

„Analysis of the relationship between delays and railway network topology“

The aim of this thesis is to investigate possible correlations between the topology of a rail network and the occurrence and propagation of delays.

Firstly, a literature review of mathematical models of the formation and propagation of delays in rail networks is to be carried out. Based on publicly available real-world delay and network data, a railway network will then be modelled at a macroscopic level of aggregation. For this network, the relationships between network topology, the timetable and delay patterns will be analysed. This involves, on the one hand, a statistical analysis and processing of the delay data, including, for example, an analysis of temporal patterns and the aggregation of data at the node or edge level. On the other hand, suitable metrics and indicators for the network model and the timetable will be selected and calculated. The aim is to identify structural characteristics that may be correlated with an increased susceptibility to delays. Finally, measures relating to the network topology and the operating programme must be identified that could lead to a reduction in delays.