



Eröffnungsvortrag Research Track

Donnerstag, den 16.12.2021, 16:00 Uhr,
<https://webconf.tu-clausthal.de/b/jor-etu-tck>

Forschungsprojekt:

Merlin Korth

“Influence of Grid Cell Sizes on Taxi Demand Prediction”

Accurate taxi demand prediction can support cities to reduce air pollution by predicting the number of taxis needed at a certain place and time. Several demand prediction models of different types have been proposed in the literature. Approaches that aggregate the demand into grid cells or grid-based approaches are most common. We observed that these models use different grid topologies and sizes. Yet, from our perspective, it is not clear how and why the grid cells are configured the way they are. In addition, some papers state that smaller grid cell sizes might improve the prediction accuracy. However, a comparison of different topologies and sizes as regards their influence on urban demand prediction is missing.

In this research project, we will focus on the comparison of different grid cell sizes - 125, 250, 500, and 1000 meters - and their impact on the prediction accuracy of different types of taxi demand prediction models, like Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Long Short-Term Memory Networks (LSTM), and Graph Neural Networks (GNN). In particular, we use three existing taxi demand prediction models - MLRNN, pmlLSTM, and STDGAT - and two baseline models - CNN, and XGBoost. The performance of the prediction models will be evaluated using the metrics Mean Average Error, Mean Relative Error, and Root Mean Square Error.

The main contribution of the proposed research project will be a comparison of different grid cell sizes to evaluate the influence of the size on the accuracy in taxi demand prediction models.

Gutachter: Prof. Dr. Jörg P. Müller und Prof. Dr. Rüdiger Ehlers (ISSE)