International Network Optimization Conference 2026

Welcome to INOC 2026

It is with great pleasure that we welcome you in Liège for the 12th edition of the International Network Optimization Conference. The conference series provides a forum for researchers in the broad field of network optimization to present and publish their latest results and ongoing research. INOC is the conference of the European Network Optimization Group (ENOG), a working group of EURO, the Association of European Operational Research Societies.

Over 85 participants from all over the world will have the opportunity to attend a rich scientific programme with three keynote talks, a sponsored talk by our platinum sponsor Hexaly, and 57 contributed presentations. Among the submitted full research papers, 22 were selected by the program committee for publication in an OpenProceedings volume.

We hope you will enjoy the wide range of social and cultural activities which will take place in the heart of the city of Liège. In addition to a welcome cocktail and conference dinner, you will enjoy a breaking-ice social activity on Thursday afternoon.

We are grateful to all participants that will make INOC 2026 a special place to exchange scientific ideas and come together in a very friendly environment. This organization would not have been possible without the help and constant support of the organizing committee that I would like to heartfully thank here. I also want to thank the steering committee for their valuable advice and the members of the program committee for their active participation in the review process. Finally, I am grateful to our sponsors for their support: our platinum sponsor Hexaly, as well as HEC Liège for making the spaces in the school available to us, and finally the Fund for Scientific Research - FNRS, the European Network Optimization Group (ENOG), EURO, and the Belgian OR Society (ORBEL).

This INOC edition is hosted in the new building of HEC Liège. HEC Liège is the Management School of the University of Liège (ULiège). The University is an active partner of a network of over 900 universities promoting the exchange of students, researchers, and skills. As a faculty of the University, HEC Liège is one of the leading Belgian management schools hosting graduate and postgraduate study programmes. The School counts 110 full-time faculty members and researchers and about 3,500 students. It promotes an empowering pedagogy leading students to play a proactive part in their education. HEC Liège's commitment to and ongoing investment in quality improvement has been recognized through the international Accreditations AACSB and EQUIS (delivered by EFMD).

We wish you a very interesting and fruitful meeting and a pleasant stay in Liège.

Bernard Fortz
INOC 2026 Chair

Programme committee

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ENOG NETWORK OPTIMIZATION

www.euro-online.org/enog

Management School - Liège Université

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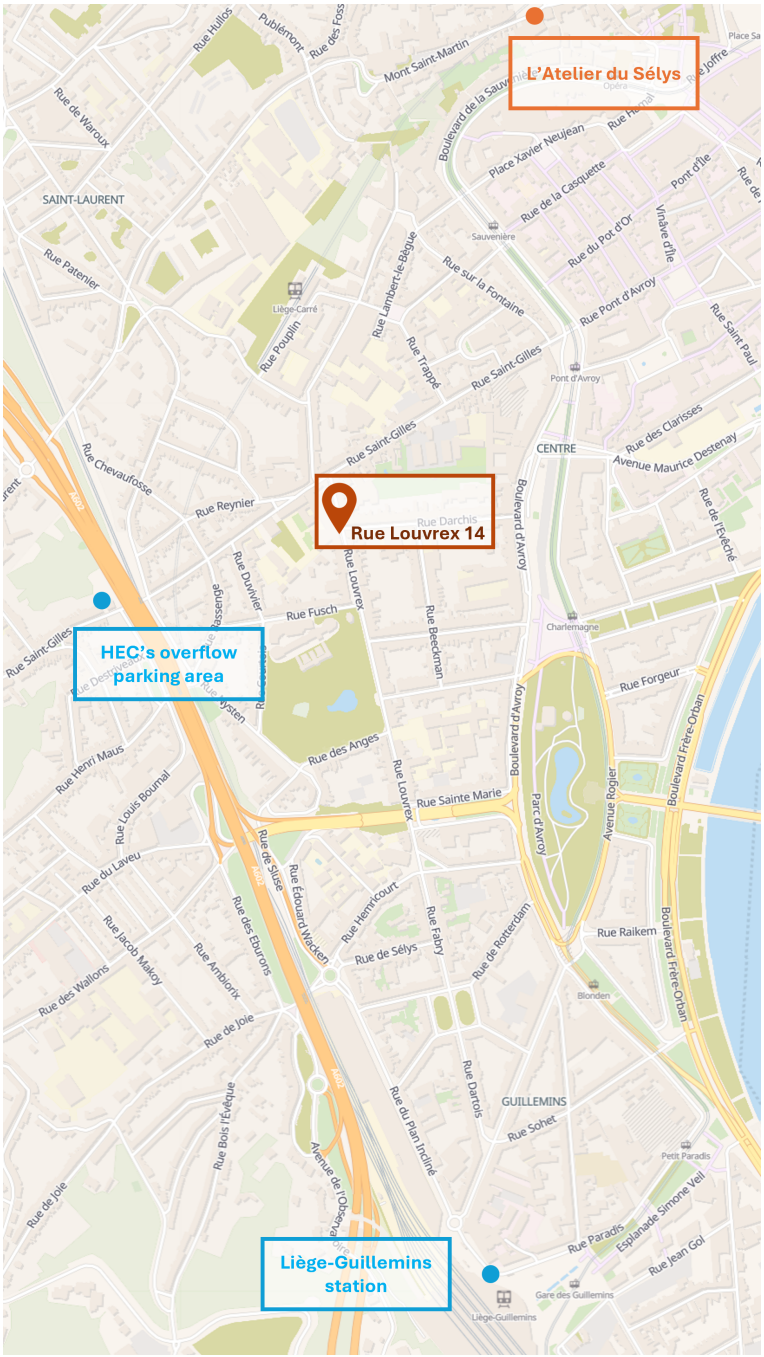
Practical information

