Interdisciplinary Project

Extension of an Open-source Autonomous Driving Simulation for German Autobahn Scenarios

This work can be done in German or English in a team of 2-4 members.

Self-driving cars need to be safe in the interaction with other road users such as motorists, cyclists, and pedestrians. But how can car manufacturers ensure that their self-driving cars are safe with us humans? The only realistic and economic way to test this is to use simulation.

cogniBIT is a Munich-based Startup founded by Alumni of TUM and LMU and provides realistic models of all kind of road users. These models are based on state-of-the art neurocognitive and sensorimotor research and reproduce human perception, cognition, and action with all its limitations.

In this project the objective is to extend the open-source simulator CARLA (www.carla.org) such that German Autobahn-like scenarios can be simulated.

Tasks:

- Design an Autobahn scenario using the road description format OpenDRIVE.
- Adapt the CARLA OpenDRIVE standalone mode (requires C++ knowledge).
- Design an environment for the scenario using the Unreal Engine 4 Editor.
- Perform a simulation-based experiment using the German Autobahn scenario and the cogniBIT driver model.

Prerequisites:

- C++ knowledge
- experience with Python is helpful
- experience with the UE4 editor is helpful
- interest in autonomous driving and cognitive models
Figure 1: Traffic simulation in CARLA

If you are interested, contact us at idp@cognibit.de!