## Conference Program

### Conference Schedule at a Glance

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<tr>
<th>Time</th>
<th>Monday, September 28, 2020</th>
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<tr>
<td>13:00-13:30</td>
<td>Welcome</td>
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</table>
| 13:30-15:00   | Collaborative freight transport  
Maritime case studies  
Public transport |
| 15:00-15:15   | Break                                           |
| 15:15-16:15   | Plenary prof. Warren Powell:  
Automating Transportation and Logistics in the Digital Age: Past, present and future challenges |
| 16:15-16:30   | Break                                           |
| 16:30-18:00   | Inventory routing  
Trains & barges  
Cooperation in transport |

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<tr>
<th>Time</th>
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| 10:30-12:00   | Dynamic VRPs  
Yard operations  
Shared mobility |
| 12:00-13:00   | Lunch                                           |
| 13:00-14:30   | Rich VRPs  
Automated transport  
Mobility & positioning |
| 14:30-14:45   | Break                                           |
| 14:45-16:15   | Inventory routing 2  
Port operations  
Warehousing & e-commerce |
| 16:15-16:30   | Break                                           |
| 16:30-18:00   | Exact routing approaches  
Synchronodal transport  
Routes & travel times |

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<th>Time</th>
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| 13:00-14:30   | Sustainable transport  
Uncertainty in freight transport  
Markov Decision Processes |
| 14:30-14:45   | Break                                           |
| 14:45-15:45   | Plenary prof. Rob Zuidwijk:  
Container transport: innovative practices meet academic discourse |
| 15:45-16:00   | Break                                           |
| 16:00-17:30   | Fleets, vehicles & transfers  
Intermodal transport  
Bin packing |
| 17:30-18:00   | Closing                                          |
Monday, September 28, 2020

13:00-13:30 Welcome
13:30-15:00 Parallel sessions

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<tr>
<td><strong>Chair</strong>: Nadia Pourmohammadzia</td>
<td><strong>Chair</strong>: Lennart C. Johnsen</td>
<td><strong>Chair</strong>: Stefan Voß</td>
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15:00-15:15 Break
15:15-16:15 Plenary talk

**Prof. Warren Powell: Automating Transportation and Logistics in the Digital Age: Past, present and future challenges. Chair: Martijn Mes**

Amazon and Uber have shown the way to the digital era in transportation and logistics in the post-2000 era, exploiting the power of the internet and the explosive growth in the use of smartphones. Less visible is the growth of major freight companies such as UPS, DHL, FedEx, along with major shipping companies such as Maersk and domestic postal services. Today, there is an explosion of services that require fast delivery of products and services with 2-day, same-day and real-time response.

Today, we are looking at the possibility of fully-digital transportation operations, where people primarily monitor systems while computers perform all the “thinking” tasks previously performed by people. We have become accustomed to using statistical models and machine learning to perform inference and prediction. The next phase will be using computers to make decisions, especially those implemented in an operational setting.

I will talk about the evolution of modern analytics in transportation and logistics, beginning with network models and heuristics in the 1970s and 1980s, and the emergence of powerful deterministic optimization solvers in the 1980’s and 1990’s. Throughout this period, transportation companies have had to deal with uncertainty, but only recently have we started to develop the type of general modeling frameworks long enjoyed by deterministic optimization. I will give the highlights of this framework, and then bring out the challenges that still remain in the path to full automation.

16:15-16:30 Break
16:30-18:00 Parallel sessions

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<tr>
<td><strong>Chair</strong>: Michael Römer</td>
<td><strong>Chair</strong>: Janis S. Neufeld</td>
<td><strong>Chair</strong>: Wouter van Heeswijk</td>
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<tr>
<td>Inventory routing in a city logistics context: review and collaborative model. Titì Iswari, Kris Braekers and An Caris (78)</td>
<td>An Ant Colony Optimisation vs. a Branch and Bound Approach for the Robust Train Marshalling Problem. Abtin Nourmohammadzadeh and Stefan Voß (80)</td>
<td>Introducing Cooperativeness for Agrobotics: An Agent-Based Approach. Stef Bunte (84)</td>
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¹ Special session on Collaborative Freight Transportation
**Dynamic VRPs**