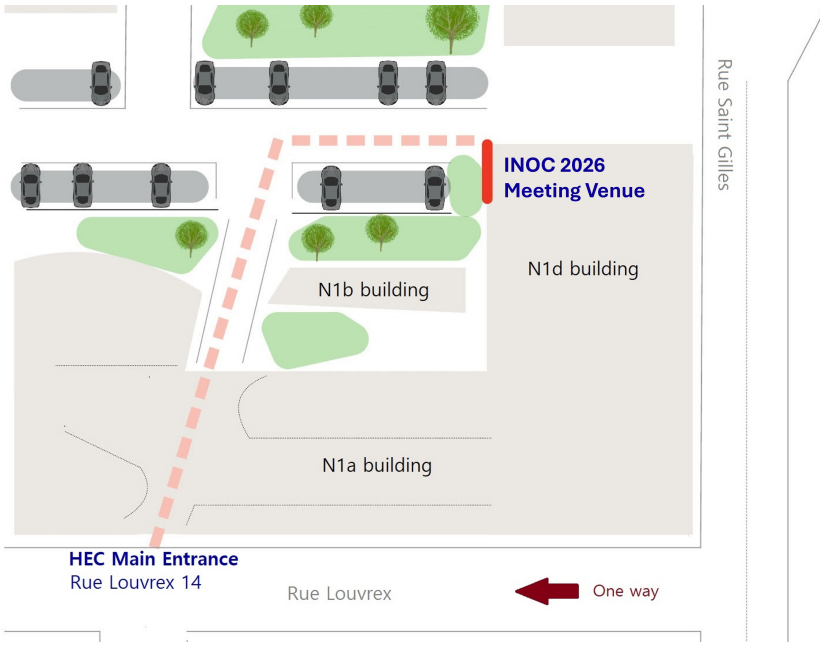
Accessibility



The conference takes place at the N1d and N1a buildings of HEC Liège, Rue Louvrex 14, 4000 Liège. The school is located close to the city centre and just a 15-minute walk away from the Guillemins train station.

Participants coming with the car have access to HEC's overflow parking area (next to Rue Saint-Gilles 354), using a code sent by e-mail upon request (louise.tassin@uliege.be).

In order to access the N1d building, enter the N1a building Rue Louvrex 14, then exit the building on the opposite side of the entrance and follow the directions.



