Foreword

IOI, the International Olympiad in Informatics, is an annual international informatics competition for individual contestants from over 80 invited countries, accompanied by a one-day scientific conference for delegation leaders, organisers and guests. The IOI community has an excellent opportunity to communicate during this international event. Many countries have a variety of things to present and discuss.

The IOI journal is focused on the research and practice of computing professionals who work in the field of teaching informatics to talented secondary and high school students. The journal is closely connected to the scientific conference annually organized during the IOI. The 13th volume has two tracks: the first section of the journal focuses on research, and the second section is devoted to sharing national experiences. In this volume we include the work of some regular contributors to the journal, and also the work of some new authors.

In his paper, D. Ginat argues that algorithmic problem solving involves a collection of implicit notions, which may be considered as tools, since they are repeatedly utilized in various ways, particularly in challenging algorithmics. He says that often employment of these notions is essential, and they pave the way to a desired solution prior to utilization of algorithms and data structures. T. Verhoeff presents his thoughts on programming, software development, and computer science (CS), and their inevitable relationship – "the Golden Triangle".

Some of the other papers in this volume deal with teaching programming in primary and secondary schools. M. Dolinsky and M. Dolinskaya introduce an approach on how to begin the process of teaching programming to elementary school pupils, by training them to write simple programs – programs that deal with numbers. According to the authors, this learning stage should follow the two previous stages in the process: mental skills development, and learning the keywords of the programming language taught.

M. Weigend, J. Vanicek, Z. Pluhar and I. Pesek explore the potential of using creative unplugged activities in the classroom for Computational Thinking education. They propose a model which consists of 4 types of creative unplugged activities, and they also present the results of an international survey conducted in 2018, regarding the proposed model. In their papers, S. Combefis, G. de Moffarts and M. Jovanov present a new digital library with resources to teach and learn computer science, and M. Lodi, D. Malchiodi, M. Monga, A. Morpurgo and B. Spieler present a survey on the constructionist attempts at supporting the learning of computer programming.

Set of authors present some valuable results from surveys they conducted in Japan. T. Kakeshita, N. Takahashi, K. Sumi and M. Ohtsuki present comprehensive analyses of

three different nationwide surveys on the status of computing education, conducted at the Japanese universities. The first survey (Kakeshita & Ohtsuki) focuses on informatics in general education, and the second one (Kakeshita, Takahash & Ohtsuki) concerns computing education at non-IT departments in Japan. The third one (Sumi, Ohtsuki & Kakeshita) is on computing education at Japanese universities, as subject of "information" for high school teacher's license.

Finally, W. van der Vegt and E. Schrijvers present a method on how to analyse task difficulty in a Bebras contest using Cuttle, and M. Jancheski and S. Janceska discuss on multidisciplinary, multilingual, multilevel and multipurpose usage of the GeoGebra software in education.

We understand and support the need for continuing to share our national experiences – our problems are common problems. In the second part of the volume, authors from a few countries presented their experience, news and new approaches.

A report on the organization of the Cyprus Olympiad in Informatics done by P. Eracleous, P. Pavlikas, A. Ttofari, and A. Charalampous review the contest format used for each of the different age groups, as well as the tools and methods utilized in the process of preparation and selection of the national teams of Cyprus for the international competitions.

M. S. Tsvetkova and V. M. Kiryukhin inform about the need to introduce a new profession in the modern society named Digital Curator – consultant in the field of digital literacy. They explain the role of the digital curator and discuss the competencies in detail.

Representatives from this year's IOI hosting country, Azerbaijan, Y. Tabesh, S. Zarkesh, A. Zarkesh and I. Fazilova, present their experience on computational thinking in K-12. M. Taki and A. Alnahhas present an annual computer science competition in Syria for children aged between 8 and 15 years, which aims at preparing new generations for the future in computer science.

K. Merjalali, A. Keivan Mohtashami, M. Roghani and H. Zarrabi-Zahed present a tool for developing tasks in programming contests called TPS (Task Preparation System), which was successfully used in IOI 2017, and since then – in several other nationwide and international programming contests. Finally, M. Medvediev discusses on the use of the E-Olymp internet portal in programming competitions, a portal that so far supports four languages (Ukrainian, Russian, English and Azerbaijani).

Many thanks to all of those who have assisted with the volume – especially authors and reviewers as well as the Editorial Board of this journal. A lot of work is required by authors, far before starting to write the paper, and there is a lot of work to be done in the process after submitting the first version of the paper until the final version ready for print. In particular, we would like to thank the organisational committee of this year's IOI in Baku for giving us the opportunity to host the IOI conference.

Editors