

3-5 June 2019, Seville (Spain)



VeRoLog Seville 2019



PTV GROUP











Dear VeRoLog 2019 participant,

On behalf of the Organizing Committee and of the Scientific Committee we are very pleased to welcome you to VeRoLog 2019, the Seventh Conference of the EURO Working Group on Vehicle Routing and Logistics Optimization. The VeRoLog conference is a meeting bringing together the large community of researchers and practitioners interested in vehicle routing optimization and its relationship with logistics.

The conference is open to high quality methodological contributions, relevant realworld applications, and case studies from industry and the service sector.

VeRoLog 2019 is taking place at Fundación Cajasol, Plaza de San Francisco, 1, 41004, Seville (Spain), affiliated center of Pablo de Olavide University in Seville from 3 to 5 June, 2019. The venue is located at the heart of Seville, behind the Town Hall of the city.

The conference will meet more than 220 participants interested in sharing their latest research findings, discussing your work, and attending the parallel sessions. In total, more than 170 scientific presentations have been included in the final programme of the conference. Furthermore, VeRoLog2019 includes two plenary lectures talks by JUAN JOSÉ SALAZAR (Full Professor at University of La Laguna) and MAURICIO G. C. RESENDE (Principal Research Scientist within Amazon.com), two tutorials by JESÚS SÁNCHEZ-ORO (Rey Juan Carlos University) and ROBERTO ROBERTI (VU University Amsterdam), and two brainstorming sessions by JOAQUIM GROMICHO (ORTEC) and WERNER HEID (PTV).

Special attention has been devoted to the activities of young researchers in our community that participate to the conference in large number; we will award the VeRoLog Doctoral Dissertation Prize, chosen among numerous applicants.

We would also like to highlight the VeRoLog Solver Challenge 2019 organized by ORTEC. Selected participants will have the possibility to present during the upcoming VeRoLog conference in Seville and to publish in a special issue of the journal Networks. The winning team receives \notin 2019, the second best \notin 500 and the third \notin 250. The organization and the prizes are provided by ORTEC and will be awarded during the VeRoLog conference.

Furthermore, we thank Bruce Golden and Manuel Laguna editors of Network and Journal of Heuristics, respectively, who will give the participants of the conference the possibility to submit a paper in one of the two Special Issues in these high-impact journals.

In addition to this jam-packed scientific program, we offer a series of social events to share some of the beautiful aspects of our city. A welcome reception on Sunday, June 2nd, is organized to give the participants the possibility to meet before the conference. On Monday evening, we invite you to visit the Real Alcázar de Sevilla, one of the oldest palaces in use of our time and on Tuesday evening, a social dinner is scheduled at restaurant La Casa del Estanque, in Jardines de las Delicias.

We are grateful for the generous support of the sponsors of VeRoLog 2019. These include academic partners, Pablo de Olavide University and EURO, as well as the industry partners: ORTEC and PTV Group, the strong and continued support of which attest to the relevance of this conference for those in industry. Particular sponsors that we would like to mention are qosiTconsulting, Flor M. Guerrero head of the Department of Economics, Quantitative Methods and Economic History at Pablo de Olavide University, Reyes Rey from the City Hall Tourist Office, D. Antonio Pulido and his amazing team (Encarnación Berrocal, María R. Varo) from Fundación Cajasol and Rafael Cebolla and his great team (Laura and Blanca) from Eventos Grupo Batura. Special thanks are also due to the VeRoLog board and the organizers of VeRoLog Amsterdam 2017 for their advice and guidance. We are indebted to them and want to extend the favour by offering the same support to the organizers of the next VeRoLog conference. Finally, we express our sincere thanks to the countless individuals that have contributed to VeRoLog 2019.

We hope that you will enjoy staying in Seville and attending the VeRoLog 2019 conference.

The Organizing Committee of VeRoLog 2019.

VeRoLog 2019 Committees

Organizing Committee

- Alfredo G. Hernández-Díaz (chair)
- Ana D. López-Sánchez
- Jesús Sánchez-Oro
- Eva Barrena Algara
- Laura Delgado
- Julián Molina
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the mind of movement











UNIVERSIDAD DE MÁLAGA



The Venue

The seventh meeting of the EURO Working Group on Vehicle Routing and Logistics optimization is taking place at Fundación Cajasol, Calle Chicarreros, 1, 41004, Sevilla (Spain), affiliated center of Pablo de Olavide University in Seville. The venue is located downtown behind the city council of Seville.

Seville is located in the South of Spain, the fourth largest city in Spain. It has more than 700,000 inhabitants, nearly half the population of the whole province. Seville is situated on the banks of the Guadalquivir River that has a rich Moorish heritage and used to be a prosperous port that carried out trade with the Americas. The old town of Sevilla covers almost four-square kilometers. Representative landmarks of Sevilla are the cathedral with its famous tower, La Giralda; the Royal Alcazar, a moorish palace which displays a beautiful mixture of Mudejar and Renaissance styles, and La Torre del Oro, a defensive barrier on the river to protect the river port.



PRACTICAL INFORMATION

Coffee breaks and lunches take place at the central Patio (ground floor).

EMERGENCY NUMBERS

The international phone number prefix for Spain is +34.

