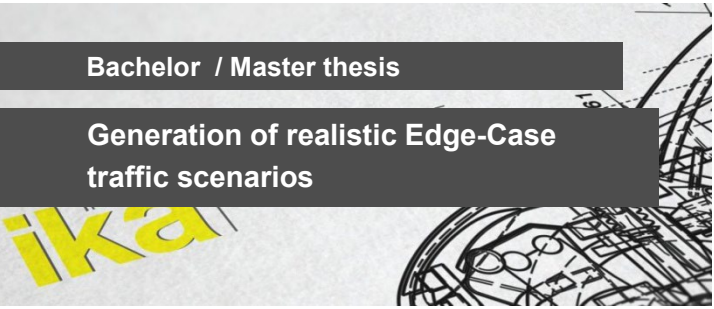
Student thesis



Bachelor / Master thesis

Generation of realistic Edge-Case traffic scenarios

Topic and Goal of the Thesis

After an accident involving an automated vehicle, the developer of the system faces a judge. How can it explain to him that the system was correctly safeguarded despite the accident?
This is a central question in research on safeguarding automated vehicles. A central approach for this is scenario-based testing. Particularly exciting are edge cases that challenge the system but are still intended to be realistic. However, such edge cases rarely occur in reality and can hardly be found in data.

In this thesis, a method for generating realistic edge cases of driving scenarios based on real data shall be developed. In particular, it shall be analyzed how the behaviour of dynamic road users can be without creating driving scenarios that never occur in traffic. Both, rule-based approaches and machine learning approaches can be used for this purpose.

Working Points

- Literature research on the topics of scenario generation from real world data and edge cases in the context of driving scenarios
- Development of a methodology to generate realistic Edge-Cases for dynamic road users
- Testing of generated scenarios in simulation
- Validation of the methodology based on real intersection data

Requirements

- Good English or German language skills
- Reliability, commitment and enjoyment of working independently as well as methodically
- Basic knowledge in vehicle dynamics
- Experience with python

Department

Vehicle intelligence and automated driving

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Language

German or English

Entry Date

Earliest possible date

Prior knowledge

Python