# 9th Workshop on Algorithmic Approaches for Transportation Modeling, Optimization, and Systems

**ATMOS 2009, September 10, 2009, Copenhagen, Denmark**

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*ACM Classification 1998*
F.2 Analysis of Algorithms and Problem Complexity, G.1.6 Optimization, G.2.2 Graph Theory, G.2.3 Applications

**ISBN 978-3-939897-11-8**

*Published online and open access by*
Schloss Dagstuhl – Leibniz-Center for Informatics GmbH, Dagstuhl Publishing, Saarbrücken/Wadern, Germany.

*Publication date*
November, 2009.

*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.

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Digital Object Identifier: 10.4230/OASIcs.ATMOS.2009.i

**ISBN 978-3-939897-11-8** **ISSN 2190-6807** **http://www.dagstuhl.de/oasics**

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**ISSN 2190-6807**

**www.dagstuhl.de/oasics**

# ATMOS 2009 Preface: Algorithmic Approaches for Transportation Modeling, Optimization, and Systems

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The 9th ATMOS workshop was held in Copenhagen, September 10, 2008, within ALGO, an annual meeting combining European algorithms conferences and workshops. The past workshops of ATMOS were held in Heraklion in 2001, Malaga in 2002, Budapest in 2003, Bergen in 2004, Palma de Mallorca in 2005, Zürich in 2006, Sevilla in 2007, and Karlsruhe in 2008.

The ALGO web page states: "An important area of algorithms, called combinatorial optimization, is concerned with finding solutions to solving problems that arise in logistics and planning. ATMOS, one of the conferences hosted by ALGO, focuses specifically on transportation: how to schedule trains so as to minimize the number of trips with empty cars, or how to pack containers into a ship. Such questions are solved with the aid of computers, and algorithms are responsible for computing the solution. Better algorithms solve the same problem using fewer trains, pack more containers per trip, or find routes that consume less fuel".

ATMOS represents a well established series of meetings between algorithms researchers and practitioners who are interested in all aspects of algorithmic methods and models for transportation optimization and provides a forum for the exchange and dissemination of new ideas and techniques. In the last years the scope of the workshop has been broadened to comprise all modes of transportation. Scheduled transportation networks give rise to very complex and large-scale network optimization problems requiring innovative solution techniques and ideas from mathematical optimization and theoretical computer science. Applicable tools and concepts include those from graph and network algorithms, combinatorial optimization, approximation and online algorithms, stochastic and robust optimization.

Of particular interest are the following areas:

- Infrastructure Planning
- Line Planning
- Timetable Generation
- Routing and Platform Assignment
- Vehicle Scheduling
- Crew and Duty Scheduling

J. Clausen, G. Di Stefano (Eds): ATMOS 2009
9th Workshop on Algorithmic Approaches for Transportation Modeling, Optimization, and Systems
http://drops.dagstuhl.de/opus/volltexte/2009/2294

- Rostering
- Demand Forecasting
- Design of Tariff Systems
- Maintenance and Shunting of Rolling Stock
- Delay Management
- Rolling Stock Rescheduling
- Simulation Tools for Railway Operations
- Timetable Information

More generally, ATMOS aims at communicating the successful integration of several of these subproblems or planning stages, algorithms operating in an online/realtime or stochastic setting, and heuristic or approximate algorithms for real-world instances.

Twelve paper were submitted for ATMOS 2009, and nine of them were selected for presentation and inclusion in the current volume. The reviewing process was guided by the program committee consisting of

- Serafino Cicerone, University of L'Aquila, Italy
- Jens Clausen, Technical University of Denmark, (Chair)
- Gabriele Di Stefano, University of L'Aquila, Italy (Chair)
- Michel Gendreau, Université de Montréal, Canada
- Riko Jacob, Technical University Mnchen, Germany
- Julie Jespersen Groth, DSB S-tog, Denmark
- Leo Kroon, RSM Erasmus University and Netherlands Railways, The Netherlands
- Gilbert Laporte, HEC Montral and GERAD, Canada
- Juan A. Mesa, University of Sevilla, Spain
- Anita Schöbel, University of Goettingen, Germany
- Martin Skutella, Technical University Berlin, Germany
- Paolo Toth, University of Bologna, Italy
- Gerhard J. Woeginger, Eindhoven University of Technology, The Netherlands
- Christos Zaroliagis, CTI and University of Patras, Greece

We wish to thank the program committee for the care in selecting the best papers and all the external referees for their help.

Our special thanks goes to Dorothea Wagner for accepting to be the invited speaker of ATMOS and for giving an inspiring talk on "Algorithm Engineering for Route Planning in Realistic Scenarios ", showing fundamental results of more than ten years of researches in the field of shortest paths algorithms and route planning.

Finally, we thank the organizer Thore Husfeldt, for his professional management, all the members of the ALGO organizing committee, the editors of

the Dagstuhl Seminar Proceedings for accepting the publication of this volume within DROPS, and all the participants for their lively interaction at the ATMOS sections.

Copenhagen and L'Aquila, November 2009

Jens Clausen and Gabriele Di Stefano