- Emergency call number (preferred): 112
- Police: 091
- Ambulance: 061
- Fire brigade: 080

SOCIAL PROGRAM

Sunday, June 2, 20:00-21:00

• Get-together/Registration at Maruja Melón in Paseo de Cristóbal Colón, 11, 41001 Seville, Spain 41001

Monday, June 3, 18:30-20:30

• Guided Tour of Real Alcázar in Patio de Banderas s/n Seville, Spain 41004

Tuesday, June 4, 21:00-00:00

• Gala Dinner at La Casa del Estanque (Jardines de las Delicias) in Paseo de las Delicias s/n Seville, Spain 41012

SCIENTIFIC PROGRAM: OVERVIEW			
	Monday, June 3 rd	Tuesday, June 4 th	Wednesday, June 5 th
8:15-9:00	Registration		
9:00-9:30	Opening Sesion	Tutorial	
9:30-10:30	Plenary	Brain Storming	Plenary
10:30-11:00	Coffee break	Coffee break	Coffee break
11:00-13:15	Drone	Bike and Vehicle Sharing	Special Session
	Real-Life VRPs	Heuristics	Capacitated VRP
	Exact Methods	Exact Methods	Waste Management
	City Logistics	City Logistics - Last Mile	Meta-heuristics
13:15-14:30	Lunch	Lunch	Lunch
14:30-16:20	Column Generation	City Logistics	Social Problems & other
	Dynamic VRPs	Meta-heuristics	Meta-heuristics
	Meta-heuristics	Electric VRPs	Facility Location
	TSP Variants and Green VRP	Solver Challenge	
	Scheduling	Dial-a-Ride	
16:20-16:40	Coffee break	Coffee break	Closing session
16:40-18:10	Special Session	Special Session	
	Freight Transportation	Supply Chain Management	
	Pickup and Delivery	& Inventory	
	Real-Life VRPs	Heuristics	
	Column Generation	Real-Life VRPs	
18:30-19:30	Guided tour		
19:30-20:30	Reales Alcázares		
21:00 - 00:00		Gala Dinner	

PLENARY TALK

Designing routes for vehicles and drivers

Monday, June 4, 9:30 - 10:30 (Room Antonio Machado) Chairman: Prof. Daniele Vigo (University of Bologna) Speaker: Prof. Juan José Salazar (University of La Laguna)

Most of the literature concerns the design of routes through customers for one resource (for example, a fleet of capacitated vehicles). However, it is quite common in real-world applications the need of optimizing more than one resources (for example, vehicles and drivers), both very interrelated but each one with different requirements. This talk will address some optimization problems in this category.

The motivation of our research started when solving an airline problem in Canary Islands operating about 150 flights (customers) every day. Each flight must be operated by one aircraft and one crew, and the problem is to compute optimal assignments (routes). There are eight airports in the islands, and two of them are hubs (Tenerife and Gran Canaria). To reduce overnight costs, a crew route must start and end in the same hub airport. Due to maintenance operations, each aircraft route must start and end in different hub airports. We will present different mathematical models and algorithms to find optimal routes detailed in "Omega" 43 (2014) 71-82 and "Transportation Science" 51 (2017) 250-268.

In the above problem, the flights are assumed to have a fixed departure time. We will also analyze the variant where these times can be slightly changed to find better solutions. This variant motivates a new problem where one must determine the time to start serving each customer, and design optimal routes for vehicles and drivers. In this problem synchronization constraints are crucial to guarantee feasibility of the solution. Note that in all these problems, each customer (flight) is visited (operated) by one vehicle and one driver. Although they are formulated and solved using standard elements in vehicle routing, they are scheduling problems in the sense that each customer is a task to be performed (for example, going from one airport to another airport). The new problem is called "Vehicle-and-Driver Scheduling Problem" and our research results are detailed in "Computers & Operations Research" 92 (2018) 56-64.

We will also introduce another new problem which is a more natural routing problem, in the sense that each customer is a location in the space, and some locations represents exchange locations where drivers exchange vehicles. The new problem is called "Driver-and-Vehicle Routing Problem" and our research results are detailed in "Computers & Operations Research" 81 (2017) 247-256.

PLENARY TALK

The importance of routing at Amazon.com

Wednesday, June 5, 9:30 - 10:30 (Room Antonio Machado) Chairman: Prof. Abraham Duarte (University Rey Juan Carlos) Speaker: Prof. Mauricio G.C. Resende (Amazon Delivery Technologies - AmDT)

Routing plays an important role within the logistics operations at Amazon.com. In this talk we describe some routing problems that arise at Amazon. These problems are related to, for example, first mile, middle mile, and last mile ground logistics, as well as global logistics and air cargo logistics.

TUTORIAL

Implementing efficient code without dying in the effort

Tuesday, June 5, 9:00 - 9:45 (Room 1&2) Chairman: Prof. Ana D. López-Sánchez (University Pablo de Olavide) Speaker: Prof. Jesús Sánchez-Oro (University Rey Juan Carlos)

We all agree that the success of a research work relies on the quality of the proposed algorithm. However, many times we are so focused on the algorithmic part of our work that we forget the relevance of implementing an efficient code to solve the problem. Indeed, a bad implementation of an effective algorithm may result in a disaster, since it will not be able to outperform previous works in reasonable computing time. Therefore, it is important to dedicate an important part of the research to select the correct data structures for solution representation, for instance.

In this tutorial we will start from a direct and inefficient solution for a well-known routing problem, and we will see some tips and tricks to increase the performance of the algorithm. We will analyze the complexity of the operations performed over the selected data structures in order to reduce the time complexity of the most used operations. Finally, once we have achieved an efficient version of the algorithm, we will focus on fast and simple parallelizations for the code, with the aim of taking advantage of the multiple processors available in every computer.

TUTORIAL

Multi-Trip Vehicle Routing Problems: Variants, Formulations, and Exact Methods

Tuesday, June 5, 9:00 - 9:45 (Room Antonio Machado) Chairman: Prof. Alfredo G. Hernández-Díaz (University Pablo de Olavide) Speaker: Prof. Roberto Roberti (Vrije Universiteit Amsterdam)

Multi-Trip Vehicle Routing Problems (MTVRP) generalize the well-known VRP by allowing vehicles to perform multiple trips per day. MTVRPs have received much attention lately because of their relevance in a variety of real-life applications, in particular in city logistics and last-mile delivery. Several variants of the MTVRP have been investigated, and a number of exact algorithms have been proposed. The literature indicates that different MTVRPs can be solved with different formulations, but it seems that none of the available formulations dominates the others from a computational viewpoint. Moreover, the complexity of MTVRPs can make instances with just 25 customers challenging to solve to optimality even when resorting to dedicated mathematical formulations.

