

# IO2025 | Scientific Program

## Day 1 – Sunday Sept. 7th

Location: [Amarante Cine-teatro. Av. Gen. Silveira, 4600-758 Amarante](#)

**Sunday 15:30 - 16:15**

### Opening Session (Auditorium)

**Sunday 16:15 - 17:15**

### The EURO Plenary (Auditorium)

Chair: Isabel Gomes

Language: English.

- **Maria Paola Scaparra:** *Using OR to tackle health and climate challenges in the Global South*

## Day 2 – Monday Sept. 8th

Location: [Escola Secundária de Amarante. Avenida General Vitorino Laranjeira 592, 4600-018 Amarante](#)

### Parallel Sessions Outline:

|                      | Room 1                             | Room 2                           | Room 3                                 | Room 4                                     | Room 5                           |
|----------------------|------------------------------------|----------------------------------|----------------------------------------|--------------------------------------------|----------------------------------|
| <b>9:15 - 10:00</b>  | 1.1<br>Optimization-Simulation     | 1.2<br>OR in Energy 1            | 1.3<br>Scheduling and transportation   | 1.4<br>SPE Session on Statistics           | 1.5<br>Education                 |
| <b>10:15 - 11:00</b> | 2.1<br>Transportation              | 2.2<br>OR with Social Impact     | 2.3<br>Scheduling                      | 2.4<br>Bilevel optimization                | 2.5<br>AI and OR in healthcare   |
| <b>11:30 - 12:30</b> | 3.1<br>Optimization in networks    | 3.2<br>OR in waste management    | 3.3<br>Retail and sales                | 3.4<br>Artificial Intelligence and OR      | 3.5<br>Data Envelopment Analysis |
| <b>14:15 - 15:15</b> | 4.1<br>Transportation and Delivery | 4.2<br>Sustainable supply chains | 4.3<br>Teams management and scheduling | 4.4<br>Operations management and logistics |                                  |
| <b>15:60 - 16:30</b> | 5.1<br>Vehicle routing             | 5.2<br>OR in Energy 2            | 5.3<br>Hard optimization problems      | 5.4<br>Optimization with uncertainty       |                                  |

**Monday 9:15 - 10:00**

### Session 1.1 - Optimization-Simulation (Room 1)

Chair: José Valério de Carvalho

Language: English. Portuguese

- Mariana Camarneiro; Bruno S. Gonçalves; Samuel Moniz; **Miguel Vieira**; Catia da Silva: *A hybrid optimization-simulation framework for sustainable closed-loop supply chains design and planning*
- **Armando Dauer**; Teresa Galvão; Jorge Pinho de Sousa; Bruno Prata: *An Optimisation and Simulation Approach for the Design of Demand Responsive Transport Services*
- Raquel Bernardino; **Daniel Santos**; Filippo Visintin: *Optimization-Simulation approach for the vehicle routing problem with time windows and synchronized visits under travel and service time uncertainty*

### Session 1.2 - OR in Energy 1 (Room 2)

Chair: Carlos Henggeler Antunes

Language: English

- **Ricardo Pinto de Lima**; Antonio Conejo; Gonzalo Constante-Flores; Omar Knio: *An effective hybrid decomposition approach to solve the network-constrained stochastic unit commitment problem in large-scale power systems*
- **Linda Canales Bustos**; Ana Barbosa-Póvoa: *Towards energy transition in the mining supply chain*
- Luciana Yamada; **Flávia Barbosa**; Luís Guimarães: *Optimizing Hybrid Renewable Energy with Tidal and Offshore Wind in the Mersey Estuary*

### Session 1.3 - Scheduling and transportation (Room 3)

Chair: Jorge Pinho de Sousa

Language: English. Portuguese

- Catarina M. Marques; **José Luís Moreira**; Jorge Pinho de Sousa: *Improving efficiency in Container Terminals through Coordinated Truck Scheduling: a Heuristic-based Approach*
- **Ana Carvalho**; Ricardo Pereira; Rita Portugal; Ricardo Saldanha: *Rolling stock rotation planning in a regular operation context*
- **Catarina Carvalho**; Catarina M. Marques; Jorge Pinho de Sousa: *Enhancing Port Efficiency and Sustainability through Just-in-Time Arrivals and Tugboat Resource Management*

