



Master Thesis

A heuristic algorithm for scheduling driving time and working time breaks in vehicle tours

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Our chair

Our chair is devoted to the development and implementation of decision support systems for solving and analyzing planning problems in logistics and production, especially transportation, network design, location planning, warehouse management and workforce scheduling problems. The methodological focus lies on mathematical modeling, exact and heuristics optimization, and machine learning techniques. Our intensive collaboration with Deutsche Post DHL and other industry partners provides a strong application focus for many of our projects.

Description

Based on an ongoing industry project in collaboration with Deutsche Post DHL, your task is to develop and implement a heuristic algorithm for scheduling driving time and working time breaks (which are prescribed by law) in existing vehicle tours. We define a vehicle tour as a sequence of single trips. Each of these trips is characterized by (i) a vehicle type, (ii) a facility where the trip starts, (iii) a facility where the trip ends, and (iv) the starting time at which the vehicle departs for the trip. Required driving time and working time breaks can be scheduled before departing a facility, after arriving at a facility, or during a trip.

Tasks:

- Describe and categorize algorithms from literature on similar optimization problems that consider driving time and working time breaks.
- Develop and implement a heuristic algorithm to schedule driving time and working time breaks in vehicle tours.
- Evaluate the implemented heuristic algorithm on test instances that are inspired by the application context of Deutsche Post DHL.

Requirements

- Motivation to work independently
- Good knowledge of German and English
- Good programming knowledge in C++, Java, or Python, or the willingness to acquire the necessary knowledge on your own

What we offer

- Immediate start of your master thesis, or by appointment
- Insights into an exciting industry project
- Close supervision
- Possibility to work from home

If you are interested, please send an e-mail including your CV and transcript of records to Julian Rothermel (rothermel@dpo.rwth-aachen.de).