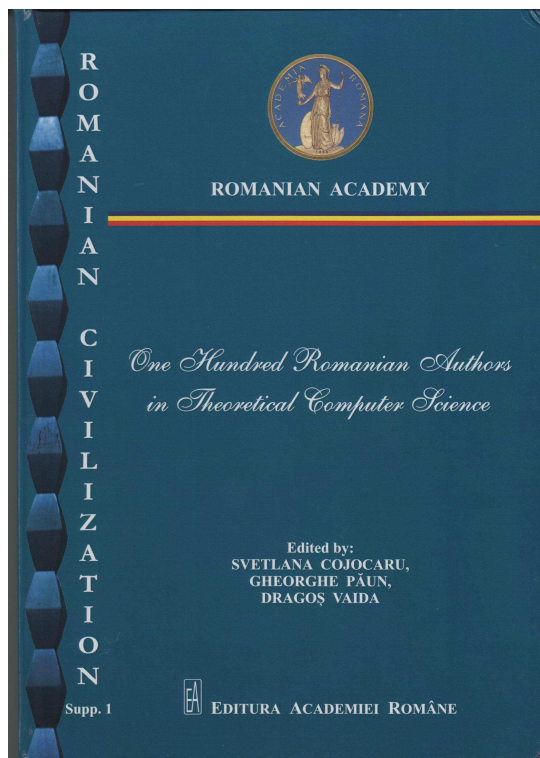


100 Romanian Authors in Theoretical Computer Science (presentation of the book)

Svetlana Cojocaru, Gheorghe Păun, Dragoş Vaida



This book [1] may look like a Who's Who in the Romanian Theoretical Computer Science (TCS), it is a considerable step towards such an ambitious goal, but the title should warn us in several aspects.

From the very beginning we started working with the book with the idea of collecting exactly 100 short CVs. This was an artificial decision with respect to the number of Romanian computer scientists, but natural in view of the circumstances the volume got born: it belongs to a series initiated

by the Romanian Academy on the occasion of celebrating one century since the Great Romania was formed, in the end of the First World War.

This series (coordinated by acad. Victor Spinei, the vice president of Romanian Academy) is simply monumental: Over 30 large volumes,

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with the common title *The Romanian Civilization*, covering many scientific and cultural areas, from history and geography to mathematics, physics, and chemistry, from geology and medicine to literature and music – including computer science.

The general volume dealing with computer science in *The Romanian Civilization* series appears under the coordination of acad. Florin Gheorghe Filip. It contains a chapter called *From the History of Romanian Theoretical Computer Science*, written by one of the present editors (Gh.P.). It is a quick overview of the Romanian theoretical computer science, in less than three dozens of pages, starting from the “pre-history” of computer science, in general, not only Romanian, namely, with the 1927 paper by Gabriel Sudan, who produced, at the same time and independently of W. Ackermann, the first example of a recursive function which is not primitive recursive. (We say that this is “pre-history”, because at that time computer science did not even exist, the terminology itself we used before was coined after 1930.) After that, the chapter shortly describes the activity of the two forerunners-patriarchs of the Romanian computer science, Grigore C. Moisil (see Fig.1) and Solomon Marcus (see Fig.2), both of them members of the



Figure 1. Grigore C. Moisil

Romanian Academy, and further it proceeds until our times, mentioning ideas, authors, groups, referring to both Romanians working in Romania and to Romanians spread over all the world, both to living persons and to persons passed away.

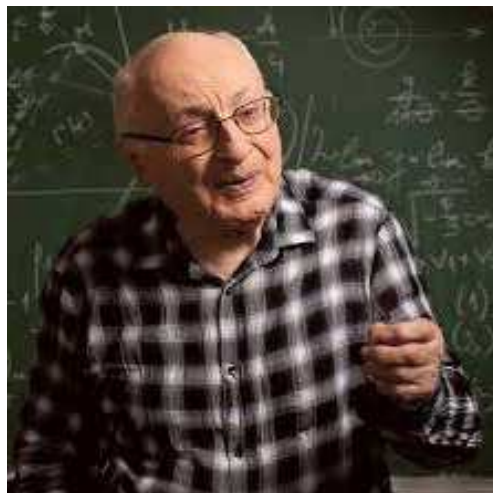


Figure 2. Solomon Marcus

Therefore, the term “history” should be understood in this framework in a broad sense, concerning the evolution of the field from the origins until the present days.

The mentioned *From the History...* chapter has obvious limits in what concerns the provided information and actually this was the starting point of the present book. The chapter is informal, hence the need for more technical details, at least at the bibliographical level, occurred. The present book provides such an information – including hints (e.g., personal web pages) on how and where more comprehensive details can be found.

However, this is done limiting to one hundred the number of presented scientists!... (One hundred, with the Centennial background, but also having in mind other limits such as the number of pages the

volume might have or the time to complete the project – also knowing that a comprehensive-complete Who’s Who of an encyclopedic-dictionary type is not very realistic for computer science, even restricting ourselves to the theoretical one.)

Thus, an obvious consequence follows: this volume does not suggest a hierarchy, an ordering of any type. Just 100 Romanian authors who have significantly contributed to the (theoretical) computer science, who (1) we were able to contact (hence we knew their email addresses), and (2) they answered positively to our invitation to contribute to the volume. Precisely, we have proposed to all of them to send us, until a certain deadline, a short presentation structured along of the items most of the presentations contain.

