



## SCIENTIFIC PROGRAM

Monday, July 22

Monday, 11.30 – 12.30

### Plenary Talk (Auditório Pacheco de Amorim)

Emilio Carrizosa, *One day optimizers became data scientists...*

Chair: Carlos Henggeler Antunes

Monday, 14.00 – 16.00

### EstudIO – sponsored by SISCOG (Auditório Pacheco de Amorim)

Chair: Tânia Ramos

- Katrin Munzenrieder. *Staff Scheduling at an Emergency Medical Service - A meta-heuristic approach*
- Armando Peixoto. *Delivery Time Slot Management Methods in Online Retail*
- Daniela Coito. *Modelo de Gestão de Operações em Postos de Transformação de Distribuição*
- Oleksand Pavlenko. *Redução do impacto ambiental com recurso ao planeamento de rotas de veículos*
- Sofia Almeida. *Operational Planning of Aluminium Profiles Production by Direct Extrusion*
- Rita Martins. *Exact and hybrid optimization algorithms for the integrated personnel shift and task scheduling*
- Bernardo Silva. *In-Store Capacity Planning – The Case-Study of a Furniture Retailer*
- Valeria Romanciuc. *Optimizing Kidney Exchange Programs with budget constraints*
- Mariana Teixeira. *Otimização de uma rede de recolha e valorização de pneus usados*
- Ana Catarina Carvalho. *Otimização do Product Mix baseado num sistema de custeio baseado nas atividades usando programação inteira mista*
- Madalena Lima. *Integration of inventory management and distribution scheduling: An optimization model for a hospital context*
- Sebastião Graça. *Designing In-House Logistics Operations towards Industry 4.0: The case of Autoeuropa*

**Monday, 16.30 – 18.00**

**Parallel Session M1 (Room B253): Transportation Management & VRP I**

Chair: Gonalo Figueira

Language: English

- Beatriz B. Oliveira, Maria Ant3nia Carravilla and Jos3 Fernando Oliveira. *Scenario (and solution) generation using metaheuristics for fleet management and pricing in car rentals*
- Diana Jorge, Ana de Aguiar, Carolina Morais, T3nia Ramos, Ana P3voa and Ant3nio Antunes. *Two heuristic approaches for solving the Smart Waste Collection Routing Problem*
- Leonor Santiago Pinto, Jo3o Janela and Maria C3ndida Mour3o. *A hybrid matheuristic for a refuse collection application*
- Jorge Roussado and Ana Wemans. *Optimizao de escalas de maquinistas com gerao de colunas e pesquisa local*
- Wan Zhang, Susana Relvas, Ana Barbosa-P3voa and Yongtu Liang. *Detailed scheduling optimization of transmix oil recycling logistics*
- Gonalo Figueira, Rui Lopes, Cristiane Ferreira, Pedro Amorim and Bernardo Almada-Lobo. *Operations management problems solved by decision rules: why, what and how to learn them*

**Parallel Session M2 (Room B255): OR in Health and Life Sciences**

Chair: Filipe Alvelos

Language: Portuguese / English

- Sofia Cruz-Gomes, M3rio Amorim-Lopes and Bernardo Almada-Lobo. *Health Expenditures in OECD countries: An Econometric Analysis*
- Bernardo Teixeira, Maria Isabel Gomes, Telma Sequeira, Jos3 Pedro Bol3o-Tom3 and Filipe Ferreira da Silva. *Avaliao de protocolos cl3nicos de cancro no pulm3o: um caso de estudo*
- Tiago Monteiro, Jo3o Pedro Pedroso, Ana Viana and Xenia Klimentova. *Reinforcement Learning for Robust Optimization: an Application in Kidney Exchange Programs*
- Edgar Mascarenhas, M3nica Oliveira and Ricardo Fernandes. *Hospital-based HTA meets OR: Challenges for structured and value-driven assessment of medical devices*
- Mariana Oliveira and In3s Marques. *Facing dynamic demand for surgeries in a Portuguese case study*
- Filipe Alvelos and Val3ria Romanciuc. *Crossmatch testing in kidney exchange programs*

