Yury Kochetov
Michael Khachay
Anton Eremeev
Panos Pardalos (Eds.)

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24th International Conference, MOTOR 2025
Novosibirsk, Russia, July 7–11, 2025
Proceedings

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Yury Kochetov · Michael Khachay ·
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Editors

Mathematical Optimization Theory and Operations Research

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Editors
Yury Kochetov
Sobolev Institute of Mathematics
Novosibirsk, Russia

Anton Eremeev
Dostoevsky Omsk State University
Omsk, Russia

Michael Khachay
Krasovsky Institute of Mathematics
and Mechanics
Yekaterinburg, Russia

Panos Pardalos
University of Florida
Gainesville, FL, USA

HSE University
Nizhny Novgorod, Russia

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Preface

This volume contains the refereed proceedings of the 24th International Conference on Mathematical Optimization Theory and Operations Research (MOTOR 2025)[1], held during July 07–11, 2025, in Novosibirsk Scientific Centre, Russia. This year the conference was held under the auspices of the *International Mathematical Center in Akademgorodok*.

The MOTOR conference unites several prominent events focused on mathematical programming, optimization, and operations research that have taken place in the Urals, Siberia, and the Russian Far East over the years. Earlier conferences in the MOTOR series were hosted in Omsk, Yekaterinburg, Irkutsk, and Petrozavodsk.

As per tradition, the main conference scope included, but was not limited to, mathematical programming, discrete optimization, computational complexity and approximation algorithms, metaheuristics and local search methods, game theory, optimization in machine learning and data analysis, parallel computations to speed up the solution of optimization problems, and applications in operations research and mathematical economics.

In response to the call for papers, MOTOR 2025 received 163 submissions. Out of 72 full papers considered for review (91 abstracts and short communications were excluded for formal reasons) only 27 papers were selected by the Program Committee (PC) for publication in this volume. Each submission was single-blind reviewed by at least three PC members or invited reviewers, experts in their fields, in order to supply detailed and helpful comments and evaluation.

The conference featured eight invited lectures:

– Eduardo Uchoa, Universidade Federal Fluminense, Brazil
  Optimizing with Column Generation

– Yury Dorn, AI Institute, Moscow State University, Russia
  Multi-armed bandits and applications: A survey

– Konstantin Vorontsov, Moscow Institute of Physics and Technology, Russia
  Optimization on unit simplices with applications to monotonic neural networks, non-negative matrix factorization and probabilistic topic modeling

– Saeid Alikhani, Yadz University, Iran
  2-Restricted Optimal Pebbling Number

– Panos M. Pardalos, University of Florida, USA; HSE, Nizhny Novgorod, Russia)
  Computational Approaches for Solving General Systems of Nonlinear Equations

[1] http://math.nsc.ru/conference/motor/2025/.

– Vassili Kolokoltsov, Moscow State University, Russia
Stochastic modelling for fighting with invasive insects and plants

– Guochuan Zhang, Zhejiang University, China
Interdiction: A bilevel combinatorial optimization problem

– Alexander Kostochka, University of Illinois Chicago, USA
Equitable coloring of graphs and its variations

and three Tutorial lectures:

– Igor Konnov, Kazan Federal University, Russia
Selection of Approaches for Multicriterial Optimization Problems

– Nikolai Zolotykh, Lobachevsky University of Nizhni Novgorod, Russia
How many vertices and faces can an integer linear programming polyhedron have?

– Andrei Vesnin, Sobolev Institute of Mathematics, Russia
Spatial graphs, their invariants and applications

A special *Round Table* session for business applications was organized to improve communication between the academic and industrial communities. Two main presentations were invited:

– Alexey Chernov, LLC «Quantum Algorithms and Optimization», Russia
QORETEX solver for MILP

– Zhang Dong, Operations Research and Mathematical Optimization Lab, Shenzhen, China
Large Scale Optimization for Complex Delivery Systems

Traditionally, the MOTOR conference holds a competition aimed at solving industrial problems presented in the form of challenges. Conference participants offer their creative solutions to real industrial problems. At the closing session, the main results and the winners of the competition are announced.

We thank the authors for their submissions, members of the Program Committee, and all the external reviewers for their efforts in providing exhaustive reviews. We thank our sponsors and partners: Mathematical Center in Akademgorodok (Novosibirsk), Novosibirsk State University, the Higher School of Economics (Nizhny Novgorod), and BIA Technologies. We are grateful to the staff of Springer LNCS for their kind and helpful support.

July 2025

Yury Kochetov
Michael Khachay
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