



Master Thesis (m/w/d) Validation of Traffic Simulation Library for Autonomous Driving

We introduced the first truck 125 years ago and continued to pioneer Advanced Driver Assistance Systems technology in commercial vehicles. In June 2019, Daimler Trucks established an international division to bring autonomous driving technologies to series production. Together with our partners Daimler Trucks North America and Torc Robotics we focus on bringing highly automated trucks onto the roads.

We seek a highly motivated and technically adept Master's student (m/f/d) to contribute to the advancement of our simulation and validation toolchain for autonomous driving as part of a Master's thesis project. A pivotal aspect of this toolchain involves the systematic identification of critical scenarios in traffic and ensuring comprehensive coverage of the Operational Design Domain (ODD). Our aim is to construct a coverage model capable of assessing the adequacy of simulations in encompassing all pertinent traffic scenarios, without reproducing the probabilities of occurrence.

To accomplish this objective, we use an expanding dataset of test drives from Torc Robotics to develop a coverage model using machine learning methodologies. Our objective is to enhance this approach by integrating metrics of criticality to prioritize critical scenarios. The Master's thesis will concentrate on the identification and implementation of these criticality metrics. Subsequently, the findings will be integrated into the coverage model creation process, incentivizing the inclusion of critical scenarios. The resultant algorithm is expected to streamline the generation of coverage models, facilitating their applicability across various traffic scenarios with minimal oversight.

What you will do

- Research on safety and criticality measures for road traffic
- Cleaning and preparing high-dimensional datasets on kinematics in road traffic
- Implementation of criticality measures in a cloud-based development environment
- Try out different paths in computational optimization
- Optimizing coverage model creation algorithm against quality measures

Benefits

- Opportunity to work on a cutting-edge research project in the field of autonomous vehicles
- Gain hands-on experience with simulation tools and programming languages
- Collaborate with a team of experts in the field
- Flexible working hours and the ability to work remotely

Qualifications

- Pursuing a degree in Computer Science, Electrical Engineering, or a related field
- Strong programming skills, ideally in Python
- Strong attention to detail and problem-solving skills
- Ability to work effectively in a team environment
- Familiarity with autonomous vehicle technology and testing methodologies, including simulation and modeling, is a plus

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