Universität Bremen

Cognitive Neuroinformatics

Faculty 03
Mathematics/Computer Science

Driving Simulator 2022

Serious Gaming for Autonomous Driving

Kerstin Schill, Christoph Zetzsche,
Joachim Clemens, Verena Schwarting
Bremen 06.05.2021

cognitive neuroinformatics

Cognitive Neuroinformatics

→ Head of institute

→ Prof. Dr. Kerstin Schill

→ Project supervisors

→ Dr. Christoph Zetzsche

→ Dr. Joachim Clemens

→ Verena Schwarting

http://www.cognitive-neuroinformatics.com


Kerstin Schill


Christoph Zetzsche


Joachim Clemens


Verena Schwarting

Research Systems

→Smart Hives

→Robohead

→Wheel-driven robots

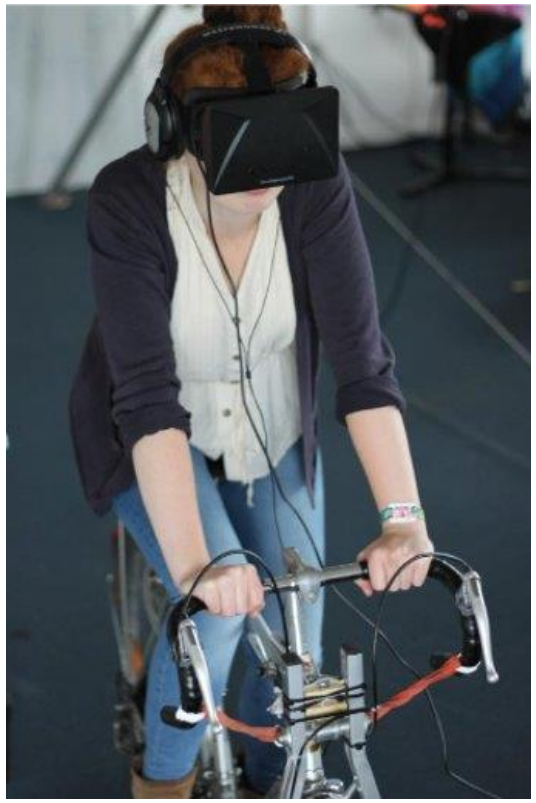
→ADAS model cars

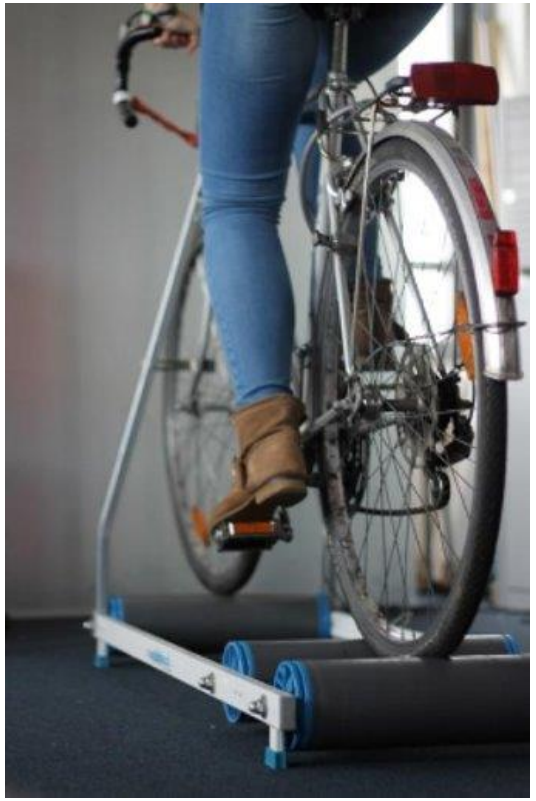
→EnEx-IceMole

→AO-Car Passat GTE

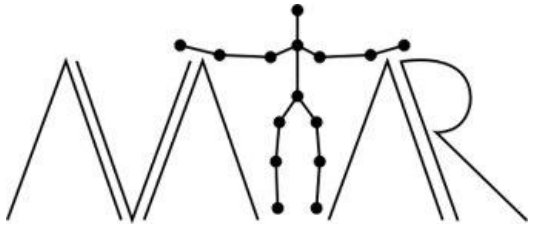
