

## Advertisement



Bachelor / Master thesis

# Collective Learning of Environment Perception in Fleets of Automated Vehicles

## Overview

One challenge when developing environment perception algorithms for automated vehicles is the availability of high-quality training data for deep learning-based approaches. In Cooperative Intelligent Transport Systems, traffic participants may transmit perception data to cloud-based servers where the data can be intelligently combined to automatically generate training data for neural networks. The training data can then be used to create improved deep learning models for environment perception. These improved models can then be deployed to the fleet of automated vehicles.

In this thesis, such a system is to be improved, made more robust to real-world data and extended with new functions.

You will program in C++ and Python, you will use Tensorflow and ROS, you will get to know MongoDB and MQTT.

Since there are many open research questions in this field of research, there will be a lot of possibilities to shape the topic according to your strengths.

You will have access to the extensive infrastructure of ika including research vehicles, GPU cluster, state of the art sensors and high-fidelity simulation environments. You will be part of a team of other highly motivated researchers in a big research project.

## Working Points

1. Literature research on collective learning and deep learning.
2. Analysis of the existing collective learning system.
3. Development of a concept for improving and extending the current system.
4. Implementation of the developed concept.
5. Training of neural networks with the improved and extended system.
6. Evaluation of the implemented concept.

## Department

Automated Driving

## Contact



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## Language

German or English

## Entry Date

Earliest possible date

## Requirements

- Good English or German language skills
- Reliability, commitment and enjoyment of working independently
- Experience with ROS
- Experience with Python and C++ is an advantage
- Experience with Version Control (Git) is an advantage
- Enthusiasm for using artificial intelligence to solve complex tasks
- Please attach to your application a short CV as well as an academic transcript (grades).