In this tutorial, we will give an overview of the MTVRP variants studied in the literature and outline the main formulations highlighting corresponding advantages and limitations, both from a theoretical and a computational viewpoint. After motivating the need for additional research on MTVRPs, we will describe a novel formulation featuring an exponential number of variables and constraints. We will also describe an exact solution framework, based on this new formulation, we have recently proposed in Paradiso et al, An Exact Solution Framework for Multi-Trip Vehicle Routing Problems with Time Windows (forthcoming in Operations Research). This solution framework allowed us to solve instances with up to 50 customers, outperforming the state-of-theart methods for four variants of the MTVRP with Time Windows.

BRAINSTORMING SESSION

How appealing is an optimum?

Tuesday, June 4, 9:45 - 10:30 Chairman: Prof. Bruce Golden (University of Maryland) Speaker: Joaquim Gromicho (ORTEC)

We notice that drivers often deviate from the sequence of stops stipulated in the routes optimized for them. This results in higher mileage than planned and often in other forms of disruption, such as missing time windows or needing to unload cargo which is not yet freely reachable in the cargo bay. The latter increases delays. The bottom line is that the savings that our solutions promise on paper do not materialize because execution deviates from the plan.

One can say that optimal is not always appealing, which in the end leads to the optimum route not being executed. To the best of our knowledge, Diego Gabriel Rossit, Daniele Vigo, Fernando Tohmé and Mariano Frutos offer in their recent paper 'Visual attractiveness in routing problems: A review' a breakthrough in this area. Visual attractiveness is certainly appealing to planners. But is it also appealing to drivers? How can we improve the odds that our optimized routes are driven as planned?

BRAINSTORMING SESSION

You are so beautiful to me, why visual attractiveness in VRPs matters and what is it anyway?

Tuesday, June 4, 9:45 - 10:30 Chairman: Prof. Wout Dullaert (Vrije Universiteit Amsterdam) Speaker: Werner Heid (PTV Group)

Visually attractive routing plans are getting an increasing attention. Experience in practically relevant applications suggests that such solutions are preferred by managers, planners and drivers. The session will address various questions related to this observation.

- If beauty is in the eye of the beholder, how can we measure visual attractiveness objectively?

- If there is beauty in simplicity, what would simple plans and routes look like and besides, how can we obtain them?

- As minimum or near minimum-cost routing plans can look remarkably unattractive, do we even solve the right problem?

- Is beauty just an unnecessary necessity or are there practical benefits of visually attractive routes?

- Do autonomously driving vehicles still long for beautiful routes?

The questions shall help to stimulate a lively exchange and develop a deeper and more comprehensive understanding of this exciting concept.

Monday june 3rd, 2019

11:00 - 13:15

ANTONIO MACHADO	Drone
11:00 - 11:22	> Heuristic and dynamic programming for Parallel Drone Scheduling with Multiple Drones and Vehicles - <i>MBIADOU SALEU</i> <i>Gertrude Raïssa, Laboratoire d'Informatique, de Modélisation et d'optimisation des</i> <i>Systèmes</i>
11:22 - 11:44	A prototype of truck-drone route optimization based on agent modelling and simulation Jose M. Leon-Blanco, Industrial Engineering and Management Science, School of Engineering, University of Seville
11:44 - 12:06	 Drone and truck deliveries: solving the parallel drone scheduling traveling salesman problem Roberto Montemanni, Dalle Molle Institute for Artificial Intelligence (IDSIA-USI/SUPSI)
12:06 - 12:28	> TSP with one truck and one or multiple drones Kilian Seifried, Business School, University of Mannheim
12:28 - 12:50	The Mothership and Drone Routing Problem with Obstacles Stefan Poikonen, University of Colorado Denver Business School
12:50 - 13:12	An Arc Routing Problem with a fleet of drones Isaac Plana, Universidad de Valencia
Sala 1 & 2	Real-Life VRPs
11:00 - 11:22	 Optimisation of vessel routing for offshore wind farm maintenance tasks Toby Kingsman, STOR-i Centre for Doctoral Training, Lancaster University
11:22 - 11:44	 Decentralized dynamic task allocation and route planning for autonomous delivery vehicles in urban areas Katharina Glock, FZI Research Center for Information Technology
11:44 - 12:06	Fleet sizing and composition in grocery retailing Sara Martins, INESC TEC and Faculty of Engineering, Universidade do Porto
12:06 - 12:28	A mixed integer program for capacitated asset protection during escaped wildfire Delaram Pahlevani, RMIT University [Melbourne]
12:28 - 12:50	A bilevel approach for the collaborative and integrated transportation planning Maria Santos, INESC TEC [Porto], Faculdade de Engenharia [Porto]
12:50 - 13:12	> The Team Orienteering Problem with Overlaps: an Application in Cash Logistics Wout Dullaert, Vrije Universiteit, Amsterdam
Sala 7	City Logistics
11:00 - 11:22	> The generalized vehicle routing problem with Time Windows
	YUAN YUAN, Centre de Recherche en Informatique, Signal et Automatique de Lille (CRIStAL) - UMR 9189

- 11:22 11:44 > Vehicle Routing Problem with Flexible Drones Ilke Bakir, University of Groningen
- 12:06 12:28 → The electric fleet transition problem Samuel Pelletier, HEC Montréal