### Session 1.4 - SPE Session on Statistics (Room 4)

Chair: Luís Filipe Meira Machado

Language: English. Portuguese

- J.V.S. Loureiro; M. Fernanda P. Costa; S. Faria; C. Ribeiro; **Cecilia Coelho**: *An Hybrid Neural Network-Optimal Control Approach for Irrigation Scheduling Based on Satellite Data*
- **Flora Ferreira**; Estela Bicho; Letícia Cocato; Wolfram Erlhagen; Paulo Vicente: *Data-Driven Insights into Trust for Decision-Making in Social Robot Interaction*
- **Luís Filipe Meira Machado**: *Interval-Censored Survival Analysis with Continuous Covariates*

## Session 1.5 – Education (Room 5)

Chair: Paula Sarabando

Language: English. Portuguese

- Maria João Fernandes; Tiago Miguel; Manuel Reis; **Paula Sarabando**: *O Ensino da Investigação Operacional na Voz dos Alunos: Dificuldades, Motivações e Propostas de Melhoria*
- **Carla Lemos**, Lara Almeida; Jelise Cabral; Eliana Costa e Silva: *Aprender Otimização a Jogar: Relato de uma Experiência com o Burrito Optimization Game*
- Rogério Matias; **Tiago Miguel**; Manuel Reis; Paula Sarabando: *Hierarchical Analysis of Educational Strategies for Youth Financial Literacy Using the Analytic Hierarchy Process*

**Monday 10:15 - 11:00**

## Session 2.1 – Transportation (Room 1)

Chair: Beatriz Brito Oliveira

Language: English

- **João Pedro Lopes de Albuquerque**; António Ramos Andrade; Marta Castilho Gomes: *Transit Network Design and Frequency Setting with elastic demand: a mixed-integer linear programming approach*
- **Beatriz Brito Oliveira**; Selin Ahipasaoglu: *Enhancing carsharing pricing and operations through integrated choice models*
- **Sayeh Fooladi Mahani**; Masoud Golalikhani; Beatriz Brito Oliveira: *Integrating electric vehicles into urban car-sharing systems: addressing grid constraints and operational challenges for sustainable mobility*

## Session 2.2 - OR with Social Impact (Room 2)

Chair: Franklina Toledo

Language: English. Portuguese

- **Ana Bessa**; Inês Duarte; Ana Barbosa-Póvoa; Tânia Pinto Varela; Cristóvão Silva; Samuel Moniz: *Social welfare in a design and distribution problem*
- **Daniel Botelho**; Teresa Monteiro; Senhorinha Teixeira: *Epidemiological Modelling of Misinformation with Optimal Intervention Strategies*
- **Franklina Toledo**; Giulia Pereira Mendes: *Centro de Troca de Alimentos: um enfoque social*

## Session 2.3 – Scheduling (Room 3)

Chair: Gonçalo Figueira

Language: English. Portuguese

- **Nuno André Azevedo Marques**; Gonçalo Figueira; Luís Guardão; Luís Guimarães: *Learning Dispatching Rules for a Large-Scale Scheduling Problem of a Maintenance Provider*

- **Paulo Nascimento**; Samuel Moniz; Cristóvão Silva: *Efficient nesting via Fast Fourier Transforms to solve the production scheduling problem in Additive Manufacturing*
- **Alexandre Jesus**; Arthur Corrêa; Samuel Moniz; Cristóvão Silva: *Learning to schedule from demonstrations: What we lose by only imitating the best?*

## Session 2.4 - Bilevel optimization (Room 4)

Chair: Maria João Alves

Language: English. Portuguese

- **Maria Santos**; Pedro Amorim; Margarida Carvalho; Sara Martins: *A bilevel approach to enhance flexibility in retailer-supplier agreements for perishable products*
- **Maria João Alves**; Carlos Henggeler Antunes; Ana Soares; Inês Soares: *Uma abordagem de otimização em dois níveis para a agregação da flexibilidade no consumo de energia elétrica*
- **Ana Januário**; Maria João Alves; Carlos Henggeler Antunes: *A bilevel approach to hyperparameter optimization for a support vector machine classifier*