**Chair: Frank Meisel**

- The Multistage Stochastic Vehicle Routing Problem with Dynamic Occasional Drivers. Jørgen Skálnes, Lars Dahle, Henrik Andersson, Marielle Christiansen and Lars Magnus Hvattum (58)
- Eco-Labeling in Dynamic Vehicle Routing as a Markov Decision Process. Arne Heinold and Frank Meisel (77)

**Yard operations**

**Chair: Shunjii Tanaka**

- An optimization model for defining the storage strategies for an export yard in container terminals: a case study. Daniela Ambrosino and Haoqi Xie (64)
- Extended tree-based Properties and Heuristics for the Preemptive Stacker Crane Problem. Benjamin Graf (76)
- An improved branch-and-bound algorithm for the block relocation problem to minimize total working time under a realistic crane trajectory model. Shunjii Tanaka and Akira Shikida (38)

**Shared mobility**

**Chair: Breno Beirigo**

- Formulations of a carsharing pricing and relocation problem. Giovanni Pantuso (4)
- Dynamic Pricing for User-Based Rebalancing in Free-Floating Vehicle Sharing: A Real-World Case. Nout Neijmeijer, Frederik Schulte, Kevin Tiemey, Henk Polinder and Rudy Negenborn (60)
- Overcoming Mobility Poverty with Shared Autonomous Vehicles: A Learning-Based Optimization Approach for Rotterdam Zuid. Breno Beirigo, Frederik Schulte and Rudy Negenborn (71)

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**Rich VRPs**

**Chair: Simona Mancini**

- Solving a Bi-Objective Rich Vehicle Routing Problem with Customer Prioritization. Tim van Benthem, Mark Bergman and Martijn Mes (33)
- Metaheuristic Approaches for the Step Cost Functions in a Fleet Size and Mix Vehicle Routing Problem with Time Windows. João Manguino and Débora Roncari (51)

**Automated transport**

**Chair: Frederik Schulte**

- Introducing smart yards: a new concept in smart transport logistics. Jelle van Heuveln (85)
- Automated and Autonomous Driving in Freight Transport - Opportunities and Limitations. Joachim R. Daduna (61)

**Mobility & positioning**

**Chair: Xiaoning Shi**

- Idle vehicle repositioning for dynamic ride-sharing. Martin Poulos, Anne Meyer and Ninit Ahuja (8)
- Minimizing Movements in Location Problems with Mobile Recycling Units. Eduardo Alarcon-Gerbier and Udo Buscher (43)
- Smart City: A Perspective of Emergency and Resilience at a Community Level in Shanghai. Xiaoning Shi, Wenchen Sun, Stefan Voß and Jiangan Jin (66)

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**Inventory routing 2**

**Chair: William Guerrero**

- Distance Approximation for Dynamic Waste Collection Planning. Fabian Akkerman, Martijn Mes and Wouter Heijnen (24)
- Cash Distribution Model with Safety Constraints. William Guerrero, Ángelica Sarmiento and Cristian Martinez (72)

**Port operations**

**Chair: Kjetil Fagerholt**

- A self-adaptive hybrid search technique using the integration of two intelligent crossover operators and an augmented local search for solving the quadratic semi-assignment problem. Mehrdad Amirghasemi, Reza Zamani and Stefan Voß (82)
- New formulation and solution algorithm for the Strategic Berth Template Problem. Elena Fernández and Manuel Múñoz-Marquez (93)

**Warehousing & e-commerce**

**Chair: Kris Braekers**

- Game Theoretic Analysis of State Interventions to Reduce Customer Returns in E-commerce. Maria Beranek (6)
- Increasing the practical applicability of order picking operations by integrating classification, labelling and packaging regulations. Sarah Vanheusden, Teun van Gils, Katrien Ramaekers and An Caris (34)
- Online integrated order batching, picker routing and picker scheduling in a warehouse. Ruben D’Haen, Kris Braekers and Katrien Ramaekers (83)

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2 Special session on Shared (Autonomous) Mobility
Wednesday, September 30, 2020