David Lai, VU Amsterdam

Marlin Ulmer, Technische Universität Braunschweig

Sala 5 Exact Methods

- > Valid Inequalities and a Branch-and-Cut Algorithm for multi-depot vehicle routing problems
- 11:00 11:22 Michiel Uit het Broek, Department of Operations, Faculty of Economics and Business, University of Groningen
 - > An exact algorithm for the agile earth observation satellite scheduling with timedependent profits
- 11:22 11:44 dependent profits Guansheng Peng, Catholic University of Leuven
- Decomposition approach for the distributionally robust vehicle routing problem with
 11:44 12:06 time window assignments
 Yossiri Adulyasak, HEC Montréal
 - The Urban Transit Network Design Problem
- 12:06 12:28 Alicia De Los Santos Pineda, Department of Statistics, Econometrics, Operational Research, Management Science and Applied Economics, University of Cordoba
- The Multi-period Multi-trip Containers Drayage Problem with Due and Release Dates
 12:28 12:50 Ornella Pisacane, Dipartimento di Ingegneria dell'Informazione, Università Politecnica delle Marche
- 12:50 13:12 > Exact solution methods for the multi-period vehicle routing problem with due dates Homero Larrain, Pontificia Universidad Católica de Chile

14:30 - 16:20

ANTONIO MACHADO Dynamic VRPs

- 14:30 14:52 > Dynamic Time Window Reassignment Kevin Dalmeijer, Econometric Institute, Erasmus University Rotterdam
- 14:52 15:14 The Dynamic Orienteering Problem Carlo Filippi, Department of Economics and Management - University of Brescia
- An Optimization Framework for Dynamic Multi-Skill Workforce Scheduling and
 15:14 15:36 Routing Problem
 Onur Demiray, Koç University

15:36 - 15:58	 Deadlock-free routing and scheduling of autonomously guided vehicles Markó Horváth, Institute for Computer Science and Control, Hungarian Academy of Sciences
15:58 - 16:20	Approximate Linear Programming for Dynamic Fleet Management David Sayah, FZI Research Center for Information Technology
Sala 1 & 2	Scheduling
14:30 - 14:52	 Robust Crew Recovery in Air Transportation: Reserve-Crew Scheduling to Mitigate Risks Evrim Ursavas, Department of Operations, Faculty of Economics and Business, University of Groningen
14:52 - 15:14	Heterogeneous resource scheduling and routing with order acceptance Meryem ILBEĞİ, TOBB University of Economics and Technology [Ankara]
15:14 - 15:36	 Scheduling of Intelligent and Autonomous Vehicles under pairing/unpairing collaboration strategy in container terminal: A branch-and-cut algorithm Jorge Riera-Ledesma, Departamento de Ingeniería Informática y de Sistemas, Universidad de La Laguna
15:36 - 15:58	Supply vessel planning with uncertain demand and weather conditions Irina Gribkovskaia, Molde University College - Specialized University in Logistics
15:58 - 16:20	 Interdependent Home Health Care and Social Care Problems Jésica de Armas, Universitat Pompeu Fabra [Barcelona]
Sala 7	Meta-heuristics
14:30 - 14:52	 Algorithms for the Pollution Traveling Salesman Problem Valentina Cacchiani, DEI, University of Bologna
14:52 - 15:15	 Optimizing workforce scheduling and routing problem with electric vehicles Seray Cakirgil, TOBB University of Economics and Technology
15:14 - 15:36	 Optimizing Onboard Catering Loading Locations and Plans for Airlines Seren Bilge YILMAZ, TOBB University of Economics and Technology [Ankara]
15:36 - 15:58	A Trilevel r-Interdiction Selective Multi-Depot Vehicle Routing Problem Deniz Aksen, Koç University
15:58 - 16:20	› Weekly planning in the broth and cream industry with several channels Joaquín Pacheco, University of Burgos; José Rubén Gómez, University of Burgos
Sala 5	Column Generation
14:30 - 14:52	Column selection by machine learning in exact branch-and-price algorithms Guy Desaulniers, Polytechnique Montreal and GERAD
14:52 - 15:14	A column generation approach for the driver scheduling problem with staff cars
	Shyam Sundar Govindaraja Perumal, Technical University of Denmark, QAMPO ApS
15:14 - 15:36	 Shyam Sundar Govindaraja Perumal, Technical University of Denmark, QAMPO ApS Branch-Cut-and-Price for Scheduling Deliveries with Time Windows in a Direct Shipping Network Timo Gschwind, Chair of Logistics Management, Gutenberg School of Management and Economics, Johannes Gutenberg University Mainz

15:58 - 16:20	 Stabilized Branch-Price-and-Cut for the Commodity-constrained Split Delivery Vehicle Routing Problem Stefan Irnich, Chair of Logistics Management, Gutenberg School of Management and Economics, Johannes Gutenberg University Mainz
Sala 3	TSP Variants and Green VRP
14:30 - 14:52	New Steiner Travelling Salesman Problem Formulation and its multi-depot extension Jessica Rodriguez-Pereira, HEC Montréal
14:52 - 15:14	 A Skewed VNS for solving a nonlinear optimization case: The Generalized Team Orienteering Problem Adolfo Urrutia, Universidad Politécnica de Madrid
15:14 - 15:36	 MILP formulations and Cutting Plane approaches for the Green Vehicle Routing Problem with Capacitated Alternative Fuel Stations. Maurizio Bruglieri, Dipartimento di Design, Politecnico di Milano
15:36 - 15:58	 Enhanced Multi-Directional Local Search for the Bi-Objective Heterogeneous Vehicle Routing Problem with Multiple Driving Ranges Majid Eskandarpour, IÉSEG School Of Management (LEM-CNRS 9221)
15:58 - 16:20	 Internalizing Negative Externalities in the Vehicle Routing Problem Javier Faulin, Istitute of Smart Cities, Public University of Navarra
	16:40 - 18:10
ANTONIO MACHADO	Special Session: Rich Routing and logistic (organized by GT2L)
16:40 - 17:02	Multi-period routing and battery charge scheduling for electric vehicles Jorge E. Mendoza, HEC Montréal
17:02 - 17:24	A column generation approach for the joint order batching and picker routing problem Maxime Ogier, Centre de Recherche en Informatique, Signal et Automatique de Lille (CRIStAL) - UMR 9189
17:24 - 17:46	Control of Autonomous Electric Fleets for Ridehail Systems Nicholas Kullman, Laboratoire d'Informatique de l'Université de Tours, Centre Interuniversitaire de Recherche sur les Réseaux dÉntreprise, la Logistique et le Transport
17:46 - 18:08	 > Branch-price-and-cut for the electric vehicle routing problem with stochastic travel times and battery consumption chance-constraints Alexandre Florio, Laboratoire dÍnformatique, de Modélisation et dÓptimisation des Systèmes, Ecole des Mines de Saint-Etienne
Sala 3	Freight Transportation
16:40 - 17:02	> Estimation of Disaggregated Freight Flows via a Real-Valued Genetic Algorithm Javier Rubio-Herrero, St. Mary's University
17:02 - 17:24	 A Branch-and-Cut-and-Price algorithm for the Two-Echelon Capacitated Vehicle Routing Problem Guillaume Marques, RealOpt, Institut de Mathématiques de Bordeaux, Laboratoire de líntégration, du matériau au système
17:24 - 17:46	Routing in air cargo networks Felix Brandt, FZI Research Center for Information Technology
17:46 - 18:08	The Vehicle Routing Problem with Private and Shared Delivery Locations

