Decision support for rolling stock management – A contribution to the 2014 EURO/ROADEF Challenge

Martin Josef Geiger\textsuperscript{*1}, Sandra Huber\textsuperscript{1}, Sebastian Langton\textsuperscript{1}, Marius Leschik\textsuperscript{1}, Christian Lindorf\textsuperscript{1}, and Ulrich Tüshaus\textsuperscript{1}

\textsuperscript{1}Helmut-Schmidt-University, University of the Federal Armed Forces Hamburg – Allemagne

Résumé

The 2014 EURO/ROADEF Challenge describes an interesting optimization problem arising in the operative management of rolling stock. It consists in the operative management of trains/ convoys in a station, and includes the assignment of arriving trains to departures, as well as the planning of parking, maintenance, and shunting activities. From an optimization point of view, the problem combines aspects of routing and scheduling, as trains have to move from one resource to another, while a rather large set of side constraints has to be respected.

We contribute to this problem with a recently developed and implemented decision support system. The system comprises a visual interface for the presentation of the rolling stock movements in the station. The underlying optimization problem is addressed by a set of heuristics, each of which tries to optimize a sub-aspect of the problem. To mention are: Platform assignment, train-departure-assignment, routing, and subsequent scheduling.

We have tested our system on the datasets of the EURO/ROADEF 2014 Challenge. Our first results and the insights gained are presented in the talk.

\textbf{Mots-Clés:} EUR/ROADEF 2014 Challenge, rolling stock optimization