

Evaluation of trajectory prediction algorithms on an autonomous vehicle



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 already 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, trajectory prediction is essential to determine the future behavior of road users. The challenges regarding the applicability of such algorithms on the real vehicle are given by both the runtime and the accuracy.

The focus of this work is therefore the evaluation of existing approaches for trajectory prediction on our test vehicle "EDGAR". In a first step, the existing implementation in Autoware is inspected and the interfaces are analyzed. Afterwards, our custom prediction algorithm is integrated based on the previously identified interfaces. The evaluation takes place in the so-called "Planning Simulation" of Autoware, where the performance of both algorithms will be compared qualitatively and quantitatively. Finally, first tests will be performed on the test vehicle itself.

This work comprises the following work packages:

- Pre-analysis of the existing vehicle prediction in Autoware including ROS2 interface definition
- Integration of the existing Python-based implementation
- quantitative and qualitative comparison of both methods regarding accuracy and runtime in the "Planning Simulation" of Autoware
- final evaluation of the prediction on our research vehicle "EDGAR"
- documentation of the code and the results

Requirements

- intrinsically motivated and interested in the topic of autonomous driving
- programming experience with Python (bigger projects, working in groups, etc.)
- first programming experience with C++ and ROS2
- experience with Git

Contact

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