Many computer scientists colleagues, both from Romania and from other countries, are regretfully missing from this book. A tentative list, clearly incomplete, contains both “classic” names (acad. Mircea Malița, Peter Hammer-Ivănescu, Samuel Abraham, Teodor Rus, Constantin Popovici) and rather young persons (many in Romania, many abroad; hundred of successful doctorates in computer science were completed in the last decades, in universities from many places), including computer scientists with a well-established career (Grigore Roșu, Cătălin Dima, Răzvan Andonie, Cătălin Ioniță, Toader Jucan, Mihaela Malița, Mircea Sularia, Daniela Rus, Horia Georgescu, Virgil Emil Căzănescu, and so on and so forth). Also, only a few computer scientists who passed away were presented (in most cases with the help of disciples or colleagues of them present in the book), several others were omitted – among them: Andrei Baranga, Șerban Buzeteanu, Dumitru (Dan) Dumitrescu, Emil Muntean, Nicolae Țăndăreanu.

A second edition of the book, if any, will maybe contain most if not all of these names.

Another important point concerns the “definition” of the *set* of scientists to be present(ed) in the volume. This is definitely a *fuzzy set*, from two points of view: (1) what means *Romanian*, and (2) what means *theoretical*.

Because the book is dedicated to the Centenary of the Great Unity, we interpreted the term “Romanian” in a rather comprehensive man-

ner: *persons born in Romania or speaking Romanian language*, no matter which is their formal citizenship or where they are living-working. In particular, this was applied to our colleagues from Republic of Moldova – and this is valid also for the team of the three co-editors...

A much more difficult issue is that of what does theoretical computer science mean. The point was touched also in the beginning of the *From the History...* chapter. This is an endless discussion, about an undecidable (even false) problem. There is no borderline between theoretical and... what else, in the area of computer science? Hardware, software, applications? All of these areas involve “theory”. Furthermore, which is the difference between theoretical computer science and mathematics (applied to computing)?

Of course, we have proceeded intuitively (to come back to the idea of fuzzy sets: also there the membership function is often defined *subjectively...*).

At this stage it would be interesting and instructive to remind some significant ideas of our forerunner Professors. In the preface written in March 1968 of his Pergamon Press book from 1969 (*The Algebraic Theory of Switching Circuits*), Gr.C. Moisil gives three examples concerning the usefulness of the “new mathematics”, which ceases to be a quantitative science and begins to be a structural science: the mathematical linguistics, the pseudo-Boolean programming, and the theory of the programming languages, all of them pointing out to some priorities in the field of Theoretical Computer Science at the time. Moreover, he warns us not to forget that the first technical discipline based on this structural mathematics is the algebraic theory of switching circuits.

We would also like to cite the works of Solomon Marcus constantly emphasizing the pilot role of (formal) linguistics and mathematics, together with their cultural values, in other different bodies of knowledge such as economy, biology or physics. Accordingly, in his well-known *Reception Speech in the Romanian Academy*, he deals – perhaps for the first time in our context – with what should be understood by the common expression “mathematical language”. One shows that this language becomes *even the existential mode* for the object of the knowledge, a most interesting point of view for a philosophy of knowl-

edge viewed in a close solidarity with practical existence.

In short, this volume is only a first step on a long way, towards a comprehensive presentation of the Romanian computer scientists – but this is a volume providing a lot of information, both at a precise, bibliographical level, and at the global level, as a general view about the Romanian (theoretical) computer science. Many conclusions can be drawn starting from the data contained in this book. We only point out, very shortly, a few observations, a more detailed analysis remains for another framework.

Both in *time* (from “old” times to present) and in *space* (looking to the map of Romania and to the map of the Earth as well), the Romanian computer science is rather developed, diversified, synchronized and very well connected with the international computer science, both historically and geographically. Besides space and time, we can also add a third “dimension”, an internal one, the *range of topics* addressed by Romanian computer scientists. Again, we can note the close links (we may call it “isomorphism”) with the computer science in general: practically, all branches were explored, from logic to natural computing, from automata and language theory to algebraic approaches. A powerful science, indeed. The names of Romanian computer scientists can be found from top level bibliographies of theoretical contributions to managing positions in successful companies. The next pages is a proof, especially for the theoretical area. Another observation is related to the sociology of the domain: a large number of scientists presented in this book started their research activity, for master and doctoral studies, in the theoretical area, many of them in relation with faculties of mathematics and under the scientific guidance of mathematicians (open to computer science or even working in theoretical computer science), and then they became devoted mainly to teaching or to applications of computer science, in a wide range of domains.

A few words about the style of the volume could be here in order. We solicited presentations with a precise format, but the contributions correspond to (hence reflect) a great variety of personalities and career experiences, not to mention ages and cultural environments. We tried to unify as much as possible the materials, thus losing in a great ex-

tent the personal flavor of some of the received texts. This suggests a possible continuation of this endeavour: to put together in a volume personal recollections of computer scientists with an interesting life or working experience, especially of those who witnessed the beginning of Romanian computer science or they have participated in significant developments, theoretical or of other nature. We would like to come back to such a project.

Of course, this volume was only possible due to the participation of the computer scientists present in it – we are indebted to all of them for the efficient and smooth cooperation. Several colleagues, some of them mentioned in the pages which follow, have contributed with texts, with comments, corrections – our thanks and indebtedness.

References

- [1] *One Hundred Romanian Authors in Theoretical Computer Science* (Romanian Civilisation), S.Cojocaru, G.Păun and D.Vaida, Eds. Bucharest: The Publ. House of the Romanian Academy, 2018, 304 p.

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