
ODS 2022
INTERNATIONAL CONFERENCE ON
OPTIMIZATION AND DECISION SCIENCE
FIRENZE (ITALY) August 30th - September 2nd - 2022

ODS2022 – Book of abstracts

the ODS2022 Organizing committee

August 2022

This book contains all of the abstracts accepted for presentation at the International Conference on Optimization and Decision Science, ODS2022, held in Florence from August 30^{th} to September 2^{nd}, 2022. The conference is organized within AIRO, the Italian Operations Research Society, with the support of DINFO (Dept. of Information Engineering, Università degli Studi di Firenze). The conference theme is open in the fields of operations research, optimization, problem solving and decision making, and their applications. A special focus is on the theme "Operations Research: inclusion and equity".

The book of abstracts contains over 230 contributions, 30 of which associated to papers accepted for publication in the AIRO Springer Series volume devoted to the conference. The contributions are organized into 5 parallel streams and about 35 sessions, 14 of which are invited sessions/streams. Four plenary sessions enrich the scientific part of the conference; they are given by world-renowned professors, and they are related to extremely topical and important issues, namely the use of quantitative analytical methods to promote equality and equity, in the many facets that these terms may have. Abstracts are listed day by day, session by session.

The ODS 2022 Organizing Committee

TH 16:40 PM1 Audtorium A

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

In an automated transportation system, a fleet of vehicles moves on a grid, each from its starting point on one side, to its destination on the opposite side. For the sake of efficiency, the only allowed routes are nonstop shortest paths. Among these, one route for each vehicle has to be properly chosen, avoiding that two vehicles cross the same node or move on the same edge at the same time. Therefore, an assignment of origin-to-destination nonstop collision-free shortest path routes is required. The Fleet Quickest Routing Problem on Grids aims at finding the minimum number of grid lanes allowing for such an assignment. We present two Integer Linear Programming models that exploit some combinatorial properties of conflicting shortest paths: the first one has binary variables and refines a multicommodity flow formulation; the second one exploits a compact representation of shortest paths with a reduced number of integer variables. We compare the two formulations through test on random and on purpose generated instances, showing the better performance of the compact formulation, and we discuss their potential towards more efficient methods.