

**WISDOM presents YoungWomen4OR in:**

**“Learning, Fairness and Sustainability”**

**Join us for a coffee and a chat!**

**What:** EURO WISDOM Forum YoungWomen4OR Talks<sup>1</sup>

**Where:** Zoom – Register here <https://forms.gle/uJVEUyE2vTCw1twZ6> to receive the Zoom link -  
The webinar will be recorded and made available on the [EURO WISDOM YouTube channel](#).

**When:** Friday November 17, 2023, 16:00 – 17:00 (Central European Time)

**Webinar Format**

- Introductions/Webinar etiquette – Prof Dolores Romero Morales - 5 mins
- Learning, Fairness and Sustainability – YoungWomen4OR Talks - each 10 mins:
  - *Learning to select operators in meta-heuristics using machine learning* - Dr Maryam Karimi Mamaghan, The Netherlands;
  - *Ensuring a Socially Fair and Economically Inclusive Gig & Sharing Economy* - Dr Xishu Li, The UK;
  - *Bilevel optimization in energy market participation* - Dr Mirna Gržanić, Croatia;
- Meeting the challenges - Overview/Current Challenges, synergies with existing work
  - Prof Emilio Carrizosa - 15 minutes
- Moderated open discussion with Coffee and Networking – 10 minutes

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<sup>1</sup> WISDOM is a forum to support, empower, and encourage the participation of all genders in Operational Research and Management Science. It is an initiative supported by EURO, the Association of European Operational Research Societies. Please visit: <https://www.euro-online.org/web/pages/1654/wisdom>

## YoungWomen4OR Speakers



**Dr Maryam Karimi Mamaghan**, Vrije Universiteit Amsterdam, The Netherlands

**Title:** Learning to select operators in meta-heuristics using machine learning

**Abstract:** This work presents a generic framework to integrate Q-learning, as a reinforcement learning technique, into meta-heuristic algorithms for the purpose of operator selection (local search, perturbation, ...). When designing meta-heuristics with multiple search operators, a major question arises: in which order should the search operators be employed to efficiently guide the meta-heuristic toward the optimal solution? The proposed framework answers this question by selecting the best operator in an online manner based on the

historical performance of the operators (adaptive operator selection). Through an application to the permutation flowshop scheduling problem, we show the outperformance of the proposed framework in terms of optimality gaps, convergence rate, and computational overhead comparing to the state-of-the-art.



**Dr Xishu Li**, The University of Birmingham, The UK

**Title:** Ensuring a Socially Fair and Economically Inclusive Gig & Sharing Economy

**Abstract:** The primary objective of this research is to explore ways to create a labor market that is fair, just, and accessible to all participants, while also promoting economic opportunities and benefits for workers. With a particular emphasis on trust among suppliers, buyers, and companies, as well as fairness concerns for each player, my research addresses three key questions. First, I explore the one-time contracting process within share-based

platforms, focusing on the extent of information disclosure and the proportion of revenue shared with suppliers. The second research question expands the analysis to a repeated-game setting, examining the optimal long-term information sharing and revenue sharing strategies for a gig-based platform. The third research question incorporates all three key players involved in the platform economy---the platform, the supplier, and the buyer---to analyze the drivers of trust and trustworthiness on each side of the platform and explores the dynamics of trust-building among the three players. By addressing these questions, I aim to provide insights into the design of effective labor market mechanisms that promote transparency and cooperation within the gig & sharing economy. I also aim to make a significant contribution to the field of contracting theory and the examination of emerging economic models. Specifically, I aim to establish the critical role of trust and fairness in shaping the operational dynamics of platforms. In terms of methodology, I have adopted a multi-methodological approach in these projects. I integrated game theory, (partially observable) Markov decision process, and simulation techniques to capture the complexity and dynamics of labor supply in these sectors. Additionally, I incorporated behavioral and field experiments as complements to the quantitative methods, allowing for a deeper understanding of the potential value of our model. It is worth noting that while machine learning, optimization, and simulation methods are often viewed as distinct from behavioral science, my research emphasizes their complementary nature in solving crucial operations management problems.



**Dr Mirna Gržanić**, University of Zagreb, Croatia

**Title:** Bilevel optimization in energy market participation

**Abstract:** This presentation is focused on an innovative coordination model between flexible final customers and an aggregator in providing flexibility service to the Distribution System Operator called Coordination Via Aggregator (CVA). The problem is formulated as a stochastic two-stage bilevel model in which the leader acts as both the aggregator and the supplier and maximizes its profit by determining the price signal for flexible final customers composed of energy-based component and the incentive for service provision. Final users, modeled as followers in the lower level of the model, minimize their costs following the price signal from the upper level. The

aggregator in this model is a non-zero-profit market entity, i.e., the price determined by the aggregator covers the balancing costs, the energy supply costs and at the same time incentivizes flexible customers to adequately change their consumption patterns. The CVA results are compared with the Direct Service Activation (DSA) approach in which final customers have a predefined two-tariff pricing option and receive a fixed amount of annual network charges discount for participating in the direct load control program. Optimal power flow model in distribution network is modelled in small-scale and medium scale distribution networks distinguishing final users with different flexibility profiles and low-carbon technology portfolio participating in demand response programs.



**Subject Matter Expert: Emilio Carrizosa** is Full Professor of Statistics and Operations Research in the University of Seville, Spain. His main research interests are Machine Learning (addressed from an Operations Research perspective) and Industrial and Applied Mathematics. His research has been published in OR&MS journals such as Operations Research, Mathematical Programming, Management Science, Mathematics of Operations Research, Omega, European Journal of Operational Research, or Computers & OR. Moreover, due to his interdisciplinary research, he has also published in disciplines beyond OR: Statistics and Probability, Energy, Chemical Engineering or

Hydrology. He has (Scopus: 18.10.23) 147 publications with 1,848 citations (819 in the period 2019-2023), yielding an h-index 25. He has supervised 14 PhD Theses, three of them awarded with various national and international prizes. He is involved in Transfer of Knowledge activities. He is President of math-in, the Spanish Network of Industrial Mathematics (2021-) and President of PET MSO-ED, the Spanish Platform for Technologies of Modelling, Simulation and Optimization in a Digital Environment (2023-). He has been leading researcher in industrial projects and contracts in applications of OR to different sectors: Energy, Health, Logistics and Information Technologies. Since 2022, he is Scientific Advisor of the OR-AI company OGA. He has served as Director of IMUS, the Mathematical Institute of the University of Seville, President of SEIO, the Spanish Statistics and OR Society, and has been Editor-in-Chief of TOP, the Spanish OR journal. He has an intense activity of outreach, participating in debates and interviews in tv, radio and newspapers on industrial mathematics and teaching mathematics.