

VOR träge zum Operations Research

Kolloquium des Instituts für Operations Research

Zeit: Mittwoch, 27.05.2026, 16:00-18:00 Uhr

Ort: **Raum 5A-09, Gebäude 05.20**

Es sprechen: Prof. Dr. Justo Puerto Albandoz
Professor, Facultad Matematicas, University of Sevilla and IMUS

Prof. Dr. Juan José Salazar González
Chair of the Department of Mathematics, Statistics and Operational
Research, Universidad de La Laguna

Zu den Themen:

Ordered optimization: theory and applications

Justo Puerto Albandoz

Ordered measures provide a powerful and flexible modeling paradigm, including a wide range of objectives such as fairness indices, risk and robustness criteria, among other aggregation operators. Despite their relevance, their integration into optimization models remains challenging, since ordering operations cannot be decoupled and must be embedded directly into the decision process. In this paper, a unified optimization framework is introduced for the computation and optimization of a broad class of ordered measures within a single algebraic structure. The proposed framework covers linear, quadratic, and nested ordered measures, yielding compact and strengthened mixed integer formulations that generalize many existing models. Structural properties and modeling trade-offs arising from different representations of ordering constraints are discussed. An extensive computational study is conducted to compare the alternative formulations. Finally, the versatility of the proposed framework is illustrated by integrating ordered measures into some representative optimization problems, namely quantile regression, robust scenario aggregation, Traveling Salesman Problem, and Weighted Set Covering Problem. These applications demonstrate how ordered measures can be systematically embedded into complex optimization models without ad hoc reformulations.

Mathematical Programming to solve optimal area polygonisation problems

Juan José Salazar González

This talk will describe approaches to finding the maximum- and minimum-area polygons within a given set of points in the Euclidean plane. Both problems are NP-hard and of interest in Computational Geometry. They have been extensively studied, though only recent literature provides mathematical formulations that consistently find optimal solutions to instances from a benchmark collection with up to 25 points. We present and compare eight new Mixed Integer Linear Programming models for the two problems. Four represent a polygon as a solution to the Asymmetric Travelling Salesman Problem, while the other four use the Symmetric Travelling Salesman Problem representation. Six of the models compute the area of a polygon by selecting triangles, while the other two select subpolygons. A computational analysis of the benchmark collection shows that one of our new formulations consistently solves all benchmark instances with up to 50 points. The success of our proposal is a linear system to select a triangulation of the point set, a partition of the triangulation to cover the internal and external area of a polygon, and a representation of the polygon as the solution of an Asymmetric Travelling Salesman Problem. Talk based on <https://doi.org/10.1016/j.ejor.2025.08.023>

Die Vorträge zum Operations Research wenden sich an alle Interessierten!

Bei Rückfragen wenden Sie sich bitte an:
Prof. Dr. Stefan Nickel, Institut für Operations Research