

A cordial invitation to the opening talk of the
Brown Bag Seminar
Recent Developments in Data Science:

A MIP-based solution approach for synchronizing services in city logistics

By
Dr. Julia Lange

Date: 18.01.2024 (Thursday) at 12:00

Location: SR 027 WIWI

Link and further
information: Course 39740 Seminar: Doctoral Seminar "Recent
Developments in Data Science" in Stud.IP

Abstract:

Future city logistics systems focus on multi-tier transportation with heterogeneous vehicles, an integration of freight movements into rail-based mobility and minimal spatial requirements. Resource sharing among multi-directional commodity flows as well as innovative transportation-as-a-service ideas are of significant importance. The presented planning approach is based on two-tier service network design. Transportation services with routes, departure time windows and capacities are given, and waiting time policies at customer and handover locations need to be respected. The goal is to select and schedule a set of services and assign the demands to them so that both operating costs and waiting times are minimized. To avoid additional storage facilities for handovers, exact on-time synchronization of services is considered and constitutes a major challenge. Preliminary computational results show that determining waiting times and respecting satellite capacity restrictions have a significant effect on complicatedness and solvability when using a general mixed-integer-programming (MIP) solver. In this talk, a hierarchical MIP-based solution approach is proposed and different variants of problem-specific variable fixing are discussed. The computational study supports the usage of these techniques and points out promising future research directions.

(joint work with Teodor Crainic, Timo Gschwind and Walter Rei)

Speaker:

Dr. Julia Lange

Julia Lange is a postdoctoral researcher at the Chair of Logistics of the University of Kaiserslautern-Landau. She holds a PhD in Mathematics from the Otto-von-Guericke-University of Magdeburg. Her research focuses on applying mathematical optimization methods to planning problems in city logistics and manufacturing with temporal aspects. After working on industry-related projects in production and logistics at the FZI Research Center for Information Technology in Karlsruhe, she was a postdoctoral fellow at the Université du Québec à Montréal and CIRRELT. In 2021, Julia has been selected among the Young Women 4 OR by the EURO WISDOM Forum.