TU Clausthal

Kolloquium zur Masterarbeit

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"Time Series Forecasting Algorithms for Vehicle Platooning Problem"

Time series forecasting algorithms have gained special attention in diverse scientific fields to make anticipations about the future behaviour of various road traffic parameters which may contribute significantly to many decision-making fields. In the literature, only a few studies addressed applying machine learning methods to tackle dynamics in platooning. This work focuses on utilizing time series forecasts to solve dynamic platooning problem, where platooning situation like splitting, joining and size of the platoon may change while driving within a platoon. To this end, two time series forecasting algorithms: LSTM and Exponential Smoothing, were trained on hourly traffic volume time series to produce predictions of traffic volumes on different road sections. The resulted predictions are then used to find out the best route with platooning for each source and destination in the road network based on the fuel economy criterion. The created time series forecasting models provided predictions at an average accuracy of around 82% across all roadways. Moreover, up to 93% of the predicted best routes with platooning had perfect match with the corresponding true best routes. Our findings indicate that time series forecasts can be considered as a reliable means to obtain accurate predictions of traffic volume on the roads which may help making better decisions for dynamic platooning problem.

Freitag, 18.03.2022, 14.00 Uhr

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