Vacancy internship project
Short Term Prediction – self learning calibration

INTRODUCTION

In traffic management the main challenge is to make the step from adaptive traffic management with no cooperation between public (i.e., road authorities) and private parties providing mobility services (e.g., MaaS, information services, route guidance, etc.) towards anticipated traffic management and with cooperation on network level. To achieve this, it is essential that future traffic states can be predicted for all circumstances, i.e., highways, urban and provincial networks, and for regular and non-regular conditions. Existing research has been mainly on data driven machine learning algorithms (non-parametric models like (deep) neural networks and Bayesian networks) like long short-term memory neural networks. Although such methods only use a small number of parameters, focus on the huge increase of data availability and better performance in scalability, they have some serious deficiencies which reduces the applicability of such methods in practice (e.g., flexibility, coping with incidents, fusion of various data sources and coping with missing data, interpretation, or impact assessment of measures). Hybrid approaches combining data driven and model-based approaches can be used to overcome these deficiencies. Goudappel develops such short-term prediction models and wants to further improve and extend these models.

PROBLEM DESCRIPTION

Model based approaches in which real-time data is fused with a real-time simulation model are valuable and in general capable to provide short term predictions in which non-regular traffic conditions can be taken into account. However, the system needs a lot of parameters to be initialized and tuned which is a labor-intensive job and possibly should be reconsidered after a period of time.

RESULT / OBJECTIVE

The development of a methodology to automatically calibrate the parameters based on the performance of the predictions in real time settings, including a suitable way to recalibrate these parameters.

ASSIGNMENT

Develop a suitable model to be incorporated within the short-term prediction mode which learns, based on past performances, the optimal setting of parameters. For this purpose, the living lab of Deventer can be used providing an operational system and historical data.

INFORMATION

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More information on Goudappel and DAT.Mobility can be found via www.goudappel.nl and www.dat.nl