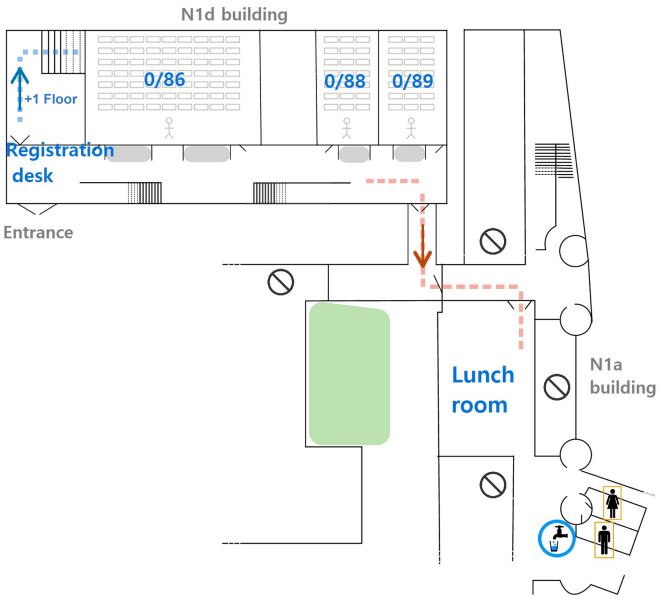
Meeting venue

The registration desk will be located at the meeting venue in the **N1d** building, where you will be provided with your name badge and registration pack for the event. Registration will be open from 9:00 AM to 9:20 AM on April 22, 2026.

The keynote sessions take place in room 0/86 and the parallel sessions in rooms 0/86, 0/88, 0/89, and 1/82 (ground floor and floor +1 of the N1d building). The conference rooms are equipped with a video projector using an HDMI port. Please bring your own computer.

Each talk is allocated 30 minutes, including discussion. Please note that we are running on a tight schedule. Therefore, it is essential that you limit your presentation to the assigned time. In order to allow inter-session hopping, we ask the chairpersons to follow the planned schedule as faithfully as possible.

The buffet lunches, coffee breaks and the Welcome reception (Wednesday afternoon) take place in the school lunchroom in the N1a building. Follow the directions or refer to the map below.



Social activity

A social activity is organized in the city center on Thursday afternoon. All those who registered to participate are asked to gather at the meeting point, Place du Marché (https://maps.app.goo.gl/q3P8fHpgvTshfpcu8), at 3:30PM. A group departure from HEC Liège will be organized at around 3PM, after Keynote II and Hexaly presentation. The activity will finish at 6:30PM at the latest, Place du Marché.

Conference dinner

The conference dinner is scheduled on Thursday, April 24 at 7:30PM in the **Atelier du Sélys** (restaurant of the Van Der Valk Sélys hotel). It is conveniently situated in the heart of the city, within a 20-minute walking distance from HEC and 40 minutes from the Guillemins train station (15 minutes if walking is combined with the tramway).

Wifi connection

To connect to the wifi “Guest", you can use the following ID and password:

- ID: **f099934**
- Password: #**6MVnPAw**

General schedule

Wednesday, April 22

08:30-09:00	Welcome coffee *Lunch room*		
09:00-09:20	Registration *N1d building hall*		
09:20-09:30	Opening session		
09:30-10:30	Keynote I - William Cook *Chair: Bernard Fortz* *Room 0/86*		
10:30-11:00	Coffee break *Lunch room*		
11:00-12:30	Parallel sessions - WB		
	WB 1 *Chair: N. Gillis* *Room 0/86*	WB 2 *Chair: M. Weiler* *Room 0/88*	WB 3 *Chair: Y. Arda* *Room 1/82*
12:30-13:30	Lunch *Lunch room*		
13:30-15:00	Parallel sessions - WC		
	WC 1 *Chair: W. Ben-Ameur* *Room 0/86*	WC 2 *Chair: F. Engelhardt* *Room 0/88*	WC 3 *Chair: F. Dias* *Room 1/82*
15:00-15:30	Coffee break *Lunch room*		
15:30-17:00	Parallel sessions - WD		
	WD 1 *Chair: E. Gaar* *Room 0/86*	WD 2 *Chair: S.Jayaswal* *Room 0/88*	WD 3 *Chair: P. Schiewe* *Room 1/82*
17:00-19:00	Welcome reception *Lunch room*		

