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## Séminaire conjoint CRI<sup>2</sup>GS et CIRRELT

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### A CONSTRUCTION MATHEURISTIC FOR TWO-TIER SYNCHRONIZED CITY LOGISTICS

**Abstract:** Sustainable city logistics planning focuses on multi-tier and multi-modal transportation with efficient consolidation and vehicle types suited for each tier. This work considers a day-before planning problem in two-tier multi-modal city logistics with on-time synchronization, where no storage exists at handover locations. While this enables the use of existing resources in the distribution process, the requirement of vehicles to meet is a challenge. The planning approach is based on scheduled service network design, where transportation services with routes, departure time windows, and capacities are given, and waiting time policies exist for customer and handover locations. The goal is to select services, including a schedule for each of them, and allocate the demands such that both operating costs and waiting times are minimized. We present a two-step construction matheuristic, where the search space is reduced by fixing a subset of binary selection variables based on solutions of a relaxed model. The simple method validates the accurate mathematical description of structural and temporal requirements and demonstrates the applicability of the model to obtain near-optimal solutions. We provide interesting methodological and managerial insights from varying instance parameters and discussing dependencies within the solution's structure.

**Bio:** Julia Lange is a postdoctoral fellow at the University of Kaiserslautern-Landau, Germany. She holds a PhD in Mathematics from the University of Magdeburg. After working on industry-related production and logistics projects at the FZI in Karlsruhe, she joined the Chair of Logistics in Kaiserslautern. Her main research interests are planning problems in city logistics and intralogistics with a special focus on temporal aspects. In 2022/23, she was a postdoc at UQAM / CIRRELT. Julia has been selected as one of the Young Women 4 OR by the EURO WISDOM Forum.

MERCREDI / WEDNESDAY

31 juillet 2024, 10 h 30

July 31<sup>st</sup> 2024, 10:30

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Teodor Gabriel Crainic

