

Communications in Computer and Information Science


1090

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Mathematical Optimization Theory and Operations Research

18th International Conference, MOTOR 2019
Ekaterinburg, Russia, July 8–12, 2019
Revised Selected Papers

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ISSN 1865-0929 ISSN 1865-0937 (electronic)
Communications in Computer and Information Science
ISBN 978-3-030-33393-5 ISBN 978-3-030-33394-2 (eBook)
<https://doi.org/10.1007/978-3-030-33394-2>

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The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

This volume contains the refereed and selected papers presented at the 18th International Conference on Mathematical Optimization Theory and Operations Research (MOTOR 2019) (<http://motor2019.uran.ru>) held during July 8–12, 2019, in the picturesque Obukhovky resort near Ekaterinburg, Russia. This scientific forum brought together a wide research community in the fields of mathematical programming and global optimization, discrete optimization, complexity theory and combinatorial algorithms, optimal control and games, and their applications to relevant practical issues that require the use of operations research, mathematical economics, and data analysis.

The conference featured ten invited lectures:

- Prof. Olga Battaïa (ISAE-SUPAERO, France): “Decision Under Ignorance: A Comparison of Existing Criteria in a Context of Linear Programming”
- Prof. Oleg Burdakov (Linköping University, Sweden): “Node Partitioning and Cycles Creation Problem”
- Prof. Christoph Dürr (Sorbonne Université, France): “Bijective Analysis of Online Algorithms”
- Prof. Alexander Grigoriev (Maastricht University, The Netherlands): “A Survey on Possible and Impossible Attempts to Solve the Treewidth Problem via ILPs”
- Prof. Mikhail Kovalyov (United Institute of Informatics Problems NASB, Belarus): “No-Idle Scheduling of Unit-Time Jobs with Release Dates and Deadlines on Parallel Machines”
- Prof. Vadim Levit (Ariel University, Israel): “Critical and Maximum Independent Sets Revisited”
- Prof. Bertrand M. T. Lin (National Chiao Tung University, Taiwan): “An Overview of the Relocation Problem”
- Prof. Natalia Shakhlevich (University of Leeds, UK): “On a New Approach to Optimization Under Uncertainty”
- Prof. Angelo Sifaleras (University of Macedonia, Greece): “Exterior Point Simplex-Type Algorithms for Linear and Network Optimization Problems”
- Prof. Vitaly Strusevich (University of Greenwich, UK): “Design of Fully-Polynomial Time Approximation Schemes for Non-linear Boolean Programming Problems”

The following seven tutorials were given by the outstanding scientists:

- Prof. Tatjana Davidović (Mathematical Institute of the Serbian Academy of Sciences and Arts, Serbia): “Distributed Memory-Based Parallelization of Metaheuristic Methods”
- Prof. Stephan Dempe (TU Bergakademie Freiberg, Germany): “Bilevel optimization: The Model and its Transformations”

- Prof. Oleg Khamisov (Melentiev Energy Systems Institute SB RAS, Russia): “The Fundamental Role of Concave Programming in Continuous Global Optimization”
- Prof. Alexander Kononov (Sobolev Institute of Mathematics, Russia): “Primal-dual Method and Online Problems”
- Prof. Nenad Mladenovic (Mathematical Institute SANU, Serbia): “Solving Non-linear System of Equations as an Optimization Problem”
- Prof. Evgeni A. Nurminski (Far Eastern Federal University, Russia): “Projection Problems and Problems with Projection”
- Prof. Alexander Strekalovsky (Matrosov Institute for System Dynamics and Control Theory SB RAS, Russia): “Modern Methods of Non-convex Optimization”

MOTOR 2019 was a successor of the following well-known series of international and Russian conferences, which were previously organized in Ural, Siberia, and the Far East regions of the Russian Federation:

- Baikal International Triennial School Seminar on Methods of Optimization and Their Applications (BITSS MOPT) was established in 1969 by academician N. N. Moiseev; the 17th event in this series was held in 2017, in Buryatia (<http://isem.irk.ru/conferences/mopt2017/en/index.html>)
- All-Russian Conference on Mathematical Programming and Applications, (MPA) was established in 1972 by academician I. I. Eremin; the 15th conference in this series was held in 2015, near Ekaterinburg (<http://mpa.imm.uran.ru/96/en>)
- International Conference on Discrete Optimization and Operations Research, (DOOR) was organized nine times from 1996, and the most recent event was held in 2016 in Vladivostok (<http://www.math.nsc.ru/conference/door/2016/>)
- International Conference on Optimization Problems and Their Applications, (OPTA) has been organized regularly in Omsk since 1997, the 7th event in this series was held in 2018 (<http://opta18.oscsbras.ru/en/>)

Starting from different origins, today these conference series have grown very close to each other, having much in common in their research topics, scientific community, and organizers. Therefore, this year the united Program Committee (PC) decided to organize a joint meeting inheriting the long history of all the events and to call it the 18th International Conference on Mathematical Optimization Theory and Operations Research (MOTOR). This name will be given to the subsequent conferences of the chain, and the 19th MOTOR conference will take place in July 2020 at some beautiful place near Novosibirsk, Russia.

Following the tradition, the main conference scope includes but is not limited to mathematical programming, bi-level and global optimization, integer programming and combinatorial optimization, approximation algorithms with theoretical performance guarantees and approximation schemes, heuristics and meta-heuristics, optimal control and game theory, optimization problems in function approximation, optimization in machine learning and data analysis, and valuable practical applications to operations research and economics.

In response to the call for papers, MOTOR 2019 received 232 submissions. Out of 170 full papers considered for reviewing (62 abstracts and short communications were excluded because of formal reasons), 48 papers were selected by the PC for publication

in the first volume of proceedings (published in Springer LNCS, Vol. 11548). Out of the remaining submissions the PC selected 44 revised papers for publication in this volume. Thus, the acceptance rates for the two volumes are about 28% and 36% respectively. Each submission was reviewed by at least three PC members or invited reviewers, experts in their fields, in order to supply detailed and helpful comments.

We would like to thank all the authors for their submissions, as well as all members of the PC and external reviewers for their efforts in providing exhaustive reviews. We thank our sponsors, the Russian Foundation for Basic Research, Higher School of Economics (Campus Nizhny Novgorod), Ural Federal University, and Novosibirsk State University. In addition, we are grateful to Alfred Hofmann, Aliaksandr Birukou, Anna Kramer, and their colleagues from Springer LNCS and CCIS editorial board for their kind and helpful support.

September 2019

Igor Bykadorov
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