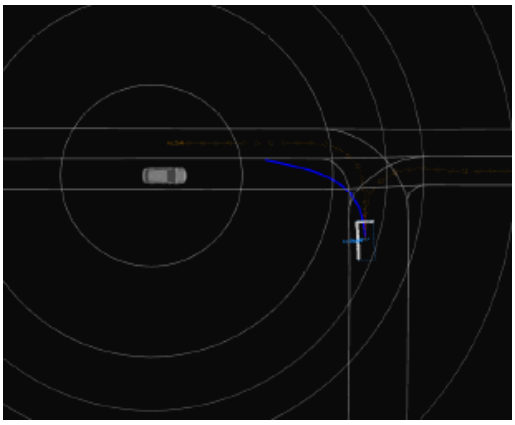
Lehrstuhl für Fahrzeugtechnik
Fakultät für Maschinenwesen
Technische Universität München

IDP

# Exploring Vehicle Trajectory Prediction Approaches for Real-World Autonomous Driving

At the Institute of Automotive Technology, we aim to develop a holistic software for autonomous driving that will ultimately be used in vehicles. As part of the "EDGAR" project, we are currently developing a vehicle that will be used as an autonomous shuttle for the upcoming Wiesn in 2024 (Level 3+). To ensure the safety of all parties involved in road traffic, the vehicle must be able to reliably detect dynamic objects and, in particular, robustly predict their intentions based on various features. In this context, predicting vehicles reliably is an essential task to consider their future behavior and avoid collisions. The challenges regarding the applicability of such algorithms on the vehicle are given by both the accuracy and scalability for an increasing number of traffic participants.

This thesis explores state-of-the-art vehicle trajectory prediction methods with the goal of testing the most promising ones on our research vehicle. To accomplish that, an initial literature research is conducted to identify suitable approaches based on metrics relevant for a practical application. After selecting the top two options, the subsequent task involves integrating them into the software stack and evaluating their performance against our existing approaches in AWSIM. Finally, after the algorithms were successfully tested in a simulation environment, real-world tests are conducted through a test drive of our EDGAR vehicle.

**Work packages**

- Literature research about vehicle trajectory prediction methods
- Selection of two suitable methods based on the defined metrics
- Integration of the two approaches into our existing microservice architecture
- Qualitative and quantitative comparison with our existing methods in AWSIM
- Evaluation of the final software on our EDGAR vehicle

**Requirements**

- intrinsically motivated to contribute to the field of autonomous driving
- self-starter and eager to explore new concepts
- experience with ROS2 and Python
- familiar with Docker and Git

**Contact**

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