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NEVERTHELESS, THERE IS A COMPUTER SCIENCE

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Is there a Computer Science, and if there exists this Science, what is it? What are its fields, and how must we teach it?

The debate on this subject is an old one [1, 2, 4, 5, 6, 7, 8, 10, 11]. There are today many Computer Science Departments all over the world, there are many specialized Computer Science Journals, and there are a lot of applications. Now, there isn't a human activity where this new science is not present. In spite of all these facts there are our colleagues from Mathematical Department who are saying that there is not a Computer Science, that it emerged only a new branch of Mathematics. It is not our intention here to polemize with them on this subject. But this new Journal is a new fact that proves the existence of Computer Scientists in our Department.

Therefore, among the other Journals of our University, a new Scientific Journal appears. The Computer Science Department of our University will support an Academic Journal of Science and Information Technology. This journal addresses to scientific Community and tries to present the scientific results of this field.

We all know the fast evolution of this Computer Science. There was not in the entire history of all sciences such a high rate of development as Computer Science had. All happened in only 50 years. And in the last 25 years the computers power grew up 1000 times; it is presumed that in the next 25 years it will again grow up 1000 times.

A journal exists for its readers. The best journal is that one that satisfies these readers. Computer Science is not only very dynamic, but also an immense field; from Mathematical Foundations of Computers to Computer Applications, from Formal and

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Programming Languages Theory to Software Engineering, from Data Bases to Computer Architecture, from Operating Systems to Artificial Intelligence, from Computer Networks to Communications Management, and these are only a few. For the beginning, research in all fields is welcome in the pages of this journal. We accept any cooperation, we wait for all computer scientists to become not only our readers, but also, to publish their research in the pages of this journal.

Publishing the most recent results of scientific research, this journal will give us the possibility to be informed and to understand, to spread our results, or to show new research directions, even if we are at the beginning and the main research and computer technology are created in the more developed countries. But the important ideas can appear everywhere, and the change of views is very important to us.

Studia Journal, Computer Science series, will outline our scientific standing in the Romanian and world's academic community. The detachement of this journal from the mathematical one is a very important step made by us.

A few years ago, in a didactic activity with school teachers, the second author of this paper has compared Computer Science and Mathematics with two brothers, first - very young and second - a mature one. The mathematicians disagreed, but the situation is rapidly changing. Computer Science is becoming a very fast maturing science, and no other science has appeared in such a short time. More, Computer Science is spread over almost all human activities. It has influenced and helped the development of all other sciences. It made possible to solve some problems impossible to be solved in the absence of computers.

The history and the progress made in Computer and Information Technology is presented in a special issue of IBM Journal of Research and Development [12]. Then, the history of Computer Science Education can be read from [2, 6, 8].

But what is Computer Science? Certainly, Computer Science is not the science of computers. It appeared due to these wonderful machines called computers. But as Hartmanis defined it [7], it is the science of information processing. It deals with the

systems that create, store, and process information. It differs from all other sciences by its immense field of applications.

Some similarities and differences between Mathematics and Computer Science are presented by Knuth [9]. Certainly, Computer Science has emphasized the important role of constructions in all branches of Mathematics. One important difference is mentioned by Knuth in [9]: Computer Science is a very young science which is developing very fast. The curriculum is also very rapidly changing, in contrast to a much slower change present in mathematical courses. It has in common with Mathematics the process of abstractions. The computer scientists has to create complicate systems, to design them at different levels of abstraction, to implement them with high precision, to motivate their correctness.

Certainly, Mathematics and Computer Science influence each other [1, 9, 10]. The first one offers its methods, the second one puts a lot of new problems not only for computer scientists but also for mathematicians.

The first generation of Computer Science undergraduates of our University started their studies in 1971. Therefore, Computer Science activity at our University is around 25 years old. During these years the research activity covered the following fields: programming and formal languages, programming methodology, fuzzy systems and their applications, artificial intelligence, parallel computation and distributed systems, operating systems, data bases, computer graphics, computer applications, and teaching methodologies. This activity is described in [3]. Here is a short survey of this activity.

In the field of programming and formal languages, as everywhere in the world at that time, there were studies in syntactic and semantic analysis and translators: interpreters and compilers with error correcting capabilities.

Then, we were concerned with the improvement of the programming methods and languages, due to the necessity of the teaching process and, also, due to the existing

software crisis. There were studies related to structured programming, improving programming languages, the methodology of programming, object- oriented programming, program correctness, program analysis.

The mathematical foundation of fuzzy systems and their applications were also studied. The most important results are: the degree of nonambiguity of a fuzzy set was defined in various classes of fuzzy measures and fuzzy partitions; entropy of a fuzzy partition was defined, and it was used to propose a new theory of information.

In the field of artificial intelligence, results were obtained in the following directions: pattern recognition and hierarchical classification; automated theorem proving and rewriting systems; symbolic computation; genetic algorithms.

Parallel computation and distributed system were other directions of research; the following themes were tackled: distributed data bases; concurent or parallel programming; distributed systems modelling.

In the field of operating systems, the problem of memory allocation was studied, a file system was proposed, and some Romanian books in this field have been written.

Relational data bases, and the retrieval of information from a data base were also studied. Algorithms for the approximation of curves and surfaces, and for computer graphics were given.

Also, some concrete problems in other fields of science were solved: classification, statistics, and simulation applied in agronomy, archaeology, chemistry, engineering, geography, geology, and celestial mechanics.

Some of our enthusiastic colleagues have implemented, in their free time, a lot of useful programs for the University, and many of us have solved problems from economy and industry. This is not a research activity but, at least in the first years, it had a serious impact on our teaching and research activity.

In the teaching activity there was an strong shortage of books for students. An important part of our time was used for printing our lectures as student courses or published books.

Certainly, everybody will continue to investigate his own field of research. There is the will to keep up with the world research in the directions mentioned above. We think there is a continuous need to improve our own programming paradigms, including object-oriented programming. There is a continuous need to contribute to the mathematical foundations of computer science. It is very important to investigate the data bases and public networks. In the future the declarative and nonprocedural programming can be more important than procedural programming. Also, we must keep open our mind to the problems of other fields of science.

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