



ODS2023

INTERNATIONAL CONFERENCE on
OPTIMIZATION and DECISION SCIENCE
Ischia (Italy) September 4th - September 7th - 2023

ODS2023 - Book of Abstracts
The ODS2023 Organizing Committee
August, 2023

This is the book of the abstracts accepted and then presented during the International Conference on Optimization and Decision Science, ODS2023, held in Ischia from September 4th to September 7th, 2023.

ODS2023 is organized within the *Italian Operations Research Society* (AIRO), with the support of the Department of Mathematics and Applications “Renato Caccioppoli” of University of Napoli Federico II.

ODS 2023 gives a special focus on the theme *Optimization in Green Sustainability and Ecological Transition* because we believe that the recent climate change requires operations researchers to think about how mathematical optimization models and methods can support a more environmentally sustainable world.

The book contains more than 250 abstracts, 33 of which associated to papers accepted for publication in the AIRO Springer Series volume devoted to the conference.

This year, in the context of the stream *OPTSM Optimization in Public Transport and Shared Mobility*, ODS 2023 also hosts the *4th International Workshop on Artificial Intelligence for RAILwayS*. In particular, on September 4th, five sessions are devoted to the contributions of the workshop.

From September, 5th, the ODS2023 contributions are organized into five parallel streams. In total, ODS2023 has about 45 sessions, 20 of which are invited sessions.

Finally, three plenary sessions, given by worldrenowned researchers, enrich the scientific part of ODS2023.

The remaining part of the present book contains, day by day, session by session, the detailed abstracts with information about the authors and their affiliations.

The ODS 2023 Organizing Committee

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Vehicle Routing I

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Strengthened Integer Programming Formulations for the Fleet Quickest Routing Problem on Grids

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Abstract This paper is concerned with the problem of finding collisionfree, nonstop Manhattan paths for a set of vehicles that move on a grid, each from a node on the bottom row to the top of the destination column; in particular, we are interested in minimising the number of rows that allow such routing. This problem is known as the Fleet Quickest Routing Problem on Grids. We propose an Integer Linear Programming formulation, introduce some valid inequalities and present a reduced-size model, based on the analysis of vehicle movements on the grid. Computational tests, performed on random benchmarks, show the impact of inequalities on the proposed formulation and that reducing the size of the formulation results in better performances for some classes of instances.

Keywords: Collision-free routing, Grid graphs, Integer Linear Programming, Valid inequalities