Thursday, April 23

08:30-09:00	Welcome coffee *Lunch room*		
09:00-10:30	Parallel sessions - TA		
	TA 1 *Chair: M. Sinnl* *Room 0/86*	TA 2 *Chair: C. Aguayo* *Room 0/88*	TA 3 *Chair: J.De Boeck* *Room 1/82*
10:30-11:00	Coffee break *Lunch room*		
11:00-12:30	Parallel sessions - TB		
	TB 1 *Chair: C. Paquay* *Room 0/86*	TB 2 *Chair: P. Carroll* *Room 0/88*	TB 3 *Chair: R. Ronco* *Room 1/82*
12:30-13:30	Lunch *Lunch room*		
13:30-14:30	Keynote II - Jannis Kurtz		
14:30-15:00	Hexaly Sponsored Keynote *Chair: Arie Koster* *Room 0/86*		
15:30-18:30	Social activity *City center*		
19:30-23:00	Conference dinner *Atelier du Sélys*		

Friday, April 24

08:30-09:00	Welcome coffee *Lunch room*			
09:00-10:30	Parallel sessions - FA			
	FA 1 *Chair: G. Vanden Berghe* *Room 0/86*	FA 2 *Chair: N. Perrot* *Room 0/88*	FA 3 *Chair: A. Schneider* *Room 1/82*	FA 4 *Chair: E. Amaldi* *Room 0/89*
10:30-11:00	Coffee break *Lunch room*			
11:00-12:00	Keynote III - Angelika Wiegele			
12:00-12:15	Closing Session *Room 0/86* *Chair: Edoardo Amaldi*			
12:15-13:15	Lunch *Lunch room*			

Keynote I: Wednesday 9:30 - 10:30

William Cook
Department of Combinatorics and Optimization
University of Waterloo

The Traveling Salesman Problem: Package Deliveries, Pub Walks, and Astro Tours

Amazon drivers hit the road every day, each taking a delivery van in a traveling salesman problem (TSP) tour through 150 or more customer stops. Such instances can be readily solved to exact optimality, but the choice of route may be constrained by warehouse sorting operations, van-loading processes, driver preferences, and other considerations. We propose a simple and efficient penalty-based local search algorithm for route optimization in the presence of such constraints. The algorithm was used to win the $100,000 top prize in the Amazon Last Mile Routing Challenge, together with Stephan Held and Keld Helsgaun. We also describe recent progress on exact and approximate solutions to large-scale challenge instances of the TSP, including a shortest-possible walking tour to 81,998 bars in Korea and a 3D tour to 136,606,128 stars, guaranteed to be no more than 1.000144 times longer than a shortest-possible tour.

Keynote II: Thursday 13:30 - 14:30

Jannis Kurtz
Amsterdam Business School
University of Amsterdam

Explainable Optimization: New Perspectives and Challenges

In recent years, there has been a rising demand for transparent and explainable AI models. Although significant progress has been made in providing explanations for machine learning models, this topic has not received the same attention in the Operations Research (OR) community. However, algorithmic decisions in OR are made by complex algorithms which cannot be considered explainable or transparent as we will argue in this talk. We present two promising concepts to provide explanations for (integer) optimization problems. In the first part we introduce the concept of counterfactual explanations which asks the question: "How do the parameters of my problem have to be changed such that a different solution would be optimal". In the second part we present fast model-agnostic methods which attempt to explain any type of optimization algorithm (exact or heuristic) by calculating contribution scores for each relevant problem parameter.

Sponsored Presentation: Thursday 14:30 - 15:00

Hexaly
Platinum sponsor of the conference

`https://www.hexaly.com/`

Hexaly, a new kind of hybrid optimization solver

Hexaly Optimizer is a new kind of hybrid optimization solver. Its modeling interface is nonlinear and set-oriented. In a sense, Hexaly APIs unify and extend modeling concepts from mixed-linear programming, nonlinear programming, and constraint programming. Under the hood, Hexaly combines various exact and heuristic optimization methods, such as branch-and-bound, automatic Dantzig-Wolfe reformulation, column and row generation, propagation methods, local search, direct search, and surrogate modeling techniques.

