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Titel des Beitrags:
Energy Optimisation for Subway Trains by Interactive Track Alignment Planning

Abstract:
The basis for planning a subway tunnel is the so-called alignment model describing the specific course of the track. The alignment itself is one of the fundamental sources for a train's overall energy consumption in the operational phase, which in general lasts for many decades. Thus, even small changes to the alignment can have a major impact on the overall energy consumption. Currently, the alignment's influence on the energy consumption is not, or only rudimentarily, considered in the planning of new subway tunnels. Our approach, presented in this paper, aims to overcome this deficiency based on an autonomous energy simulation to support the engineer while planning the alignment. This simulation calculates the changes in the energy consumption with every modification made by the planning engineer, in the background and in real time. Thus, this model allows a priori prediction of the energy consumption during the planning phase, in contrast to other existing approaches that only allow a posteriori calculations during the operational phase. Additionally, we will present ideas for energy optimisation, in particular, an automatic energy optimisation approach based on an ant colonisation algorithm.

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