

COMPUTER SCIENCE, INFORMATICS, AND NATURAL COMPUTING

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The spectacular progress in Information and Communication Technology (ICT) is very much supported by the evolution of computer science which designs and develops the instruments needed for this progress: computers, computer networks, software methodologies, etc. Since ICT has such a tremendous impact on our everyday life, so does computer science.

However, there is much more to computer science than ICT: it is the science of information processing, and as such it is a fundamental science for other scientific disciplines. On the one hand, the only common denominator for research done in all so diverse areas of computer science is thinking about various aspects of information processing. Therefore, frequently used (mostly in Europe) term “Informatics” is much better than “Computer Science” – the latter stipulates that a specific instrument, viz., computer, is the main research topic of our discipline. On the other hand, one of the important developments of the last century for a number of other scientific disciplines is the adoption of Information and Information Processing as their central notions and thinking habits – biology and physics are beautiful examples here. For these scientific disciplines informatics provides not only instruments but also a way of thinking.

I am convinced that one of the Grand Challenges of informatics is to understand the world around us in terms of information processing. Each time progress is made in achieving this goal, both the world around us and informatics benefits. Since nature is a dominating part of the world around us, one way to understand this world in terms of information processing is to study computing taking place in nature. Natural Computing is concerned with this type of computing as well as with its main benefit for informatics, viz., human-designed computing inspired by nature. Research in natural computing is genuinely interdisciplinary, and therefore natural computing forms a bridge between informatics and natural sciences. It has already contributed enormously to human-designed computing: consider, e.g., all the advances made through neural networks, evolutionary algorithms, quantum computing and molecular computing. Most importantly, this research has led already to a deeper and broader understanding of the nature of computation.

In summary: the attractiveness and beauty of informatics as a science is that while it is a fundamental science for a number of scientific disciplines, it is also

the main force behind the development of ICT, and through this development it influences and revolutionizes our everyday life. Natural computing is an important vehicle of progress for both of these facets of informatics. Let's propagate then and develop the science of informatics (and present it to "the outside world") this way. Both informatics (viewed as above) and natural computing have great future!!!