Driving Simulator 2022 - Reloaded

Serious Gaming for Autonomous Driving

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Cognitive Neuroinformatics

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http://www.cognitive-neuroinformatics.com
Research Systems

→ Smart Hives
→ Robohead
→ Wheel-driven robots
→ ADAS model cars
→ EnEx-IceMole
→ AO-Car/OPA3L Passat GTE
BMWi/DLR Project OPA3L

Kartendaten: Google, GeoBasis-DE/BKG ©2009
Previous Projects

→ Highly-automated driving
→ Control of model vehicles
→ Simulation environment

→ 3 projects:
→ Build-up of test environment
→ Development of simulation environment
→ Cooperative maneuvers
Driving Simulator 2022

- Master project winter semester 2021/22
- Modeling of Borgfeld
- Street network, buildings, vegetation
- Scripting of traffic participants
- Other vehicles, public transport, pedestrians
- Interaction with simulation
- Manual control of traffic participants (steering wheel)
- Interface to autonomous algorithms
- Data overview
Simulation for Autonomous Driving

→ Open-source simulator: CARLA
→ Based on Unreal Engine
→ Vehicles, sensors, actuators, AI

→ Map editor: RoadRunner
→ Road network
→ Environment: traffic signs, buildings, vegetation, etc.
Hardware and Software

- Racing wheel and pedals
  - Logitech Driving Force
- VR Headsets
  - Oculus Rift
  - HTC Vive
- Simulation environment
  - CARLA (Unreal Engine)
- Road network modeling
  - RoadRunner, OpenDrive
- 3D Modelling
  - Program of choice
Possible Project Goals

→ Continuation of Driving Simulator 2022
→ Advanced Human Machine Interface (HMI)
→ Driving in VR, walking, bicycling
→ Interaction with AI vehicles
→ Modelling of special events
→ Construction sites, emergency vehicles, accidents, etc.
→ Extension of test environment
→ E.g. Uni-Campus
→ Cooperative AI
Our Expectations

→ Self-organization
→ Definition of overall goals and subgoals
→ Resource management
→ Organization of meetings and presentations

→ Interest in one or more of the following
→ 3D modelling
→ Scripting (e.g. Python)
→ HMI
→ AI algorithms
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