18th Workshop on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems

ATMOS 2018, August 23–24, 2018, Helsinki, Finland

Edited by
Ralf Borndörfer
Sabine Storandt

OASICS

OASIcs – Vol. 65 – ATMOS 2018 www.dagstuhl.de/oasics

Editors

Ralf Borndörfer
Zuse Institute Berlin/Freie Universität Berlin
Berlin
Germany
borndoerfer@zib.de

Sabine Storandt
Universität Würzburg
Würzburg
Germany
storandt@informatik.uni-wuerzburg.de

ACM Classification 2012
Theory of computation → Design and analysis of algorithms, Mathematics of computing → Discrete mathematics, Mathematics of computing → Combinatorics, Mathematics of computing → Graph Theory, Mathematics of computing → Mathematical optimization, Applied computing → Transportation

ISBN 978-3-95977-096-5

Published online and open access by
Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH, Dagstuhl Publishing, Saarbrücken/Wadern, Germany. Online available at http://www.dagstuhl.de/dagpub/978-3-95977-096-5.

Publication date
August, 2018

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de.

License
This work is licensed under a Creative Commons Attribution 3.0 Unported license (CC-BY 3.0): http://creativecommons.org/licenses/by/3.0/legalcode.
In brief, this license authorizes each and everybody to share (to copy, distribute and transmit) the work under the following conditions, without impairing or restricting the authors' moral rights:
- Attribution: The work must be attributed to its authors.

The copyright is retained by the corresponding authors.

Digital Object Identifier: 10.4230/OASIcs.ATMOS.2018.0

Contents

Preface
Ralf Borndörfer and Sabine Storandt 0:vii

ATMOS'18 Best VGI Paper Award

Reformulations for Integrated Planning of Railway Traffic and Network Maintenance
Tomas Lidén 1:1–1:10

Railway Optimization

Large Scale Railway Renewal Planning with a Multiobjective Modeling Approach
Nuno Sousa, Luís Alçada-Almeida, and João Coutinho-Rodrigues 2:1–2:9

Robust Optimization

How to Measure the Robustness of Shunting Plans
Roel van den Broek, Han Hoogeveen, and Marjan van den Akker 3:1–3:13

Robustness as a Third Dimension for Evaluating Public Transport Plans
Markus Friedrich, Matthias Müller-Hannemann, Ralf Rückert, Alexander Schiewe, and Anita Schöbel 4:1–4:17

Fast Robust Shortest Path Computations
Christoph Hansknecht, Alexander Richter, and Sebastian Stiller 5:1–5:21

Timetabling & Line Planning

Tree Decomposition Methods for the Periodic Event Scheduling Problem
Irving van Heuven van Staereling 6:1–6:13

A Bilevel Approach to Frequency Optimization in Public Transportation Systems
Agustín Arizti, Antonio Mauttone, and María E. Urquhart 7:1–7:13

Cost-Minimal Public Transport Planning
Julius Pätzold, Alexander Schiewe, and Anita Schöbel 8:1–8:22

Individual Traffic

Changing Lanes on a Highway
Thomas Petig, Elad M. Schiller, and Jukka Suomela 9:1–9:15

Parameterized Algorithms and Data Reduction for Safe Convoy Routing
René van Bevern, Till Fluschnik, and Oxana Yu. Tsidulko 10:1–10:19

18th Workshop on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems (ATMOS 2018).
Editors: Ralf Borndörfer and Sabine Storandt
OpenAccess Series in Informatics
OASICS Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany

A Neighborhood Search and Set Cover Hybrid Heuristic for the Two-Echelon Vehicle Routing Problem
Youcef Amarouche, Rym N. Guibadj, and Aziz Moukrim 11:1–11:15

Game Theory

Multi-Source Multi-Sink Nash Flows over Time
Leon Sering and Martin Skutella 12:1–12:20

Oligopolistic Competitive Packet Routing
Britta Peis, Bjoern Tauer, Veerle Timmermans, and Laura Vargas Koch 13:1–13:22

Vehicle Scheduling

The Path&Cycle Formulation for the Hotspot Problem in Air Traffic Management
Carlo Mannino and Giorgio Sartor 14:1–14:11

Vehicle Scheduling Based on a Line Plan
Rolf N. van Lieshout and Paul C. Bouman 15:1–15:14

ATMOS'18 Best Paper Award

A Simple Way to Compute the Number of Vehicles That Are Required to Operate a Periodic Timetable
Ralf Borndörfer, Marika Karbstein, Christian Liebchen, and Niels Lindner 16:1–16:15