Previous Projects

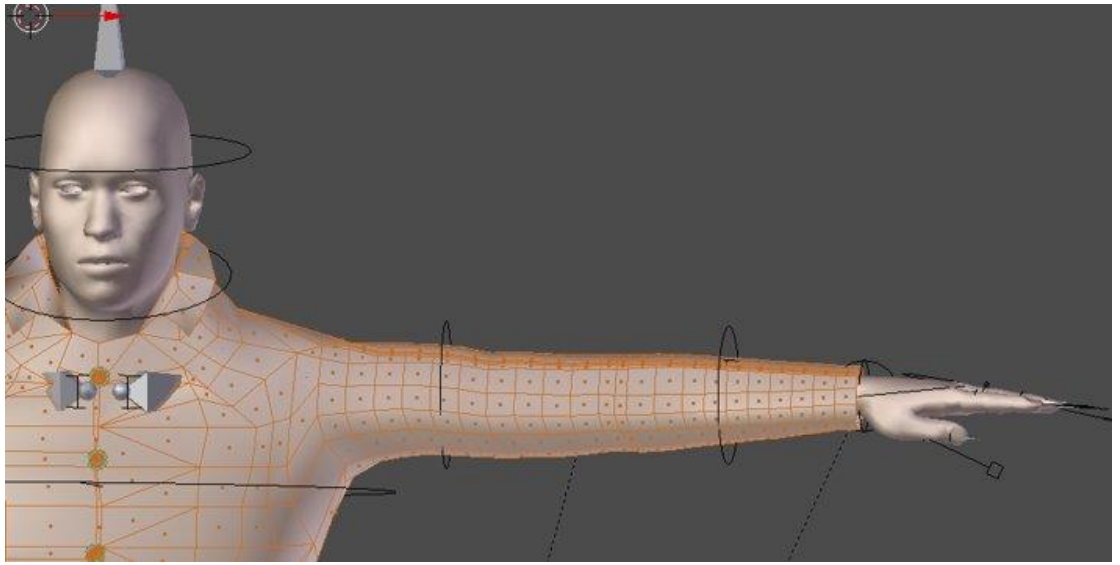
Bicycle Simulator

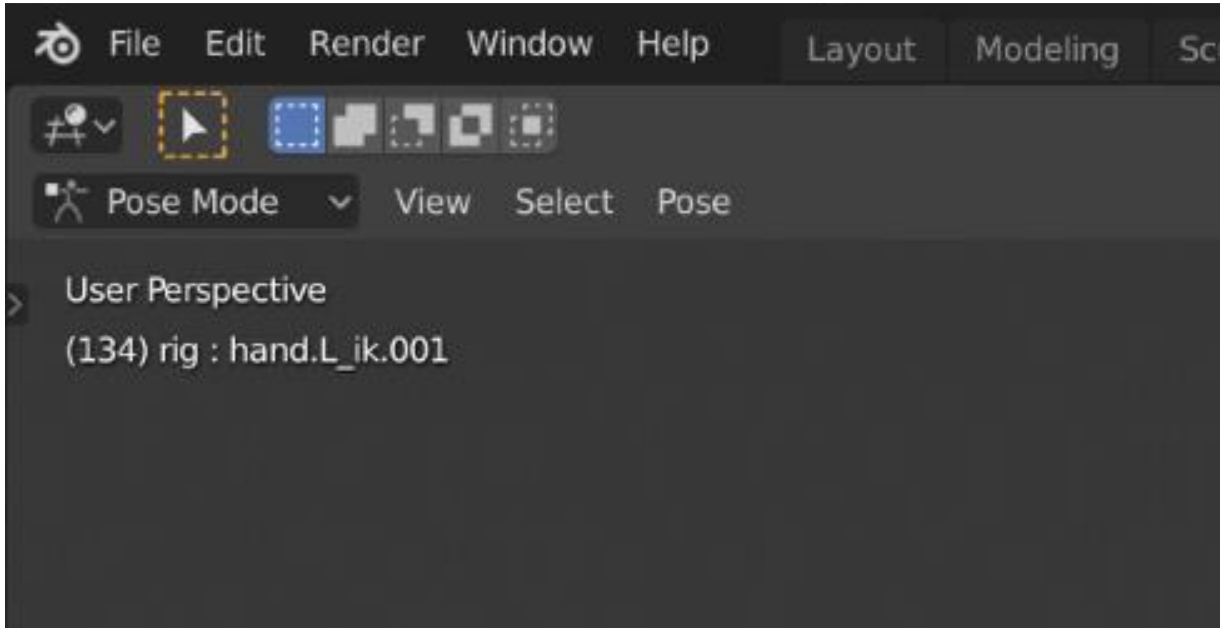




Previous Projects







Previous Projects

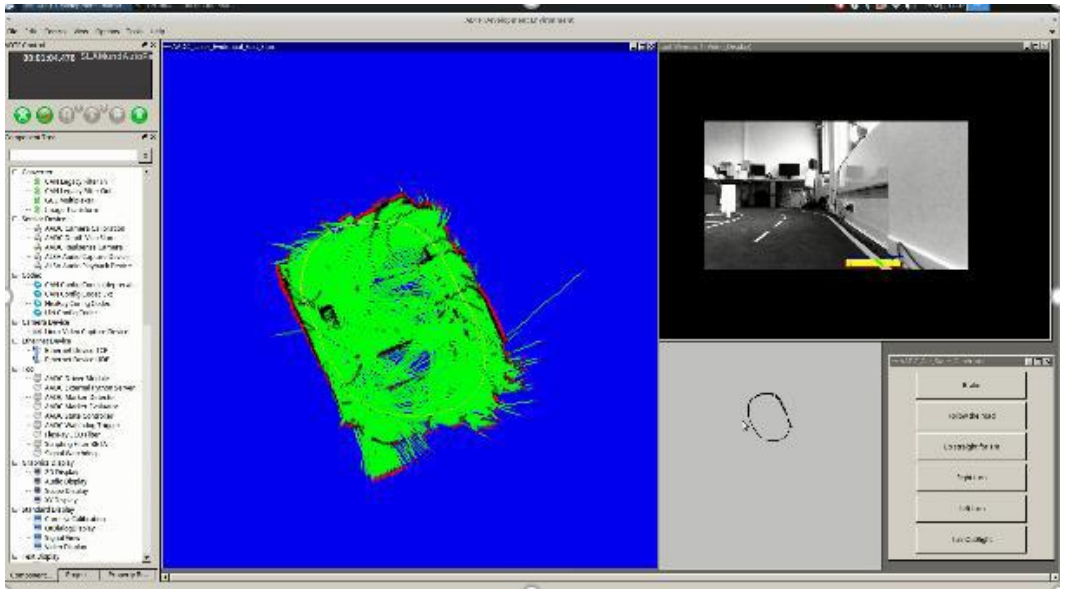
→ Highly-automated driving

→ Control of model vehicles

→ Simulation environment

→ 3 projects:

- → Build-up of test environment
- → Development of simulation environment
- → Cooperative maneuvers