## Session 2.5 - AI and OR in healthcare (Room 5)

Chair: Ana Sara Costa Domingues

Language: English. Portuguese

- Salomé Azevedo; Maria Isabel Gomes; **Dulce Loureiro**: *Explainable Machine Learning For Healthcare Cost Optimization: A Time-Driven Approach*
- Mariana Oliveira; **Miguel Pereira**; José Figueira: *Predicting hospital efficiency through integrated Data Envelopment Analysis and machine learning*
- Beatriz Cagigal Gregório; Miguel Pereira; **Ana Sara Costa Domingues**: *Public hospitals five-star rating considering interactions in pairs of access and quality criteria*

**Monday 11:30 - 12:30**

## Session 3.1 - Optimization in networks (Room 1)

Chair: Maria Cândida Mourão

Language: English. Portuguese

- **Filipe Alvelos**; André Mendes: *Otimização da supressão de incêndios florestais*
- **Elsa Silva**; Filipe Pereira Alvelos: *Network-Based Resource Planning for Wildfire Management*
- **André Bergsten Mendes**; Miguel Cezar Santoro; Laura Bahiense; Elcio Ribeiro: *Patrolling Routes for the Amazonas River Navigation System*
- **Maria Cândida Mourão**; Raquel Bernardino; Cristina Requejo; Leonor Santiago Pinto: *Inspecting Electric Lines with Drones*

### Session 3.2 - OR in waste management (Room 2)

Chair: Tania Rodrigues Pereira Ramos

Language: English. Portuguese

- **Marta Castilho Gomes**; Fernando Braga; Joaquim Duque: *Nova abordagem para a otimização da gestão de resíduos de construção e demolição (com componente temporal)*
- **Simone Lima**; Maria João Santos: *Strategic decisions in the valorization of subproducts*
- Ygor Acácio; **Tania Rodrigues Pereira Ramos**: *From Blind Collection to Smart Routing: A Data-Driven Analysis of Waste Collection in Figueira da Foz*
- **Héctor Fabio Bonilla Bonilla Londoño**; Ana Paula Barbosa Póvoa; Tania Rodrigues Pereira Ramos: *Stochastic Waste Collection Routing with Profit: A two-stage framework*

### Session 3.3 - Retail and sales (Room 3)

Chair: Bernardo Almada-Lobo

Language: English. Portuguese

- **Pedro Amorim**; Sara Martins: *The introduction of online operations to brick-and-mortar grocery stores and its impact on spoilage*
- **Francisco Monteiro**; Diogo Bento; Joana Hora; Henrique Neto; Daniel Pereira; Pedro Schuller: *Forecast-Driven Sales and Operations Planning for Balancing Supply and Demand in the Rice Industry*
- **Sérgio Castro**; Bernardo Almada-Lobo; Gonçalo Figueira; Willem van Jaarsveld: *Balancing Fulfillment Costs with Vendor Goals: Optimizing Order Allocation in Online Marketplaces with Reinforcement Learning*
- Pedro Amorim; Dorothee Honhon; Sara Martins; Maria João Santos; **Mariana Sousa**: *Integrating perishables' short life into assortment optimization*

### Session 3.4 - Artificial Intelligence and OR (Room 4)

Chair: Luís Guimarães

Language: English. Portuguese

- **António Prata** Cardoso; Felipe Yamada; Flávia Barbosa; Luís Guimarães: *Diferenciação de Espécies Bacterianas com Inteligência Artificial a partir de Compostos Orgânicos Voláteis*
- Felipe Yamada; Flávia Barbosa; António Prata Cardoso; **Luís Guimarães**: *Reframing Signal Drift: An AI-Based Approach for Functionalized Graphene Sensors*
- **Antonio Forno**; John Hart; Samuel Moniz; Haden Quinlan: *How integration of generative AI and optimization methods can accelerate product design and manufacturing process development?*
- João F. Botas; Diogo A. Freitas; Ricardo A. Galvão; Miguel G. Pereira; **Filipe R. Ramos**: *Forecasting UK Socioeconomic Indicators under Political Uncertainty: Classical vs Deep Learning Approaches*

### Session 3.5 - Data Envelopment Analysis (Room 5)

Chair: Miguel Alves Pereira

Language: English. Portuguese

- **Rodrigo Cardoso;** Maria Gouveia; Carla Henriques: *Avaliação da Eficiência das Universidades Europeias*
- **Leonardo Fonseca;** Maria Gouveia; Carla Henriques: *A eficiência bancária na europa – uma análise ao período 2014-2022*