**Parallel Session M3 (Room B254): Data Mining & Data Analysis**

Chair: Lu3s Guimar3es

Language: Portuguese / English

- Marcio Basilio and Valdecy Pereira. *Identification of operational demand in law enforcement agencies: an application based on a probabilistic model of topics*
- Filipe Ramos, Anabela Costa, Diana Mendes and Vivaldo Mendes. *Forecasting financial time series using deep learning techniques*
- Lu3s Carvalho, Fl3via Barbosa, Pedro Amorim, Daniel Pereira and Paulo Sousa. *Tactical time slot management under fulfilment considerations in e-grocery*

- Rui Lopes, Gonçalo Figueira and Mário A. Lopes. *Assessment of Predictive Methods for Intermittent Demand*
- Liliana Silva, Paulo Teles, Paulo Sousa, Paulo Pereira, Pedro Campelo, Teresa Aguiar and Pedro Amorim. *Market Sizing for "Reduced-Risk Products" in the Tobacco Industry*
- Diogo Sá, Andreia Cardoso, Pedro Schuller, Luís Guimarães and Sameiro Carvalho. *A stock quantification of a Demand Planning process improvement, under a S&Op context*

**Parallel Session M4 (Room B257): DEA & Performance Analysis**

Chair: Ana Camanho

Language: Portuguese / English

- Diogo Ferreira, Rui Marques and Alexandre Morais Nunes. *Pay for performance in health care: A new best practices tariff-based tool using a loglinear piecewise frontier function and a dual-primal approach for unique solutions*
- Miguel Pereira, Diogo Ferreira, José Figueira and Rui Marques. *Evaluating the efficiency of the Portuguese National Health System: A network data envelopment analysis approach*
- João Carlos Soares de Mello, Deivison Pereira, Luana C. Brandão, Nissia Bergiante and Mariana Almeida. *Assessment of Brazilian Airport System Efficiency*
- Micael Simões, Rogério Rocha and Ana Camanho. *Benchmarking Smart Grid Research & Development engagement by European Distribution System Operators*
- Flávia Barbosa, Alda Henriques, Ana Camanho and Giovanna D'Inverno. *Efficiency and effectiveness improvement of wastewater treatment plants considering Emission Quotas*

**Parallel Session M5 (Room B259): Discrete Optimization, Graphs**

Chair: Jorge Orestes Cerdeira

Language: English

- Marta Pascoal. *O problema da afetação com custo e amplitude mínimos*
- Sara Cruz and Carlos Iglésias. *O problema dos k-caminhos mais curtos com dissemelhanças medidas de forma contínua*
- Ali Moghanni and Marta Pascoal. *The rough interval shortest path problem*
- Inês Serôdio Costa, Rosa Figueiredo and Cristina Requejo. *The Shortest Path in Signed Graphs*
- Agostinho Agra, Jorge Orestes Cerdeira and Cristina Requejo. *A computational comparison of compact MILP formulations for the zero forcing number*

**Tuesday, July 23**

**Tuesday, 9.00 – 10.30**

**Parallel Session TAI (Room B253): Transportation Management & VRP II**

Chair: Maria Cândida Mourão

Language: English

- Ricardo Soares, Alexandra Marques and Pedro Amorim. *Multiple vehicle synchronisation in a full truck-load pickup and delivery problem: a case-study in the biomass supply chain*
- Ana Raquel Aguiar, Carolina Moraes, Tânia Ramos and Ana Barbosa-Povoa. *Searching for a solution method for the Smart Waste Collection Routing Problem*
- Masoud Golalikhani, Beatriz Brito Oliveira, Maria Antónia Carravilla and José Fernando Oliveira. *Carsharing: a literature and a business review toward an integrated decision-making framework*
- Ana Maria Rodrigues, Henrique Correia, José Soeiro Ferreira, Isabel Cristina Lopes, Cristina Oliveira and Maria João Cortinhal. *Recolha e distribuição de bens alimentares em instituição de solidariedade social*
- Maria Cândida Mourão, Reinaldo Ferreira, Margarida Moz, Leonor Santiago Pinto, Vasco Móra and João Ribeiro. *Parking Enforcement in Lisbon – an arc routing approach*