Simona Mancini, University of Cagliari

Sala 1 & 2 Real-Life VRPs

- 16:40 17:02 · Vehicle Routing Problem under Safe Distance Separation Constraints Hyunseop Uhm, Yonsei University
- 17:02 17:24 A Decision Support System for Attended Home Services Bruno P. Bruck, Universidade Federal da Paraí
- 17:24 17:46 Asset protection problem with uncertain time of wind change Iman Roozbeh, School of Science, RMIT University, Melbourne, Australia
 - Multiple vehicle synchronisation in a full truck-load pickup and delivery problem: a case-study in the biomass supply chain
- 17:46 18:08 Ricardo Soares, Faculty of Engineering of the University of Porto, Institute for Systems and Computer Engineering, Technology and Science

Sala 7 Pickup and Delivery

- 16:40 17:02 > Solution strategies for the vehicle routing problem with backhauls Anand Subramanian, Universidade Federal da Paraíba
 - A New Modeling of the Transportation Constraints in the RCPSP with Routing: Application to Healthcare Problems
- 17:02 17:24 Marina Vinot, Laboratoire d'Informatique, de Modélisation et d'optimisation des Systèmes
- Optimising drayage operations by combining column generation and branch-and-cut
 17:24 17:46 Robin Pearce, Vrije Universiteit Amsterdam [Amsterdam], University of Queensland [Brisbane]

> The pickup and delivery problem with time windows, multiple-stacks, and handling operations

17:46 - 18:08 Marilène Cherkesly, Université du Québec à Montréal - UQAM (CANADA), École des sciences de la gestion Université du Québec à Montréal, GERAD

Sala 5 Column Generation

- 16:40 17:02 > Route relaxations for the pickup and delivery problem with time windows Luciano Costa, Ecole Polytechnique de Montréal and GERAD
- 17:02 17:24 > Exact method for bi-objective vehicle routing problems Sandra Ulrich Ngueveu, Laboratoire d'analyse et d'architecture des systèmes [Toulouse]
- 17:24 17:46 > ng-Memory Based Capacity Cuts Ymro Hoogendoorn, Econometric Institute, Erasmus University Rotterdam
- 17:46 18:08 An exact solution method to the pollution routing problem Magnus Stålhane, Norwegian University of Science and Technology [Trondheim]

Tuesday june 4th, 2019

9:00 - 10:30

09:00 - 09:45	Tutorial: Implementing efficient code without dying in the effort
	Jesús Sánchez-Oro
09:00 - 09:45	Tutorial: Multi-Trip Vehicle Routing Problems: Variants, Formulations, and Exact

Methods *Roberto Roberti*

- 09:45 10:30 **Brainstorming:** How appealing is an optimum? Joaquim Gromicho
- 09:45 10:30 **Brainstorming:** You are so beautiful to me, why visual attractiveness in VRPs matters and what is it anyway? *Werner Heid*

11:00 - 13:15

ANTONIO	Heuristics
MACHADO	The Consistent Mehicle Deutine Deutine faire for a Distribution Firm
11:00 - 11:22	> The Consistent Vehicle Routing Problem for a Food Distribution Firm
11.77 - 11.44	Mining frequent patterns to drive the exploration of high-order neighborhoods
11.22 - 11.44	Florian Arnold, University of Antwerp
11:44 - 12:06	Avoidance of unnecessary demerging and remerging logistics flows
	Raymond Kwan, School of Computing, University of Leeds
12:06 - 12:28	Make it Quick: Speed-up Techniques for Solving the TSP
	Maša Avakumović, Helmut Schmidt University [Hamburg]
12:28 - 12:50	> Local search for the container relocation problem
	Fabien Tricoire, Johannes Kepler Universität Linz
12:50 - 13:12	> Enhancing Local Search Through Machine Learning: a Case Study on the Vehicle Routing Problem
	Daniele Viao. DFL University of Boloana
Sala 1 & 2	Bike and Vehicle Sharing
11:00 - 11:22	> The effect of spatial and temporal flexibility on the profitability of one-way electric
	carsharing systems
	Burak Boyaci, Lancaster University Management School, Centre for Transport and Logistics
11:22 - 11:44	 Optimized real-time management for on-demand ride sharing services.
	Zahra Ghandeharioun, Institute for Transport Planning and Systems (IVT)- ETH
	Zurich
11:44 - 12:06	> The pickup and delivery problem with online transfers, for the next generation of
	Gizem Ozbavajn, Faculty of Engineering and Natural Sciences, Sabanci University
12:06 - 12:28	 Handling Vehicle Relocation Through Layered graphs
	Alain Quilliot, Laboratoire d'Informatique, de Modélisation et d'optimisation des
	Systèmes, University Clermont Auvergne
12:28 - 12:50	 Comparing centralized and decentralized repositioning strategies for ride-sharing application
	Application Martin Douls E71 Research Center for Information Technology
12.50 - 13.12	Yredictive dynamic relocations in carsharing systems implementing complete
12.30 13.12	iourney reservations
	Martin Repoux, Ecole Polytechnique Fédérale de Lausanne