**Monday 14:15 - 15:15**

### Session 4.1 – Transportation and Delivery (Room 1)

Chair: Elsa Silva

Language: English. Portuguese

- **Raquel Monteiro De Nobre Costa Bernardino;** Daniel Santos: *Two-index formulations for the Traveling Purchaser Problem with Incompatibility Constraints*
- **Tiago Monteiro;** João Pedro Pedroso; Ana Viana: *Last-mile Delivery with Crowdsipping: a multi-objective approach*
- Luciano Ferreira; Marcos Vinicius Milan Maciel; **José Valério de Carvalho;** Elsa Silva; Filipe Pereira Alvelos: *A new effective heuristic for the Prisoner transportation problem*
- **Paulo Ferreira;** Sara Martins; Maria Santos: *A pickup and delivery problem with automated guided vehicles - modelling approaches*

### Session 4.2 - Sustainable supply chains (Room 2)

Chair: Ana Barbosa-Póvoa

Language: English

- **Ruben Pereira;** Sara Martins; Maria João Santos: *Optimising Insect-Production Facility Location: A Bi-objective Cost-Sustainability Model*
- **Maria da Graça Raposo;** Cátia da Silva; Ana Barbosa-Póvoa: *Collaborative Strategies for Efficient Environmental Cost Distribution in Sustainable Supply Chains*
- **Valentina Bonomi;** Diana Jorge; Ana Barbosa-Póvoa; Tânia Ramos: *A Sustainable Approach to Urban Last-Mile Logistics: Modeling and Analysis of a Green Two-Echelon Location-Routing Problem with Eco-Conscious Customer Behavior*
- **Marcelo Pinto;** Maria João Alves; Carlos Henggeler Antunes; Samuel Moniz; Cristóvão Silva: *Design and planning of sustainable supply chains regulated by government incentives*

### Session 4.3 - Teams management and scheduling (Room 3)

Chair: Rui Borges Lopes

Language: English. Portuguese

- **Afonso N. Neves**; J. J. M. Machado: *Workforce Strategic Productivity Analysis and Optimization in a Retail Company*
- Maria Isabel Gomes; **Margarida Lopes**: *Optimization of home care visits: a study case on family support organizations*
- **Maria Tovar**; Sara Cruz; Ana Wemans; Jorge Roussado; Ricardo L. Saldanha; Ana Paias: *Scheduling crew reserve duties with flexible time windows*
- Dorirley Alves; **Rui Borges Lopes**: *Revisão de literatura sobre escalonamento cíclico de turnos com rotação de folgas e horários fixos*

### Session 4.4 - Operations management and logistics (Room 4)

Chair: Carina Pimentel

Language: English. Portuguese

- Estela Bicho; Inês Costa; **Eliana Costa e Silva**; Wolfram Erhagen; Cátia Ferreira; Gianpaolo Gulletta; Luís Louro; Pedro Ribeiro; Daniel Rodrigues: *Otimização Não Linear para a Geração de Robôs Antropomórficos em Tarefas de Reposição*
- **Monica Gaboleiro**; Maria Isabel Gomes; Isabel L. Nunes: *Human-Centered Optimization in Logistics: A Case-Based MILP Model for Safer Picking*
- **Mário Leite**; Telmo Pinto; Cláudio Alves: *A Hybrid Framework for the Integrated Production and Routing Problem with Sequence-Dependent Setups and Multi-Period Constraints*
- Saeed Tasouji Hassanpour; Reinaldo Gomes; **Carina Pimentel**; Radu Godina: *Modelo de otimização robusta para a gestão da cadeia de abastecimento agroflorestal residual*

**Monday 15:30 - 16:30**

### Session 5.1 - Vehicle routing (Room 1)

Chair: Pedro Martins

Language: English

- **Philippe Almeida Mirault**; Pedro Amorim; Ricardo Soares: *A Rich and Heterogeneous Fleet Vehicle Routing Problem for Fuel Lane Management and Wildfire Prevention*
- Ana Maria Rodrigues; **Elif Göksu Öztürk**; Isabel Cristina Lopes: *A hybrid optimisation method for vehicle routing in a fleet of multi-compartment vehicles with controlled temperature settings*
- **Arthur Corrêa**; Samuel Moniz; Cristóvão Silva: *One Model, Many Constraints: Multi-task learning for Multi-depot Vehicle Routing Problems*
- Lara Rocha; **Pedro Martins**: *Route planning in a condominium company using mathematical optimization*