Regarding performance benchmarks, Hexaly distinguishes itself against the leading solvers in the market, like Gurobi, IBM Cplex, and Google OR Tools, by delivering fast and scalable solutions to Routing, Scheduling, Packing, Clustering, and Location problems.

This talk will introduce our set-based modeling formalism and show its scalability for

large instances. We will then explore how the solver can use this formalism to automatically leverage state-of-the-art resolution techniques from both the exact and heuristic fields.

Keynote III: Friday 11:00 - 12:00

Angelika Wiegele
Institut für Mathematik
Alpen-Adria-Universität Klagenfurt

Semidefinite programming based bounds for the quadratic minimum spanning tree problem

In the quadratic minimum spanning tree problem (QMSTP), the goal is to minimize a quadratic objective over the set of all spanning trees of a graph. In this talk, we show how the QMSTP can be formulated as mixed-integer semidefinite program by exploiting the algebraic connectivity of the underlying graph. Based on these formulations, we derive a doubly nonnegative (DNN) relaxation of the QMSTP and introduce valid inequalities that strengthen this relaxation using the Chvátal–Gomory procedure for mixed-integer conic programming. We also present a variant of the Peaceman–Rachford splitting method that enables us to solve the DNN relaxation efficiently and obtain strong bounds for the QMSTP.

Joint work with Frank de Meijer, Melanie Siebenhofer and Renata Sotirov.

Detailed Program

Parallel Session WB – 11:00-12:30

Track WB-1 – Room 0/86

Chair: Nicolas Gillis

- A Learning Framework for Twin-Width and Related Problems

  Ryan O Connor, Johannes Meintrup, Maximilian Huber, Alexander Leonhardt, Manuel Penschuck, Yosuke Mizutani, Oscar Yeoh, and Deepak Ajwani

- Community detection via matrix factorization under the degree-corrected block model

  Alexandra Dache, Nicolas Gillis, and Arnaud Vandaele

- Soft classification trees: a decomposition algorithm with ILP-based sparsity and pruning

  Edoardo Amaldi, Antonio Consolo, and Filippo Gandini

Track WB-2 – Room 0/88

Chair: Marvin Weiler

- Towards 1-Resilient Local Fast Failover on Directed Graphs: Flip 1 Bit Once

  Erik van den Akker, Marvin Weiler, and Klaus-Tycho Foerster

- The Power of Symmetric Spanning Graphs in Public Transport

  Philine Schiewe, Irene Heinrich, Olli Herrala, and Piyalee Pattanaik

- Putting Tutte's counterexample to Tait's conjecture in perspective to (non-)Hamiltonicity in certain planar cubic graphs

  Enrico Iurlano, Herbert Fleischner, and Günther Raidl

Track WB-3 – Room 1/82

Chair: Yasemin Arda

- Balancing resource distribution for the healthcare districting problem

  Paulette Castillo, Sourour Elloumi, and Franco Quezada

- Energy-Aware Sequencing and Routing in Green Warehouses by Integrating Energy Management Systems and Renewable Energy

  Giacomo Lanza, Leena Aizdi, Mauro Passacantando, Maria Grazia Scutellà, Silvia Siri, and Stefano Bracco

- Models and Algorithms for the Consistent Travelling Salesman Problem with Vehicle Idling

  Juan José Salazar González and José Daniel Pascual Triana

Parallel Session WC – 13:30-15:00

Track WC-1 – Room 0/86

Chair: Walid Ben-Ameur

- Optimising peak cost over fractional temporally repeated flows

  Marius Schieren, Mariia Anapolska, and Christina Büsing

- Relaxations of the Delay-Constrained Maximum Concurrent Flow Problem

  Guillaume Beraud-Sudreau, Walid Ben-Ameur and Sébastien Martin

- Supportedness in Multi-Objective Minimum Cost Flow Problem: Representation Quality and Output-Sensitive Complexity

