23rd Symposium on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems

ATMOS 2023, September 7–8, 2023,
Amsterdam, The Netherlands

Edited by

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Preface

Running and optimizing constantly evolving transportation systems requires careful mathematical modelling and gives rise to new, complex, and large-scale optimization problems. Tackling such problems requires, from a computational viewpoint, the definition of innovative, scalable solution techniques and the continuous search for new ideas from mathematical optimization, theoretical computer science, algorithmics, and operations research. Since the 2000s, the series of Algorithmic Approaches for Transportation Modelling, Optimization, and Systems (ATMOS) symposia represents a well established series of meetings that brings together researchers and practitioners who are interested in all aspects of algorithmic methods and models for transportation optimization, providing a forum for the exchange and dissemination of new ideas and techniques to handle all modes of transportation.

The 23rd Symposium on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems (ATMOS 2023) has been held, as usual, as part of ALGO 2023, the major annual European event for researchers, students and practitioners in algorithms, hosted by the Centrum Wiskunde & Informatica (CWI) in Amsterdam, the Netherlands, on September 7-8, 2023. Topics of interest were all optimization problems, models and algorithmic techniques related to transportation systems including, but not limited to, congestion modelling and reduction, crew and duty scheduling, demand forecasting, delay management, design of pricing systems, electromobility, infrastructure planning, intelligent transportation systems, models for user behaviour, line planning, mobile applications for transport, mobility-as-a-service, multi-modal transport optimization, routing, platform assignment, route planning in road and public transit networks, rostering, timetable generation, tourist tour planning, traffic guidance, and vehicle scheduling. Of particular interest were papers applying and advancing the following techniques: algorithmic game theory, algorithm engineering, approximation algorithms, combinatorial optimization, graph and network algorithms, heuristics and metaheuristics, mathematical programming, methods for the integration of planning stages, online algorithms, simulation tools, stochastic and robust optimization.

We received in total thirty six submissions from all over the world, twenty six of them being regular submissions, the other ten being short submissions. All manuscripts were reviewed by at least three PC members, and evaluated on originality, technical quality, and relevance to the topics of the symposium. Based on the reviews, the program committee selected eighteen submissions (fourteen regular papers, and four short papers) to be presented at the symposium, which are collected in this volume in the same order they are presented at the symposium. Together, they quite remarkably demonstrate the wide applicability of algorithmic optimization to transportation problems. In addition, Christos Zaroliagis (University of Patras and Computer Technology Institute, Patras, Greece) kindly agreed to complement the program with an invited talk titled "Time-Dependent Route Planning: Theory & Practice" that was presented as a keynote talk of ALGO 2023.

We would like to thank the members of the Steering Committee of ATMOS for giving us the opportunity to serve as Program Chairs of ATMOS 2023, all the authors who submitted papers, the members of the Program Committee and the additional reviewers for their valuable work in selecting the papers appearing in this volume, Christos Zaroliagis for accepting our invitation to present an invited talk, as well as Solon Pissis (Chair of the ALGO 2023 Organizing Committee) and his team at CWI for hosting the symposium as

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part of ALGO 2023. We also acknowledge the use of the EasyChair system for the great help in managing the submission and review processes, and Schloss Dagstuhl for publishing the proceedings of ATMOS 2023 in its OASIcs series.

Finally, we are pleased to announce that, based on the program committee's reviews and decisions, authors Akira Matsubayashi and Yushi Saito have been awarded this year's "Best Paper Award of ATMOS 2023" with their paper titled "A Faster Algorithm for Recognizing Directed Graphs Invulnerable to Braess's Paradox".

August 2023

Daniele Frigioni and Philine Schiewe

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