

Program:

## 4<sup>th</sup> Last-Mile Delivery Workshop

Location: Cyberspace

Date: Friday June 19, 2020

### Contact

In case you need to contact the organizers on June 19, you can do this by phone and WhatsApp:

Niels Agatz (+31)6 48 97 68 24

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### Online platform: Zoom

We will use Zoom as our platform for the online workshop. You can download the app using this link: <https://zoom.us/download>, or simply use the links provided in the program. We use a different 'Zoom session' for the four different parts of the day, corresponding to four separate links. Some instructions on using Zoom will be given during the Welcome at 10:15. This includes online meeting etiquettes.

### Presentations

The morning and Early afternoon program consists of plenary presentations and discussions. The presenters are asked to aim for a 10 minutes presentation, leaving 15 minutes for discussion. The goal is to share our research ideas (past, present and/or future), and provide and collect feedback.

### Breakout sessions

In the late afternoon we will have a speed-date like event, which allows for small-scale interaction. We aim for 5 rounds of roughly 10 minutes, with 5 minute gaps in between, for talks with 3 persons per group. Again the goal is to exchange research ideas and potentially further discuss the presentations.

### Game

In the evening a game will be played online. This is a social event with the goal to cement our professional, and personal, relations. More details on the game will be given during the workshop.

### Morning

<https://eur-nl.zoom.us/j/92472125617?pwd=UjBOTUhhSSIt3NU5yZ2lnY2tUjU1UT09> - Meeting ID: 924 7212 5617 - Password: 560489

10:15-10:30 Welcome and final instructions

10:30-10:55 Florentin Hildebrandt, TU Braunschweig

#### *Arrival Time Estimations for Restaurant Meal Delivery*

*Restaurant meal delivery companies recently provide customers with arrival time estimations. Based on the arrival times, customers choose the restaurant for delivery or decide not to order at all. Accurate estimations increase customer experience while inaccurate estimations may lead to dissatisfaction. Estimating arrival times is challenging because of uncertainty in both delivery and meal preparation process. To account for both processes, we present an offline as well as*

an online-offline estimation approach. Our offline method uses supervised learning to map state features directly to expected arrival times. Our online-offline method pairs online simulations with an offline approximation of the underlying assignment and routing policy; again achieved via supervised learning. Our computational study shows that both methods perform comparably to a full online-simulation at a fraction of the computational time.

10:55-11:20 Irecis Azcuy Fuentes, Pontifical Catholic University Chile

### *Strategic design for home delivery on transit and last-mile vehicles: special cases*

The growing popularity of ever-faster home delivery leads to increasing costs, congestion, and pollution in the last mile. One way to improve urban delivery is to use the existing idle capacity in public transit systems to move orders to intermediate transfer locations from where they are delivered to the customers by small vehicles. This study focuses on the design of such a mixed transport system concerning the transfer locations on the public transit line. We present several special cases to get insights into the key trade-off of this problem.

11:20-11:45 Jarmo Haferkamp, Otto von Guericke University Magdeburg

### *Evaluation of Anticipatory Decision-Making in Ride-Sharing Services*

Innovative ride-sharing services require dynamic decisions on the acceptance of stochastic trip requests and vehicle routing for their fulfillment. Decisions on acceptance and routing must be made under uncertainty about future demand. Our aim is to evaluate the impact of anticipatory acceptance and routing decisions on efficiency and service quality of ride-sharing systems. To this end, we analyze different levels of available information on future demand by solving variants of the underlying dial-a-ride problem.

11:45-12:10 Lena Hörsting, Kiel University

### *Decision Support for Collaborative Passenger and Freight Transport*

As demand for deliveries increases, last-mile transport threatens the quality of urban life by causing high congestion rates and environmental pollution. This contribution focuses on concepts for joint passenger and freight transportation. The purpose is to maximize capacity while minimizing cost for both providers and the environment by sharing infrastructure or vehicles. Related problems need to be evaluated in a joint framework, as outcomes affect each other in interplay; rather than treating them in isolation. The objective is to support planning and highlight the potential for integrative modelling in collaborative transport.

