

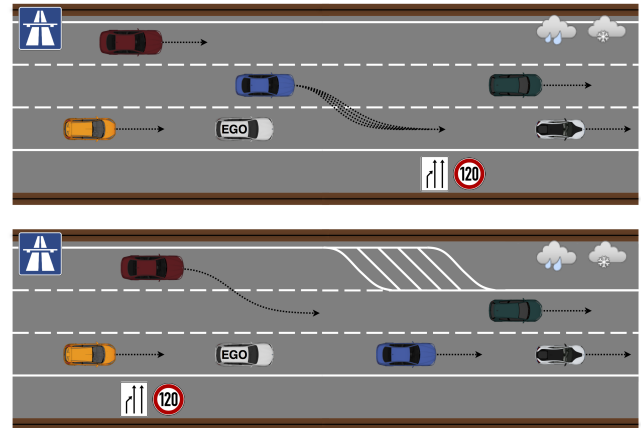
MASTER'S THESIS

Systematic Variation of Driving Scenarios for the Assessment of Automated Driving

The assessment of autonomous driving functions involves a more comprehensive scope to test than up to date released advanced driver assistance systems [1]. To cover the required test volume, exclusive field operational tests or naturalistic driving studies are not sufficient. Therefore, also additional test domains like simulation or vehicle in the loop have also to be enabled to assess the autonomous driving function.

A common basis to define test cases in automotive applications are scenarios [2]. Parameters like weather condition, road topology and dynamic movement variables defines representation of a scenario as point in the so called test space. Simulation of variated scenarios are intended to reach dense coverage and generate virtual testing kilometers. However, this variation is not trivial due to properties, correlations and boundaries of parameters [3].

The goal of this thesis is to establish a systematic scenario variation algorithm generating meaningful, realistic and test space covering scenarios. This includes the verification of generated scenarios within an existing simulation and assessment framework.



Requirements

- Good programming skills in Python
- Basic knowledge of vehicle models, driving simulation and design of experiments (DOE)
- Basic knowledge in code versioning with GIT
- Ideally first experiences with docker

References

- [1] H. Winner et. al., "Validation of Automated Driving - Strategies and Challenges," May 2016.
- [2] S. Ulbrich et. al., "Defining and substantiating the terms scene, situation, and scenario for automated driving," in *Intelligent Transportation Systems (ITSC), 2015 IEEE 18th International Conference on*, pp. 982–988, IEEE, 2015.
- [3] F. Schuldt et. al., "Effiziente systematische Testgenerierung fuer Fahrerassistenzsysteme in virtuellen Umgebungen," *Automatisierungssysteme, Assistenzsysteme und Eingebettete Systeme Fuer Transportmittel*, 2013.

Application

Please send your application documents (resume and transcript of records) to Sebastian Wagner (sebastian.wagner@tum.de).