Master Thesis

Machine learning to estimate the tour costs of the Single Picker Routing Problem with Multiple End Depots

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.

Your task
The Single Picker Routing Problem (SPRP) aims to find a minimum-cost tour visiting all picking positions of a picking order. The SPRP with Multiple End Depots is a variant of the SPRP, in which the picker does not have to return to the same depot from which she started the tour. In this master thesis, multiple machine learning techniques shall be used to estimate the tour cost of the SPRP with Multiple End Depots. To generate training data, an existing MIP formulation of the problem shall be used. The goal of the thesis is to compare different machine learning techniques for regression, such as variants of linear regression, regression trees, or artificial neural networks with regard to the tradeoff between solution quality and runtime.

Your profile
• Reliable, independent, and motivated way of working
• Conscientious and structured approach to work
• Good knowledge of English
• Very good programming skills or the willingness to acquire the necessary knowledge on your own

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