Sala 7 City Logistics - Last Mile

11:00 - 11:22	A Large Neighborhood Search approach to integrate delivery options in last mile
	delivery
	Dorian Dumez, Ecole des Mines de Nantes
11:22 - 11:44	Optimal vehicle routing with autonomous devices for last-mile delivery
	Ivana Ljubic, ESSEC Business School
11:44 - 12:06	> Using Mobile Pick-up Stations for Last-Mile Deliveries
	Tino Henke, Otto-von-Guericke University Magdeburg
12:06 - 12:28	> Integration of Vehicles and Drones in Last Mile Delivery
40.00 40.50	Necati Aras, Department of Industrial Engineering, Bogazici University
12:28 - 12:50	A Location-Routing Problem with Delivery Options and Time-Windows for the Last
	Mile Delivery of Fresh Products
12.50 12.12	Sonju Ronmer, wageningen University - Operations Research and Logistics
12.30 - 13.12	Christian Tilk, Chair of Logistics Management, Cutenhera School of Management
	and Economics Johannes Gutenberg University Mainz
	and Economics, Johannes Gatenberg Oniversity Mainz
Sala 5	Exact Methods
11.00 - 11.22	A Branch-and-Check Approach for a Tourist Trip Design Problem with Rich
11.00 11.22	Constraints
	Vu Duc Minh. Laboratoire dÍnformatique Fondamentale et Appliquée de Tours
11:22 - 11:44	> Improved branch-and-cut algorithm for the inventory routing problem
	Jørgen Skålnes, Norwegian University of Science and Technology [Trondheim]
11:44 - 12:06	A Branch and-Cut Algorithm for the Distance Constrained Close-Enough Arc
	Routing Problem
	Miguel Reula Martín, Universidad de Valencia
12:06 - 12:28	A Branch-and-Price Algorithm for a Vehicle Routing-allocation Problem
	Mohammad Reihaneh, IÉSEG School Of Management [Paris]
12:28 - 12:50	Stronger bounds for the asymmetric traveling salesman problem
	Safa Ben Salem, Université de Tunis, Tunis Business School, Business Analytics and
	Decision Making
12:50 - 13:12	A Periodic Multi-Vehicle Arc Routing Problem
	Demetrio Laganà, Department of Mechanical, Energy and Management
	Engineering
ΔΝΙΤΟΝΙΟ	14:30 - 10:20 Special Session: Solver Challenge (organized by ORTEC)
ΜΔCΗΔDO	Special Session. Solver Chanenge (organized by OKTEC)
14.30 - 14.52) The VeRol og Solver Challenge 2019
1100 1102	Pim van 't Hof. ORTEC B.V.
14:52 - 15:14	> Using the Optaplanner solver
	Raúl Martín Santamaría, Universidad Rey Juan Carlos [Madrid]
15:14 - 15:36	> Matheuristics for the 2019 VeRoLog Solver Challenge: MIPs and Bits
	Caroline Jagtenberg, University of Auckland
15:36 - 15:58	> An Adaptive Large Variable Neighborhood Search for a Combined Vehicle Routing
	and Scheduling Problem
	Benjamin Graf, Osnabrück University
15:58 - 16:20	A contribution to the VeRoLog Solver Challenge 2019
	Martin Josef Geiger, Helmut-Schmidt-University, University of the Federal Armed
	Forces Hamburg
Sala 1 & 2	Meta-heuristics
14:30 - 14:52	> Optimizing the Location of Incident Response Vehicles for Congestion Mitigation
	Gușta Dilaver, TOBB University of Economics and Technology [Ankara]
14:52 - 15:14	A Hybrid Solution Method for the Vehicle Routing Problem with Locker Boxes
	μανιμή αταρεπικριώνεια τη υπινείδην οι νιεπίδα

Jasmin Grabenschweiger, University of Vienna15:14 - 15:36> A Method for 1-M-1 Pickup and Delivery Problem with Robust Paths

Islam Altin, Eskisehir Osmangazi University 15:36 - 15:58 > Production and delivery problem with late departure and tardiness penalties Hugo Chevroton, Laboratoire dÍnformatique Fondamentale et Appliquée de Tours 15:58 - 16:20 > Home Chemotherapy Planning: An Integrated Production Scheduling and Multi-Trip Vehicle Routing Problem Diego Cattaruzza, Centre de Recherche en Informatique, Signal et Automatique de Lille

Sala 5 Electric VRPs

14:30 - 14:52	\rightarrow Electric Vehicle Routing Problem with Time Windows and Stochastic Waiting Times at Recharging Stations
	Merve Keskin, Warwick Business School
14:52 - 15:14	A Branch-and-Price Solution Approach for Electric Vehicle Routing Problems with
	Time Windows
	Ece Naz Duman, Ece Naz Duman
15:14 - 15:36	> Electric Arc Routing
	Mario Ruthmair, University of Vienna
15:36 - 15:58	> Benchmarking dispatching approaches for a fleet of urban autonomous delivery
	vehicles by solving the EVRPTW minimizing tardiness
	Anne Meyer, TU Dortmund University

15:58 - 16:20 An Electric Vehicle Routing Problem with Flexible Time Windows Duygu Taş, MEF University

