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Mathematics in Computer Science

Foreword

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The Applications of Computer Algebra (ACA) conference series is devoted to promoting all kinds of Computer Algebra applications, and encouraging the interaction of developers of Computer Algebra Systems and packages with researchers and users (including mathematicians, scientists, engineers, and educators in all these fields). Topics include, but are not limited to, Computer Algebra in the sciences, engineering, communication, medicine, pure and applied mathematics, education and computer science.

The 23rd conference in the series, ACA 2017, was held at Jerusalem College of Technology in Israel, July 21st–27th, 2017. It was the first ACA conference ever held in Israel. Ilias Kotsireas and Thierry Dana-Picard served as general co-chairs of ACA 2017, while Stanly Sternberg, Eugenio Roanes-Lozano and Michael Wester served as Advisory Committee. The conference commemorated the souvenir of Jonathan Borwein, who passed away a short time before the conference. Doron Zeilberger (Rutgers University) delivered a special memorial lecture, on "Jonathan Borwein: a PiONEER of Experimental Mathematics".

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Very few mathematicians manage to transcend the boundaries of more than one mathematical discipline and make substantial contributions to several areas of Mathematics. Jon was undeniably one of them. He was a paragon of Experimental Mathematics, Symbolic Computation, Functional Analysis, Optimization and other areas. His research work has already inspired thousands of individual researchers and will remain as a testament to this generation and to the coming ones.

The conference featured 5 other invited speakers:

- Sara Hershkovitz (Center for Educational Technology, Tel Aviv), who spoke on "Enhancing Teachers' and Students' Mathematical Knowledge in a Technology-Rich Environment".
- Rob Corless (Western University, London, ON, Canada), who spoke on "Gamma and Factorial in the Monthly".
- Bruno Buchberger (RISC, Johannes Kepler University, Linz, Austria), who spoke on "Teaching Math to Lady M".
- Stephen Watt (University of Waterloo, ON, Canada), who spoke on "Computer Algebra in Online STEM Education".
- Alfred Inselberg (School of Mathematical Sciences, Tel Aviv University, Israel), who spoke on "Parallel Coordinates: Visual Multidimensional Geometry and its Applications".

ACA 2017 has received a grant by the Israel Mathematical Union, and was also supported by Maplesoft, Wolfram and the Emmy Noether Institute (thanks to Prof. Mina Teicher). Omer Yagel, from DigiSec Ltd. and the representative of Maplesoft in Israel, delivered a special lecture on "Free Students' Exercise Notebooks and Maple 2017 News", and Erez Kaminski, the representative of Wolfram in Israel, delivered a lecture on "New in the Wolfram Language - making Machine Learning and other modern computing disciplines easy to use".

As usual in ACA conferences, the conference was structured as a series of special sessions:

- Applied and Computational Algebraic Topology
- Computer differential and difference algebra and its applications
- Computer algebra modeling in science and engineering
- Computational Algebraic Geometry, and Post-Quantum Cryptography—Multivariate Public Key Cryptography.
- Computer Algebra for Applied Physics
- Computer Algebra for Dynamical Systems and Celestial Mechanics
- Algorithmic Combinatorics
- Geometry of Plane Curves
- Automated Theorem Proving in Dynamic Geometry
- Algebraic methods in geometric modeling
- Parametric polynomial systems
- Computer Algebra in image processing
- Computer Algebra in Algebraic Graph Theory
- High-performance Computer Algebra
- General session

The conference book of abstracts was published on-line as a 319-page .pdf file and is accessible on the conference webpage.

During the conference, about 140 talks have been presented. This special issue of Mathematics in Computer Science (MCS) contains 26 formally refereed articles, accepted from 34 submissions of full papers presented (or related to presentations) at ACA 2017. We wish to express our sincere thanks to the anonymous referees who provided constructive and detailed referee reports that helped the authors of accepted papers to improve the papers substantially. Without their hard work, it would not have been possible to produce the current MCS special issue.