Driving Simulator 2021

→Summer semester 2021

→Basic modeling of Borgfeld

→ Street network, buildings, vegetation

→Scripting of traffic participants

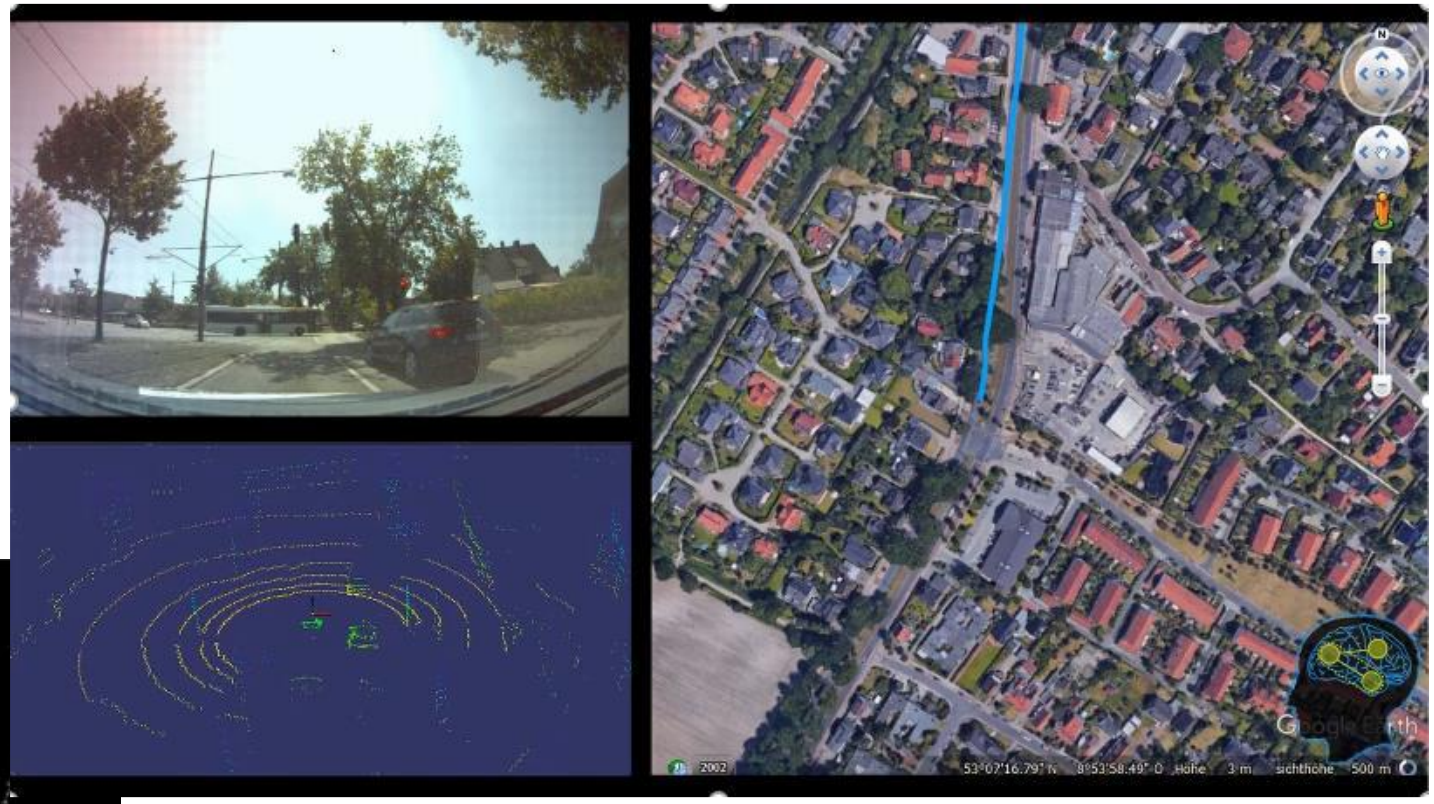
→ Other vehicles, pedestrians, maybe bicycles

→Interaction with simulation

→ Manual control of traffic participants

→ Interface to autonomous algorithms

BMWi/DLR Project OPA3L



Kartendaten: Google, GeoBasis-DE/BKG ©2009

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.

CARLA, Creative Commons Attribute

Project Goals

→Continuation of Driving Simulator 2021

→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

Google, GeoBasis-DE/BKG ©2009

GeoBasis-DE / GeoInformationBremen ©2020

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

CARLA, Creative Commons Attribute

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

→ Basic scripting (e.g. Python)

→ HMI

→ AI algorithms

→Preparation course: Advanced Problems of Multi-Sensory Cognition

Contact

Joachim Clemens
clemens@uni-bremen.de
Cartesium, Raum 4.47
0421 / 218 64183

Verena Schwarting
ve_sc2@uni-bremen.de
Cartesium, Raum 4.49
0421 / 218 64183