**Parallel Session TA2 (Room B255): Energy, Environment, Nat. Resources & Climate I**

Chair: Manuel Matos

Language: Portuguese / English

- Isabel Martins, Susete Marques, Marlene Marques and Marco Marto. *Uma abordagem com branch-and-cut e branch-and-bound sequenciais para o problema de gestão florestal com múltiplos cortes rasos*
- Juliana Salvadorinho, Bárbara Soares, Joana Cordeiro and Ana Moura. *Estudo comparativo de abordagens para reconfiguração de redes de distribuição de energia elétrica*
- Alexandra Oliveira, Luís Guimarães, Armando Leitão, Leonel Carvalho, Luís Dias and Miguel Ribeiro. *Reliability Assessment of Distribution Lines*
- Inês Soares, Maria João Alves and Carlos Henggeler Antunes. *Otimização em dois níveis para a definição de tarifas com períodos e preços variáveis – uma aplicação no setor elétrico*
- José Fidalgo and Manuel Matos. *Escalonamento de grupos de produção de eletricidade considerando cargas difusas*

**Parallel Session TA3 (Room B254): Production & Operations Management I**

Chair: Helena Alvelos

Language: Portuguese / English

- Vanessa Sousa, Samuel Moniz, Cristóvão Silva and Pedro Neto. *Extending the Resource Task Network for scheduling collaborative robots in assembly lines*
- Maria Teresa Pereira, Isabel Cristina Lopes, Luís Pinto Ferreira and Silvana Oliveira. *A CVRP Model for an In-plant Milk Run System*

- Rodrigo Macedo, Fábio Coelho, Susana Relvas and Ana Barbosa-Póvoa. *In-house logistics operations enhancement in the automobile industry using simulation*
- Fabiane K. Setti, Carla A. S. Geraldés, João P. Almeida and Marcelo G. Trentin. *Analysis and Optimisation of a Production Line Using Discrete Simulation*
- Idália Oliveira and Helena Alvelos. *Improving the performance of the internal supply chain: the case of a cork company*

#### **Parallel Session TA4 (Room B257): OR in Industry**

Chair: Sara Martins

Language: Portuguese / English

- Miguel Vieira, Helena Paulo, Tânia Varela and Ana Barbosa-Póvoa. *Design and scheduling of multipurpose plants under demand uncertainty: A model-based decision support system*
- Daniela Pinho, Raquel Vieira, Diogo Miranda, Daniel Pereira, Pedro Amorim and José F. Oliveira. *Leveraging Simulation-Optimization to Determine Fashion Delivery Patterns*
- Filipe Ferrás, Aldina Correia, Eliana Costa E Silva and Fátima De Almeida. *Optimized conditions to industrial aluminium extrusion*
- Catarina Marques, Samuel Moniz and Jorge Pinho de Sousa. *Strategic decision-making in the development of pharmaceutical products*
- Sara Martins, Ana Sofia Figueiredo, José Cunha, Pedro Amorim, Luís Guimarães and Bernardo Almada-Lobo. *Food Supply Chains: thoughts on strategies to mitigate food waste*