  David Könen and Michael Stiglmayr

Track WC-2 – Room 0/88

Chair: Felix Engelhardt

- On Robust Min-Cut and Max-Flow under Uncertainty

  Deniz Akkaya and Mustafa Pinar

- Robust optimization on partial network design problem

  Dimitri Hubans, Sonia Cafieri, and Laurent Houssin

- Robust Minimum Weight Perfect Matchings

  Monja Raschke, Felix Engelhardt, and Christina Büsing

Track WC-3 – Room 1/82

Chair: Fernando Dias

- Solving the Shortest Path Labeling Problem with Reactive GRASP for In-Network Intrusion Detection

  Edoardo Scalzo, Floriano De Rango, Francesca Guerriero, Antonio Iera, Mattia Giovanni Spina, and Giovanni Terremoto

- Minimum flow decompositions from multiassembly problems to line planning

  Philine Schiewe and Fernando Dias

- Characterizing Path-Length Matrices of Unrooted Binary Trees

  Roberto Ronco, Daniele Catanzaro, and Raffaele Pesenti

Parallel Session WD – 15:30-17:00

Track WD-1 – Room 0/86

Chair: Elisabeth Gaar

- Stronger and faster semidefinite programming bounds for the p-median Quadratic Facility Location Problem

  Alexandre Salles da Cunha and Dilson Lucas Pereira

- Mixed-integer programming approaches for the p-α-center Problem

  Sara Joosten, Elisabeth Gaar, and Markus Sinnl

- On mixed-integer programming approaches for the alpha-neighbor p-center problem

  Markus Sinnl and Elisabeth Gaar

Track WD-2 – Room 0/88

Chair: Sachin Jayaswal

- Exact approach for the 2-Vertex-Connected Star problem

  Louis Kurdyk, André Rossi, and Sonia Toubaline

- Advancing Security and Sustainability in Cost-Effective Multi-Band Flexible-Grid Optical Networks: Optimization Models and Algorithms

  Hadhbi Youssouf, Diarrassouba Ibrahima, and Mahjoub A. Ridha

- A Branch-and-Price Algorithm for Train Stop Scheduling Problem

  Faiz Hamid, Ankit Meshram, and Sachin Jayaswal

Track WD-3 – Room 1/82

Chair: Philine Schiewe

- k-Truss Minimization by Bilevel Optimization

  Arie Koster, Jonas Kreyer, Ivana Ljubić, and Matthis Penz

- Convex Recoloring through Integer Programming: Formulations, Valid Inequalities, and Computational Experiments

  Boyue Lin, Phablo Moura, and Roel Leus

- Identification and analysis of essential nodes via centrality measure and maximum cliques

  Fernando Dias and Joona Lindell

Parallel Session TA – 09:00-10:30

Track TA-1 – Room 0/86

Chair: Markus Sinnl

- Automated Benders-like Cut Generation and its Application to the Bilevel Network Design Problem

  Vladimir Stadnichuk and Arie M.C.A. Koster

- Overlapping decompositions of Virtual Network Embedding

  Alexis Schneider, Amal Benhamiche, Pierre Fouilhoux, Lucas Létocart, and Nancy Perrot

- Shortest Path Interdiction and Solution Diversity

  Felix Engelhardt

Track TA-2 – Room 0/88

Chair: Cristian Aguayo

- Drone-Based Emergency Response Network to Opioid Overdose

  Miguel Lejeune and Wenbo Ma

- Energy Community PV Facility Location Optimisation

  Paula Carroll, Debajyoti Biswas, and Dena Tayebi

- Valid Inequalities for the Vehicle Routing Problem with Drones

  Faiz Hamid and Yogesh Agarwal

Track TA-3 – Room 1/82

Chair: Jérôme De Boeck

- Accelerating Large-scale Network Capacity Planning via Set-cover-enhanced Benders Decomposition

  Eduardo Moreno, Babak Moazzez, Bruno de Backer, and Hugues Evrard

- Column Generation-Based Heuristic for the Sweep Coverage Problem

  Nicola Ronchini, Fabrizio Marinelli, and Andrea Pizzuti

- Joint Admission Control and Embedding of SFC Requests in a Stochastic Environment for Maximizing Network Revenue

  Daniela Cuesta, Olivier Brun, Matthieu Jonckheere, and Balakrishna Prabhu

Parallel Session TB – 11:00-12:30

Track TB-1 – Room 0/86

Chair: Célia Paquay

- A two-stage stochastic programming approach for the optimal sizing of a one-way station-based electric car sharing network