Sala 3 Dial-a-Ride

14:30 - 14:52	> Integrating the use of public transport in dial-a-ride services	
	Kris Braekers, Hasselt University	

- 14:52 15:14 > Integrating Dial-a-Ride with Mode Choice Xiaotong Dong, University of New South Wales [Sydney]
- 15:14 15:36 A Learning Large Neighborhood Search for the Dynamic Electric Autonomous Dial-A-Ride Problem

Claudia Bongiovanni, Ecole Polytechnique Federale de Lausanne (EPFL)

- 15:36 15:58 > Exact formulation for the dial a ride problem with transfers Jacopo Pierotti, Delft Institut of Applied Mathematics
- 15:58 16:20 > Fair collaboration scheme for firms operating dial-a-ride services in a city network Valentina Morandi, Freie Universität Bozen

16:40-18:10

ANTONIO MACHADO	Special Session: Rich Routing and logistic (organized by GT2L)
16:40 - 17:02	 Multiple solve approaches applied to the Heterogeneous Vehicle Routing Problem Gwénaël Rault, Université de Bretagne Sud, Mapotempo
17:02 - 17:24	A Demon Algorithm for the Vehicle Routing Problem with Cross-Docking Gültekin Kuyzu, Zaragoza Logistics Center, TOBB University of Economics and Technology
17:24 - 17:46	> Efficient Constraint Programming Approaches for routing problem : a case study for the VRP
	Bourreau Eric, Laboratoire dÍnformatique de Robotique et de Microélectronique de Montpellier - philippe lacomme, Laboratoire dÍnformatique, de Modélisation et dÓptimisation des Systèmes, Laboratoire d'Informatique, de Modélisation et d'optimisation des Systèmes - Gondran Matthieu, Laboratoire dÍnformatique, de Modélisation et dÓptimisation des Systèmes
17:46 - 18:08	 Constraint Programming approaches for the Inventory Routing Problem Philippe Lacomme, Laboratoire d'Informatique, de Modélisation et d'Optimisation des Systèmes

Sala 1 & 2 Real-Life VRPs

- 16:40 17:02 > Routing drones in the interior of a factory using a new version of the VRP Ivan derpich, Departamento de Ingeniería Industrial, Universidad de Santiago de Chile [Santiago]
- 17:02 17:24 A Template-based ALNS for the Consistent E-VRP with Backhauls and Charging Management
 - Pamela Nolz, AIT Austrian Institute of Technology
- 17:24 17:46 > A New Distribution Paradigm: Delivery of Medicines by Drone Tânia Ramos, Centro de Estudos de Gestão, Instituto Superior Técnico, Universidade de Lisboa
- 17:46 18:08 > A Branch-and-Price Algorithm for a Delivery Network Using Autonomous Robots Stefan Schaudt, Department of Transport Logistics

Sala 7 Heuristics

- 16:40 17:02 > On simple heuristics for the cumulative TSP Mengke WANG, Warwick Business School
- 17:02 17:24 > Optimizing routing and delivery patterns with multi-compartment vehicles Manuel Ostermeier, Technical University of Munich
- 17:24 17:46 > A two-stage solution approach for the directed rural postman problem with turn penalties Xingyin Wang, Singapore University of Technology and Design - Engineering Systems and Design
- 17:46 18:08 > A Kernel Search Heuristic for the Multi-Vehicle Inventory Routing Problem Gianfranco Guastaroba, Department of Economics and Management - University of Brescia

Sala 5 Supply Chain Management and Inventory Routing

Wenjuan Gu, Centre de Recherche en Informatique, Signal et Automatique de Lille

- 17:02 17:24 > Solution Approaches for the Consistent Stochastic Inventory Routing Problem Emilio Jose Alarcon Ortega, University of Vienna
- 17:24 17:46 > Managing stochastic supply and demand in an inventory routing problem Aldair Alvarez, Federal University of São Carlos
- 17:46 18:08 > A branch-price-and-cut algorithm for the inventory routing problem with time windows

Esra Koca, Faculty of Engineering and Natural Sciences, Sabanci University

Wednesday, June 5th 2019

9:30 - 10:30

09:30 - 10:30 Plenary: The importance of routing at Amazon.com - Mauricio G. C. Resende

11:00 - 13:15

antonio Machado	Special Session: Time-Dependent Vehicle Routing Problem
11:00 - 11:22	> The Mixed Capacitated General Routing Problem with Time-Dependent Demands Chahid ahabchane, Polytechnique Montréal, Centre Interuniversitaire de Recherche sur les Réseaux d'Entreprise, la Logistique et le Transport
11:22 - 11:44	> The Time-Dependent Shortest Path and Vehicle Routing Problem Rabie Jaballah, Laboratoire CIRRELT Université Laval Quebec
11:44 - 12:06	> The Vehicle Routing Problem with Time Windows and Time-Dependent Road-Network Information Dominique Feillet, Ecole des Mines de Saint-Etienne, Laboratoire d'Informatique, de Modélisation et d'optimisation des Systèmes
12:06 - 12:28	> Time-dependent scheduling with replenishable resources Steffen Pottel, Kühne Logistics University - Asvin Goel, Kühne Logistics University
12:28 - 12:50	> Determining time-dependent minimum cost paths under several objectives Hamza Heni, Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT), Centre d'innovation en logistique et chaîne d'approvisionnement durable, Canada Research Chair in Integrated Logistics, Faculty of Business Administration, Laval University - Leandro C. Coelho, Canada Research Chair in Integrated Logistics, Faculty of Business Administration, Laval University, Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT) - Jacques Renaud, Centre d'innovation en logistique et chaîne d'approvisionnement durable, Faculty of Business Administration, Laval University, Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT)
12:50 - 13:12	An enhanced lower bound for the Time-Dependent Traveling Salesman Problem Emanuela Guerriero, Università del Salento - Dipartimento di Ingegneria dell'Innovazione
Sala 1 & 2	Capacitated VRP
11:00 - 11:22	> An inventory routing problem with prioritized deliveries Paulina Avila, Universidad de las Américas [Puebla] - Nancy Arratia Martínez, Universidad de las Américas [Puebla]
11:22 - 11:44	A metaheuristic for the inventory routing problem with divisible pickup and delivery Simen Vadseth, Norwegian University of Science and Technology [Trondheim]
11:44 - 12:06	 Heuristic for the dynamic scheduling of a fleet of drones for sport filming in a wide field of operations José L. Andrade-Pineda, Robotics, Vision and Control Group, Group of Robotics, Vision and Control
12:06 - 12:28	A branch-and-cut algorithm for the soft-clustered vehicle routing problem Katrin Hessler, Chair of Logistics Management, Gutenberg School of Management and Economics, Johannes Gutenberg University Mainz
12:28 - 12:50	> Branch-cut-and-price algorithms for the vehicle routing problem with backhauls Ruslan Sadykov, Institut de Mathématiques de Bordeaux, RealOpt

