

## Foreword

The publication of this issue marks a milestone in the International Olympiad in Informatics (IOI): for the first time in three years, the IOI is returning on-site. Alongside it, we will have the first face-to-face IOI conference since 2019.

The IOI will be held in Hungary from August 28th to September 4th, 2023, in commemoration of the renowned mathematician and computer scientist, John von Neumann. This year marks the 120th anniversary of Neumann’s birth, and Hungary has organized a series of remarkable events to honour his legacy. The IOI serves as the pinnacle event for the IOI community, among various commemorations: exhibitions, conferences, competitions, scholarships, the Neumann Memorial Coin, and the publication of various books.



Neumann János’ collector coin

<https://www.mnb.hu/en/banknotes-and-coins/collector-and-commemorative-coins/2023/collector-coin-to-honour-john-von-neumann>

Hungary, having hosted the IOI once before in 1996, is privileged to have been granted the opportunity once again. The success of the previous IOI, held in Veszprém, under the leadership of the Neumann Society and Eötvös Loránd University (ELTE), has left an indelible mark on our community. This time, a team of professionals from ELTE has prepared the tasks for the competition. Our community at ELTE has an extensive experience in competitive programming, including the development of study materials for talented students, organizing national competitions, selection contests, and preparation camps, as well as being leaders in international Olympiads, we are confident in the quality of the tasks presented.

Participants will be guided by the international student community of the University of Szeged (SZTE, Your Future – Our Mission), where they will have the opportunity to experience the city’s hospitality. Moreover, Szeged is home to one of the world’s largest collections of historical computers, showcasing the evolution of technology in both Eastern and Western countries. The Neumann Society’s experts have diligently expanded and made part of this impressive collection accessible online through the Informatics History Forum (<https://ajovomultja.hu>).

The IOI journal – closely tied to the annual scientific conference held during the IOI – presents the newest research and best practices of computing professionals involved in teaching informatics to talented secondary and high school students. In this 17th volume, we have curated an array of diverse and captivating articles. Firstly, we are delighted to present a unique paper that reminisces about the life and legacy of John von Neumann, enriched with captivating stories and fascinating pictures from his era.

The second part of the volume focuses on research. With distinguished lecturers from ELTE contributing four papers that delve into various topics. Bence Gaál presents unplugged activities with Micro:bits and explores the challenges of robotics activities during a pandemic. László Menyhárt *et al.* analyse an intriguing algorithm related to competitive programming, specifically examining the emergence and mathematical background of variants of the prefix sum. Márton Visnovitz *et al.* discuss current trends in teaching programming in Hungary.

Georgio Audrito *et al.* share their experiences and lessons learned from the introduction of a new talent selection competition. Additionally, Vania Natalia *et al.* conduct an analysis of Indonesian students' computational thinking (CT) knowledge based on their participation in the Bebras challenge, offering insightful ideas for improvement. Pavel Pankov *et al.* present an engaging paper that delves into knowledge beyond the IOI syllabus, highlighting the significance of mathematics, other STEM subjects, and general knowledge required in competitions. They propose time-dependent tasks along with a corresponding time checker. Lastly, Tom Verhoff sheds new light on recursion, exploring its intricacies and providing fresh perspectives on this divisive yet intriguing problem-solving technique.

The third part of this volume features four reports based on national experiences and important news within our community. Michael Dolinsky presents a report on traditional programming Olympiads in the Gomel region for grades 5–8, encompassing motivational aspects. Felix Jingga *et al.* share the impact of changes in the preparation methods of the Indonesian team on their results in the IOI. We also have a report on the national Olympiads in Sri Lanka, followed by Mārtiņš Opmanis *et al.*'s insights into the challenges of a new team competition that allows the use of Internet resources.

Lastly, in the fourth part of this volume, Orit Hazzan *et al.* introduce an innovative and interdisciplinary approach to teaching data science, offering valuable insights into this emerging field.

We would like to express our deepest gratitude to all those who have contributed to this volume, particularly the authors and reviewers. Their dedication and hard work, not only in writing the papers but also in the extensive review and correction process, have been instrumental in producing this exceptional collection. May it be a memorable and enriching experience for everyone involved. We extend our warmest regards to all participants, speakers on the conference, and members of the IOI community, as we eagerly anticipate the upcoming event in Hungary. May it be a memorable and enriching experience for everyone involved.

Editors