## Session 5.2 - OR in Energy 2 (Room 2)

Chair: Eliana Costa e Silva

Language: English

- **Leonardo Santana**; Fernando Pessoa; Ana Barbosa-Póvoa: *Decision support system for sustainable implementation of hydrogen supply chains in Brazil*
- Ana Borges; **Margarida Correia**; Eliana Costa e Silva: *Integrated Battery Management in Photovoltaic Power Plants: A Real Case Study*
- **Masoud Golalikhani**; Flávia Barbosa; Luís Guimarães; Luciana Yamada: *A comprehensive optimization framework for designing hybrid offshore renewable energy systems*
- **Daniel Matos**; Maria Gouveia; Carla Henriques: *Avaliação da Pobreza Energética na União Europeia: Uma Abordagem Multidimensional e Dinâmica (2015–2023)*

## Session 5.3 - Hard optimization problems (Room 3)

Chair: Samuel Moniz

Language: English. Portuguese

- **Margarida Caleiras**; Samuel Moniz; Paulo Nascimento: *A mathematical formulation for the imaging and communication scheduling problem for super-agile Earth observation satellites*
- **Rohollah Garmanjani**: *A Novel Derivative-Free Method with Improved Complexity for Nonsmooth Convex and Strongly Convex Optimization*
- **João Pedro Pedroso**: *New ideas on Monte Carlo tree search for optimization*
- **Paulo Monteiro**; João Soares: *Sobre clutters minimalmente não ideais*

## Session 5.4 - Optimization with uncertainty (Room 4)

Chair: Filipe Alvelos

Language: English. Portuguese

- **Parisa Ahani**; Maria Isabel Gomes: *Fleet Composition under Uncertainty: A Multi-Objective Optimization Approach*
- **João Martins**; Carlos Henggeler Antunes; Telmo Pinto: *Bi-objective Pollution Routing Problem with Uncertain Demand and Travel Time*
- Fábio Lopes; **Ana Amaro**: *Managing Supply Chain Disruptions through Design Science Research: A Mathematical Modeling and Simulation Approach*
- **Francisco Maia**; Gonçalo Figueira; Fábio Neves-Moreira: *Evolutionary Adaptive Policies for the Stochastic Dynamic Inventory-Routing Problem*

## Day 3 – Tuesday Sept. 9th

Location: [Amarante Cine-teatro, Av. Gen. Silveira, 4600-758 Amarante](#)

### Tuesday 10:00 - 11:30

#### EstudIO Plenary (Auditorium)

*Chairs:* Beatriz Oliveira and Maria João Santos

*Language:* English. Portuguese

- **Miguel Costa** - *Um modelo de agendamento de exames universitários*
- **João Melo** - *Optimization of berth allocation and tugboat scheduling under uncertainty*
- **Ana Hansems** - *New Integer Programming Models for the Multi-Depot Vehicle Routing Problem with Inter-Depot Routes*
- **Margarida Abreu** - *Methods for Bi-objective Routing and Districting Problems*
- **Vera Galvão** - *Melhorar a Eficiência dos Cuidados Domiciliários: uma abordagem heurística*
- **Ruben Gonçalves** - *Optimization and economic analysis of energetic systems in a wastewater treatment plant*
- **André Borges** - *Optimisation Model for Demand-Side Flexibility in the Agricultural Sector*
- **Ana Costa** - *Balanceamento de Postos de Montagem de Sofás: Uma abordagem de Otimização*
- **Joana Pais** - *Otimização Aplicada a uma Empresa de Processamento e Embalamento de Arroz*
- **Lucas Malheiros** - *Sistema de aprendizado de máquina para a recomendação de métodos de otimização aplicado a problemas de dimensionamento de lotes com múltiplas plantas*

### Tuesday 12:00 - 12:45

#### Plenary Session (Auditorium)

*Chair:* Sara Martins

*Language:* English.

- **Fernando Belezas**: *Startup selection, performance, and impact of business incubators*

### Tuesday 12:45 - 13:30

#### Closing Session (Auditorium)