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Teaching Fundamental Concepts of Informatics

4th International Conference on Informatics in Secondary
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Proceedings

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Preface

The International Conference on Informatics in Secondary Schools: Evolution and Perspective (ISSEP) is an emerging forum for researchers and practitioners in the area of computer science education with a focus on secondary schools.

The ISSEP series started in 2005 in Klagenfurt, and continued in 2006 in Vilnius, and in 2008 in Toruń. The 4th ISSEP took part in Zurich. This volume presents 4 of the 5 invited talks and 14 regular contributions chosen from 32 submissions to ISSEP 2010.

The ISSEP conference series is devoted to all aspects of computer science teaching. In the preface of the proceedings of ISSEP 2006, Roland Mittermeir wrote: “ISSEP aims at educating ‘informatics proper’ by showing the beauty of the discipline, hoping to create interest in a later professional career in computing, and it will give answers different from the opinion of those who used to familiarize pupils with the basics of ICT in order to achieve computer literacy for the young generation.” This is an important message at this time, when several countries have reduced teaching informatics to educating about current software packages that change from year to year. The goal of ISSEP is to support teaching of the basic concepts and methods of informatics, thereby making it a subject in secondary schools that is comparable in depth and requirements with mathematics or natural sciences. As we tried to present in our book “Algorithmic Adventures. From Knowledge to Magic,” we aim at teaching informatics as a challenging scientific discipline, full of puzzles, challenges, magic and surprising discoveries. Additionally, this way of teaching informatics is also a chance to import the concept of engineering to schools, by merging the mathematical analytic way of thinking with the constructive work of engineers in the education of one subject.

To underline informatics as well as informatics didactics as scientific disciplines, ISSEP 2010 had two special tracks. The track “Contributions of Competitions to Informatics Education” was based on the fact that taking part in different kinds of competitions provides a valuable contribution to knowledge acquisition and supports the development of problem-solving skills in a creative way. Organizing a competition includes addressing the following two questions:

- Which kinds of competitions are especially well suited for achieving which goals?
- How should one create and choose tasks and rules for such competitions?
- What are the achievements of the competition participants, in particular in relation to their training process?
- What is the influence of competitions on the educational processes in secondary education?

The starting point to this track was provided by the invited talk “Sustaining Informatics Education by Contests” by Valentina Dagienė.

The second track, “Empirical Research,” pointed out that the community of computer science didactics has to strengthen its effort in empirical research in order to be as serious as the didactics of mathematics and physics are. The main questions posed were:

- What is “good empirical research?”
- Which rules should be followed to produce “good” empirical results?
- Which criteria can be applied to recognize “good” empirical results?
- What are the pitfalls of interpreting empirical results?

To make ISSEP 2010 attractive due to high-quality contributions, we increased the number of invited speakers to five. In addition to Valentina Dagiene (Vilnius), we invited the internationally leading experts David Ginat (Tel Aviv University), David Gries (Cornell University), Allen B. Tucker (Bowdoin College), and Amiram Yehudai (Tel Aviv University) to give talks about different aspects of computer science education.

I would like to express my deepest thanks to all members of the Program Committee for serving and thus contributing to the high standard of the ISSEP series among the conferences devoted to computer science education.

November 2009

Juraj Hromkovič

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