#### **Parallel Session TA5 (Room B259): Scheduling**

Chair: Tânia Pinto Varela

Language: Portuguese / English

- Rita M. Portugal, Luís M. Albino and Ricardo L. Saldanha. *Otimização de rotações de material circulante em ordem ao lucro: um caso de estudo na América do Norte*
- Mariana Cunha, Inês Marques and Ana Póvoa. *A Metaheuristic Approach for Staff Scheduling at Emergency Medical Services*
- João Sacramento, Tânia Varela and Nelson Martins. *A Meta-Heuristics Approach for Production Scheduling – A Real Case Study*
- Rafael Carvalho, José Queiroga, João Alves, Pedro Schuller, Teresa Bianchi-Aguiar, Luis Guimarães, Bernardo Almada-Lobo and José F. Oliveira. *Lot-sizing and scheduling problem with resource allocation: a rolling-horizon approach*
- Daniel Carvalho, Eduardo Curcio and Pedro Amorim. *Practical production planning and scheduling optimization*

**Tuesday, 11.00 – 12.30**

#### **Parallel Session TBI (Room B253): Decision Support Systems**

Chair: Jorge Pinho de Sousa

Language: Portuguese / English

- Mafalda Ivo de Carvalho, Ana Barbosa Póvoa and Susana Relvas. *Waste and by-products Mapping: A tool to foster Supply Chain Sustainability*

- Liliana Freitas, Ana Vieira, Mónica Oliveira and Carlos Bana E Costa. *Embedding behavioural OR within Delphi knowledge construction processes in health settings*
- Miguel Vieira, Fábio Coelho, Cátia da Silva, Bruna Mota, Joana Guapo, Rodrigo Macedo, Bruno Gonçalves, Samuel Moniz, Tânia Pinto-Varela, Ana Carvalho, Susana Relvas and Ana Barbosa-Povoa. *Towards an integrated decision-support framework for the new generation of manufacturing systems*
- Maria Eugénia Captivo, Ana Sofia Carvalho and Inês Marques. *A mathematical model for the ambulance dispatching and relocation problems to optimize system's preparedness*
- Nuno Falcão e Cunha, Eduardo Curcio, Pedro Amorim and Bernardo Almada-Lobo. *Robust Supply Chain Design of Aerospace Supply Chains under Probabilistic Bounds for Constraint Violation*
- Jorge Pinho de Sousa. *Sistemas de Apoio à Decisão em Mobilidade Urbana*

**Parallel Session TB2 (Room B255): Energy, Environment, Nat. Resources & Climate II**

Chair: Alexandra Marques

Language: Portuguese / English

- Carolina Diniz Melo, Susana Relvas and Ana Paula Barbosa-Póvoa. *Strategic and Tactical Planning of the Downstream Petroleum Supply Chain*
- Angelo Aliano Filho and Helenice Florentino Silva. *The E-constraint method to solve a bi-objective problem of sustainable cultivation*
- Marta Mesquita, Susete Marques, Marlene Marques, Marco Marto, Miguel Constantino and José G. Borges. *An approach to address road network design, machinery location and routing problems in forest management planning*
- Helena Paulo, Ana Barbosa-Povoa and Susana Relvas. *Integrated Biorefinery Supply Chains Design: Modelling Technological Uncertainty Using Learning Curves*
- Reinaldo Gomes, Ricardo Soares and Alexandra Marques. *Biomass supply network design through facility location and equipment assignment: linking strategic and tactical decisions*

**Parallel Session TB3 (Room B254): Production & Operations Management II**

Chair: Agostinho Agra

Language: Portuguese / English

- Mariana Amaral, Rui Trindade, Samuel Moniz, Cristóvão Silva and Jorge Pinho de Sousa. *Dimensionamento e escalonamento de lotes de produção numa unidade fabril de injeção de plásticos*
- Mateus Martin, José Fernando Oliveira, Elsa Silva, Reinaldo Morabito and Pedro Munari. *The constrained three-dimensional guillotine cutting problem: ILP formulations and a bottom-up algorithm*
- Óscar Oliveira, Dorabela Gamboa and Elsa Silva. *Adaptive Sequence-based Heuristic for Two-Dimensional Non-Guillotine Packing Problems*
- Xavier Andrade, Luis Guimarães and Gonçalo Figueira. *Product line selection in the fast-moving consumer goods industry: literature review and opportunities for research*
- Marcio Costa Santos, Agostinho Agra and Michael Poss. *Robust inventory theory with perishable products*