  Céline Gicquel, Christian Clavijo-Lopez, and Mouna Kchaou-Boujelben

- Two-Stage Fixed-Charge Transportation Problem: A Polyhedral Study

  Sachin Jayaswal, Gopal Saha, Guneshwar Anand, and Manu Kumar Gupta

- Arc-flow formulations for a multiple bin size dual bin packing problem for wood reuse

  Pauline Bessemans, Célia Paquay, and Morgane Dumont

Track TB-2 – Room 0/88

Chair: Paula Carroll

- A Three-Stage Meta-heuristic-Based Framework for Voltage Estimation in Low-Voltage Distribution Grids

  Eghbal Hosseini, Mohsen Banaei, Ahlam Jameel, Fraser O'Brien, and Razgar Ebrahimi

- A consolidation heuristic for a biobjective multimodal transportation planning problem

  Dominik Leib and Neele Leithäuser

- Bi-Objective Approach to Parametric Max-Flow Interdiction

  Simon Wirschem, Alexey Bochkarev, and Stefan Ruzika

Track TB-3 – Room 1/82

Chair: Roberto Ronco

- Finding a Smallest Discretization in Dynamic Discretization Discovery for Continuous-Time Service Network Design

  Alexander Helber and Tom Wüllner

- Bilevel Facility Location with Endogenous Queueing: An Application to EV Charging Network Design

  Yossiri Adulyasak, Weiquan Wang, Amira Dems, Okan Arslan, and Jean-François Cordeau

- On the complexity of degree-constrained network design problems

  Francesco Pisanu, Daniele Catanzaro, Gwenaël Joret, and Brieuc Pierre

Parallel Session FA – 09:00-10:30

Track FA-1 – Room 0/86

Chair: Greet Vanden Berghe

- A Multi-Period Vehicle Routing Problem with State-Dependent Service Times for Last-Mile Distribution Networks

  Christian Truden, Margaretha Gansterer, Dominic Loske, and Matthias Klumpp

- A Labeling Approach for the Electric Vehicle Routing Problem with Truck Driver Scheduling

  Louis Stubbe, Niels De Walsche, and Greet Vanden Berghe

- Towards Optimizing Fast Rerouting under Multiple Failures

  Stephanie Althoff and Klaus-Tycho Foerster

Track FA-2 – Room 0/88

Chair: Nancy Perrot

- A Generalized Voting Game for Categorical Network Choices

  Yueh Lin, Stefano Nasini, and Martine Labbé

- Energy-Efficient Function Chaining and Assignment for In-Network Learning

  Garance Gerard, Patient Ntumba Wa Ntumba, Safia Kedad-Sidhoum, Amélie Lambert, and Nancy Perrot

- Optimizing Regional Zero-Emission Bus Operations via Multi-Depot Electric Vehicle Scheduling

  Elisabeth Gaar, Xenia Haslinger, and Sophie N. Parragh

Track FA-3 – Room 1/82

Chair: Alexis Schneider

- Network Abstraction with Provisioning Guarantees for Multi-Domain Virtual Network Embedding

  Yanis Achaichia, Christelle Caillouet, Nicolas Huin, and Geraldine Texier

- Globally balanced paths for minimizing congestion in HPC networks

  Jan De Neve, Wouter Tavernier, Didier Colle, and Mario Pickavet

- Constrained-Sensors Data Collection with Unmanned Aerial Vehicle

  Luigi De Giovanni, Claudio Enrico Palazzi, and Lorenzo Perinello

Track FA-4 – Room 0/89

Chair: Edoardo Amaldi

- Optimal boarding and alighting operations in urban mass transit

  Laura Knappik, Lorena Silvana Reyes Rubiano, and Sven Müller

- On The Minimum-Weight Forward (Weakly) Fundamental Cycle Basis Problem in Directed Graphs

  Gabor Riccardi and Niels Lindner

- Thompson Sampling with Cumulative Oversampling for Budgeted Influence Maximization

  Zhen Xu, Xinjie Xing, and Shatian Wang