skill in order to get correct statements for the property he investigates but at the same time he has the rigor of the mathematician when it comes to prove them. He is extremely versatile and has contributed to many areas such as formal languages and its extensions to trace theory and formal series with applications to random generation and counting problems, computational learning including neural networks and genetic models with applications to combinatorial optimization problems, complexity theory in the models of probabilistic and quantum machines as well as in various models of parallel computation.

THE ORGANIZER

At the local level, Alberto is greatly involved with the future development of his University and participates actively in the different steps of the construction of the new campus. This relatively unrewarding activity is typical of Alberto’s generosity and readiness to work for the good of his colleagues, students, university and more generally of his country without expecting a personal benefit.

He was co-promoter of the Italian Association of Theoretical Computer Science (Italian Chapter of EATCS), first President of this association for six years (1987-94) and Italian member in the Council of the European Association of Theoretical Computer Science. He is a member of the Editorial Board of Theoretical Informatics and Applications and has been a member of the Program Committee of several national and international conferences.

PARIS, MILANO, JUNE 2006
PAOLA CAMPADELLI
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