**Parallel Session TB4 (Room B257): Supply Chain Management I**

Chair: Bruna Mota

Language: Portuguese / English

- Alda Henriques, Milton Fontes, Ana Camanho, Jaime Gabriel Silva and Pedro Amorim. *Sewage sludge management optimization with energy recovery: a supply chain design approach*
- Diego Camara, Tânia Pinto-Varela and Ana Barbosa-Povoa. *A multi-objective and multi-period model to the design and operation of a hydrogen supply chain: an applied case in Portugal*
- Ana Teixeira, Eliana Costa e Silva and Isabel Cristina Lopes. *A Multiperiod Model for Supply Chain Management in the Retail Sector*
- Ana Amaro. *A comprehensive supply chain planning: pharmaceutical alliances for sustainable services*
- Bruna Mota, Ana Carvalho, Maria Isabel Gomes and Ana Barbosa-Povoa. *Evaluating the impact of different approaches in LCA in its application to supply chain design and planning optimization models*

**Parallel Session TB5 (Room B259): MCDA**

Chair: Luís Dias

Language: Portuguese / English

- Isabel Cristina Lopes, Ana Maria Rodrigues, Cristina Oliveira, José Soeiro Ferreira and Maria João Cortinhal. *Sectorization for managing maintenance technicians*
- Ana Sara Costa, José Rui Figueira and José Borbinha. *Building a multiple criteria nominal classification model: Application to the Portuguese Army Special Forces recruitment process*
- Jorge Noro and Luís C. Dias. *Gestão de portefólios considerando o compromisso dos agentes*
- Max Oliveira, Marcio Basilio, Valdecy Pereira and Fabricio Moça. *Aplicação de método multicritério para modelagem de processo de avaliação e desempenho: Um estudo de caso em uma agência de governo*
- Mónica Oliveira, Ana Vieira, Aris Angelis, Panos Kanavos and Carlos Costa. *A multicriteria framework to assist HTA agencies on the evaluation of new drugs on a common basis*

**Tuesday, 14.00 – 15.00**

**Plenary Talk (Auditório Pacheco de Amorim)**

Sofiane Oussedik, *Operations Research and Machine Learning use cases*

Chair: João Patrício

**Tuesday, 15.30 – 17.30**

**Parallel Session TCI (Auditório Pacheco de Amorim): Meet the Editors**

**Parallel Session TC2 (Room INFO): IBM Hands-on Session**

## Wednesday, July 24

Wednesday, 9.00 – 10.30

### Parallel Session W1 (Room B253): Transportation Management & VRP III

Chair: Cristina Requejo

Language: English

- Maria Santos, Pedro Amorim, Eduardo Curcio, Margarida Carvalho and Alexandra Marques. *A bilevel optimization model for the collaborative transportation planning*
- Eduardo Curcio, Maria João Santos, Pedro Amorim, Brenner Ojeda Rios, Eduardo Xavier and Flávio Miyazawa. *Recent trends on dynamic vehicle routing problems*
- Filipe Rodrigues, Agostinho Agra, Marielle Christiansen, Lars Magnus Hvattum and Cristina Requejo. *Comparing techniques for modelling uncertainty in a maritime inventory routing problem*
- Sara Ali, José Fernando Oliveira, Maria Antónia Carravilla and António Ramos. *Online packing heuristics for the container loading problem*
- Luis M. Albino and Gonçalo P. Matos. *Otimização de horários periódicos de transportes públicos com IA e IO*

