

Master Thesis

Aushang ab: 11.09.2023
Aushang bis:
Status: offen
Forschungsgruppe: CAE / Optimierung

Kontakt

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Simulating Real-World Challenges: A Virtual Dynamic Environment for Autonomous Vehicle Validation

As the popularity of autonomous driving increases, the emphasis on their safety is growing. To address complex challenges related to validating autonomous vehicles, we will explore innovative approaches like usage or application of the concepts of Metaverse and gamification. In this thesis, you will investigate how integrating game mechanics, rewards, and interactive challenges can create a dynamic validation framework that engages human operators and AI systems. Design and evaluate a gamification-based approach within meticulously crafted virtual environments to simulate complex real-world driving scenarios.

This thesis offer you an opportunity to study cutting-edge topics in autonomous vehicles, artificial intelligence methods, simulation, game engines, and more.



Figure 1. Virtual vehicle validation (Source: Unreal Engine 5)

Tasks:

- A comprehensive literature review on virtual validation environments for autonomous vehicles
- Get familiar with the Metaverse, game engines like Unreal Engine, and simulators such as CARLA, BeamNG.tech, CarMaker, and others
- Choosing a suitable and practical validation process
- Implementation of the validation process within the virtual environment

Your Profile:

- Studies in Engineering
- Very good programming skills (Ideally in C++)
- Interest in autonomous vehicles, virtual environments, and validation
- Motivated to work in a team, are independent, and take initiative
- Excellent written and spoken English
- Passion to learn and apply new programming languages and technology concepts
- Ideally, experience with Robotic Operation System (ROS)

If you are interested, please send a detailed application with a current grade transcript to:
majid.jegarian@kit.edu