13:00-14:30 Parallel sessions

### Sustainable transport
**Chair: Rosa González-Ramírez**
- A Genetic Algorithm to Minimise Number of Vehicles in Electric Vehicle Routing Problem. *Bertran Queck and Hoang Chuan Lau* (40)
- Pricing and Quality Investments: An environmental and economic dilemma. *Arka Mukherjee and Margarida Carvalho* (32)

### Uncertainty in freight transport
**Chair: Bilge Atasoy**
- Fair User Equilibrium in a Transportation Space-Time Network. *Lianne Bruijns, Frank Philippson and Alex Sangers* (17)
- Simulation Approach for Container Assignment under Uncertainty. *Wouter de Koning, Frank Philippson and Irina Chiscop* (41)
- Robust optimization for premarshalling with uncertain priority classes. *Sven Boge, Marc Goerigk and Sigrid Knust* (81)

### Markov Decision Processes
**Chair: Wouter van Heeswijk**
- Dynamic programming for the time-dependent traveling salesman problem with time windows. *Gonzalo Lera Romero, Juan José Miranda Bront and Francisco Soulignac* (92)
- Sending e-commerce returns straight to the next customer with MCTS and ADP. *Eline Tetteroo and Carl Van Heijst* (37)
- Deep Reinforcement Learning and Optimization Approach for Multi-echelon Supply Chain with Uncertain Demands. *J. C. Alves and G. R. Mateus* (56)

14:30-14:45 Break

14:45-15:45 Plenary talk

**Prof. Rob Zuidwijk: Container transport: innovative practices meet academic discourse. Chair: Eduardo Lalla**

The international transport of maritime containers employs multiple transport means, such as deep-sea vessels and trucks, or alternatively river barges and train sets. The planning and execution of combined transport operations is challenging, since resources are to be orchestrated efficiently while delivery of service must be reliable. To address these challenges, the port of Rotterdam and its hinterland have become a living laboratory, where practitioners are performing pilot studies and academics develop new methods to put innovative logistics concepts to the test.

In the presentation, I will discuss how Synchronodal transport solutions offer mobility of freight instead of specific transport capacity. Containers that need to be transported are matched with transport options in a dynamic way. Practitioners have demonstrated the feasibility of the concept, while academics have elaborated on various decision models in support of e.g. network design, capacity planning, and routing. The living lab now progressively involves new modes of transport, such as semi-automated trucks that dynamically form platoons where consolidation is viable.

Advanced planning concepts, where multiple modes of transport are involved, tend to be more data intensive. However, the transportation industry is progressively recognizing the value of data as a strategic asset, not to be shared without compensation. Therefore, a proper understanding of what data is needed to enhance quality of planning is key. In some cases, a marginal improvement of data quality may already help create better prognostics and planning. In this vein, academics have been able to feed their methods and insights back to practitioners. As such, container transport connects innovative practices and academic discourse.

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### Exact routing approaches
**Chair: Kevin Tierney**
- An integer programming model for a food distribution problem with trucks and deliverymen. *Claudio Sandoval, Giovanni Campuzano and Germán Paredes-Belmar* (90)
- An Integer Programming approach for the Traveling Salesman Problem with release dates and completion time minimization. *Agustin Montero, Isabel Mendez-Diaz and Juan José Miranda-Bront* (74)
- A Mathematical Model to Route Technicians for Inland Waterway Shipping. *Melissa Buballa, Daniel Wetzel, Kay Lenkenhoff and Kevin Tierney* (42)

### Synchronodal transport
**Chair: Thibault Delbart**
- Learning-based co-planning for improved container, barge and truck routing. *Rie Larsen, Bilge Atasoy and Rudy Negenborn* (63)
- Uncertainty in intermodal and synchronodal transport. *Thibault Delbart, Yves Molenbruch, Kris Braekers and An Caris* (91)

### Routes & travel times
**Chair: Rhyd Lewis**
- Evolutionary approach for the multi-objective bike routing problem. *Pedro Nunes, Ana Moura and José Santos* (11)
- Travel Time Prediction using Tree-Based Ensembles. *He Huang, Martin Pouls, Anne Meyer and Markus Pauly* (44)

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3 Special session on Behavior and Uncertainty in Freight Transport
15:45-16:00  Break
16:00-17:30  Parallel sessions

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17:30-18:00  Closing