### Parallel Session W2 (Room B255): Other OR Applications

Chair: João Almeida

Language: Portuguese / English

- Paula Felipe and Maria Mello. *Analysis of the results of the 2018 FIFA World Football Cup using graph centralities*
- Carlos Augusto Teixeira Coelho, João Vítor Araújo Garcês, Nathalia Soares Bento da Silva and Maria Mello. *Utilização de Grafos para análise dos gols realizados nos países sede das copas do mundo de futebol - FIFA*
- Jéssica Antonio Delgado and Edméa Cássia Baptista. *The Investigation of penalty/interior points method and the solution of Discreet Reactive Optimal Power Flow*
- João Almeida and Alberto Pinto. *Hotelling game on networks*

### Parallel Session W3 (Room B254): Production & Operations Management III

Chair: Ana Raquel Xambre

Language: Portuguese / English

- Isabela Maganha, Cristóvão Silva and Samuel Moniz. *Leveraging the reconfigurability of assembly lines through mobile collaborative robots*
- Joana Guapo, Tânia Varela, Miguel Vieira and Nelson Chibeles-Martins. *A Multi-objective Metaheuristic Approach for the Planning in Flexible Assembly Lines*
- Manuel V.C. Vieira and Miguel F. Anjos. *Mathematical Optimization Approaches for Facility Layout on Several Rows*



- José Suspiro, Samuel Moniz, Cristóvão Silva, Carlos Henggeler Antunes, Tânia Pinto-Varela and Ana P. Barbosa-Póvoa. *Using discrete-event simulation to model chemical processes*
- João Tomás Álvaro and Ana Raquel Xambre. *Improvement actions in a manufacturing cell: a simulation study*

#### **Parallel Session W4 (Room B257): Supply Chain Management II**

Chair: Telmo Pinto

Language: English

- Cátia da Silva, Ana Barbosa-Povoá and Ana Carvalho. *Design and Planning of Green Supply Chains with Risk Concerns*
- Hugo Torres, Abílio Pereira Pacheco, João Claro, Michele Salis, Matthew P. Thompson, Crystal S. Stonesifer, Gavino Diana and Silvio Cocco. *Flexible design of a heliports network used in forest fire suppression applied to the case of Sardinia*
- João Pires Ribeiro, Bruna Mota and Ana Barbosa-Póvoa. *Merging Resilience and Sustainability in Supply Chain Design*
- Thomy Saputro, Gonçalo Figueira and Bernardo Almada-Lobo. *Considering Inventory and Transportation in Supplier Selection Decisions: A Simulation-Optimization Approach*
- Telmo Pinto, Carlos Malarranha, Bruna Mota, Ana Carvalho, Cláudio Alves, José Manuel Valério De Carvalho and Ana Barbosa-Povoá. *Sustainable supply chain design and planning and strategic ramp-up: the case of the aerospace industry in the adoption of advanced materials technologies*

#### **Parallel Session W5 (Room B259): Invited Session & Continuous Optimization**

Chair: Tatiana Tchemisova

Language: English

- Tatiana Tchemisova and Olga Kostyukova. *Immobile indices in linear Semi-infinite and Copositive Programming*
- Alexander Dudin, Sergey Dudin and Olga Dudina. *Synthesis of the Optimal Control by Queueing System with Service Quality and Rate Depending on the Amount of the Harvested Energy*
- Joana Dias, Humberto Rocha, Tiago Ventura, Brígida Ferreira and Maria do Carmo Lopes. *Optimização Angular no planeamento de tratamentos de radioterapia: a importância da escolha da função objectivo*
- Luis Dias, Luis Guimarães and Armando Leitão. *Asset management decisions optimization on a multi-dependent portfolio*
- Maria João Alves and Carlos Henggeler Antunes. *Cálculo de soluções extremas e moderadas para problemas de otimização em dois níveis multiobjectivo*

**Wednesday, 11.00 – 12.00**

#### **Plenary Talk (Auditório Pacheco de Amorim)**

José Valério de Carvalho, *Pseudo-polynomial models in optimization: an overview*

Chair: Maria Antónia Carravilla