12:50 - 13:12	A Heuristic Algorithm for the Undirected Capacitated General Routing Problem with Profits Annarita De Maio, Department of Mechanical, Energy and Management Engineering, University of Calabria
Sala 7	Waste Management
11:00 - 11:22	 The Cumulative Capacitated Arc Routing Problem Sergio Andrés Lenis, Universidad EAFIT
11:22 - 11:44	Recyclable Waste Collection Routing Problem, formulation and solution José Andrés Moreno Pérez, University of La Laguna, Universidad de La Laguna
11:44 - 12:06	 Routing, scheduling and fleet composition for municipal solid waste collection: Multiple types of waste and single compartment vehicles Dušan Hrabec, Tomas Bata University in Zlín
12:06 - 12:28	 Waste Collection with Route Balancing Concerns: A real-world application Ana Raquel de Aguiar, Centro de Estudos de Gestão, Instituto Superior Técnico, Universidade de Lisboa
12:28 - 12:50	> An interactive method for multiobjective routing problems Delgado-Antequera Laura, Departamento de Economía Aplicada (Matemáticas), Universidad de Málaga
12:50 - 13:12	› A two - steps heuristic for a multi-objective waste collection problem Rafael Martí, Universidad de Valencia
Sala 5	Meta-heuristics
11:00 - 11:22	> The Clustered Heterogeneous Vehicle Routing Problem with relaxed priority rules Tan DOAN, Laboratoire des Sciences du Numérique de Nantes
11:22 - 11:44	 The PDP with alternative locations and overlapping time windows Alina-Gabriela Dragomir, University of Vienna
11:44 - 12:06	A Large Neighborhood Search for the Active-Passive Vehicle Routing Problem Biljana Roljic, University of Vienna, Faculty of Business, Economics and Statistics
12:06 - 12:28	› Consistent-DARP Samuel Vercraene, Décision et Information pour les Systèmes de Production
12:28 - 12:50	A new approach to solve the demand weighted vehicle routing problem J. Manuel Colmenar, Universidad Rey Juan Carlos [Madrid]
12:50 - 13:12	A solution method for k-mldp and some comparatives Julián Molina, Universidad de Málaga [Málaga]
	14:30 - 16:20
ANTONIO MACHADO	Meta-heuristics
14:30 - 14:52	> A meta-heuristic approach for the Vehicle Routing Problem with occasional drivers Raúl Martín Santamaría, Universidad Rey Juan Carlos [Madrid]
14:52 - 15:14	Solving order batching and picker routing, as a clustered vehicle routing problem Babiche Aerts, University of Antwerp
15:14 - 15:36	The on-demand bus routing problem: the importance of bus stop assignment Lissa Melis, University of Antwerp

15:36 - 15:58 Picking location metrics for order batching on a unidirectional cyclical picking line Flora Hofmann, Department of Logistics [Stellenbosch]

> Simheuristics for Stochastic Vehicle Routing Problems: a review and open challenges

15:58 - 16:20 Leandro Martins, Universitat Oberta de Catalunya - Angel juan, Universitat Oberta de Catalunya

Sala 1 & 2 Facility Location

- 14:30 14:52 > The Bi-objective p-Center and p-Dispersion problem Sergio Pérez-Peló, Universidad Rey Juan Carlos [Madrid]
- > Criterion space search methods for a bi-objective facility location problem in the 14:52 15:14 presence of uncertainty
 - Najmesadat Nazemi, University of Linz
- 15:14 15:36 > Methods for Solving Problems in Urban Air Mobility Eric Oden, University of Maryland - Department of Mathematics
- 15:36 15:58 > The Bi-objective p-Median and p-Dispersion problem Juan David Quintana Pérez, Universidad Rey Juan Carlos
- 15:58 16:20 > Heuristics for the multi row facility layout problem considering facilities of equal length Abraham Duarte, Universidad Rey Juan Carlos [Madrid]

Sala 7 Social Problems and other related Routing Problems

- 14:30 14:52 Setting a Maximum Capacity Network and Sharing its Cost.
- Andrés Caro, Pablo de Olavide University, of Seville

> A Dynamic Discretization approach to the integrated Service Network Design and

- 14:52 15:14 Vehicle Routign Problem Fabien Lehuédé, Laboratoire des Sciences du Numérique de Nantes, IMT Atlantique
- 15:14 15:36 Considering Parking Areas in Route Planning for Truck Drivers Frank Schulz, PTV Group

> Heuristic approach to solve a tandem truck-dron logistic delivery problem

- 15:36 15:58 Pedro L. Gonzalez-R, Industrial Engineering and Management Science, School of Engineering, University of Seville - David Canca Ortiz, Industrial Engineering and Management Science, School of Engineering, University of Seville
- 15:58 16:20 The tail routing problem in air transportation
- Manuel Fuentes, Universidad Rey Juan Carlos [Madrid]