## Early afternoon

<https://eur-nl.zoom.us/j/91342285804?pwd=SGpwa2RyN01DRmwwU2YrUla1c29NQOT09> - Meeting ID: 913 4228 5804 - Password: 737891

13:00-13:25 Jonas Schwamberger, University of Mannheim

### *Estimation of a Consider-Then-Choose Customer Choice Model for Tractable Assortment Optimization*

Assortment optimization is notoriously difficult for many choice models. We propose an estimation approach for two-stage choice models that yields a structure that can be exploited in the assortment optimization. We test this approach on the specific case of a random consideration set model with multiple preference rankings.

13:25-13:50 Liana van der Hagen, Erasmus University Rotterdam

### *Dynamic Time Slot Management with Uncertain Basket Sizes*

In e-grocery, customers can typically select a delivery time window to receive their groceries. To provide a reliable delivery service, the retailer wants to only accept customer orders that are feasible given their fulfillment capacity. One complicating factor is that many online grocers allow customers to change their order basket at any time before the cut-off. This means that an order that is feasible at the time of order placement may later become infeasible. We study the challenges that arise with this service proposition and propose strategies to deal with it.

13:50-14:15 Merve Keskin, University of Warwick

### *Dynamic Multi-Period Vehicle Routing with Touting*

This study introduces a dynamic vehicle routing problem with touting as demand management technique, where customers that have not yet placed an order can be actively encouraged to order sooner. Touting the right customers, for example, those located nearby customers who already placed orders, allows for more efficient routes over time. To tackle this problem, we propose several strategies to decide which customers to tout and when, and combine these touting strategies with a rolling-time horizon dynamic vehicle routing algorithm. The different strategies are empirically compared in a simulation based on a real-world waste collection problem. We demonstrate that touting allows to reduce the travel distance significantly.

## Late Afternoon

<https://eur-nl.zoom.us/j/98245116446?pwd=UGN3bGVckZLbEh1TWf1RFZVQmNkUT09> - Meeting ID: 982 4511 6446 - Password: 902005

14:45-16:00 Breakout sessions

16:00-16:15 Group picture and close of the formal program

## Evening

<https://eur-nl.zoom.us/j/99616564608?pwd=bUZ0eIBSeDZPUy9Rd0VDMWU0Q1UrUT09> - Meeting ID: 996 1656 4608 - Password: 695814

20:00-... Game

## List of participants

Ann Campbell	University of Iowa
Arne Strauss	University of Warwick
Artur Ansmann	TU Braunschweig
Bruno Neumann Saavedra	TU Braunschweig
Catherine Cleophas	Kiel University
Dirk Mattfeld	TU Braunschweig
Florentin Hildebrandt	TU Braunschweig
Irecis Azcuy Fuentes	Pontifical Catholic University Chile
Jan Fabian Ehmke	University of Vienna
Jarmo Haferkamp	Otto von Guericke University Magdeburg
Jeannette Hermanns	TU Braunschweig
Jonas Schwamberger	University of Mannheim
Katrin Waßmuth	University of Mannheim
Lena Hörsting	Kiel University
Liana van der Hagen	Erasmus University Rotterdam
Marlin Ulmer	TU Braunschweig
Mathijs van Zon	Erasmus University Rotterdam
Merve Keskin Ozel	University of Warwick
Moritz Fleischmann	University of Mannheim
Niels Agatz	Erasmus University Rotterdam
Ninja Soeffker	TU Braunschweig
Remy Spliet	Erasmus University Rotterdam
René de Koster	Erasmus University Rotterdam
Rico Kötschau	Otto von Guericke University Magdeburg
Steffen Elting	University of Vienna
Thomas Visser	ORTEC B.V.
Vanessa Völz	TU Braunschweig
Yannick Scherr	TU Braunschweig