

# Deep Learned Condition Monitoring of an Autonomous Vehicle

## Master's Thesis

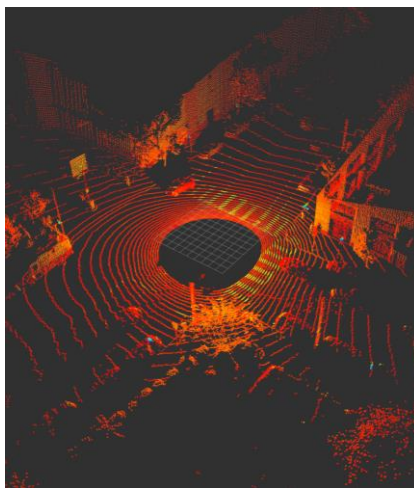
Autonomous Driving

Deep Learning

Condition Monitoring

Safety

Autonomous Driving in public traffic is more present then ever. Autonomous public transport shuttles or even self-driving consumer cars are nothing new. The software of an autonomous vehicle consists of many individual components, that are loosely coupled, each of which can fail. To ensure the vehicle's safety deep Learning Techniques might be utilized to detect failures and malfunctions. Resulting in a monitoring system of the individual components, as well as the overall system, to ensure the vehicle's safety.



### The Topic

- By taking part in test drives with our shuttle buses in real traffic, you get an idea of the vehicle's capabilities
- You will then decide on the component of the software, that your method will monitor and specify the sensor data needed for the failure detection
- With the help of an extensive literature research, you will develop a (deep) learning-based method for recognizing failures and malfunctions with the appropriate data
- You plan and perform the recording of the necessary sensor data in different (real-world) situations
- You will define a concept for artificial failure injection and perform this on your recorded sensor data
- You will evaluate your method based on the recordings

### Your Skills

- You study Computer Science or a related discipline
- You are deeply interested in topics such as Autonomous Driving, Robotics, Deep Learning
- You are able to read and write scientific texts in English
- Programming (e.g. in Python) and Linux isn't new to you
- You show an above-average degree of initiative and commitment as well as a thorough way of working

### What You Get

- You get exciting insights into our research and gain valuable practical experience
- We use the latest hardware and software. Together with us you work in first-class laboratories (on-site or remotely)
- Regular and extensive support: Weekly 1:1 meetings, short term support if needed and participation at test-drives with our autonomous shuttle buses
- High-quality theses will be published on KITopen, with the code on GitHub
- We plan on publishing the results in an IEEE journal with shared first-authorship

### How To Apply

- Start: Immediately
- Write me an email at [orf@fzi.de](mailto:orf@fzi.de) with a short CV, your grades and a few sentences why you are interested and why you think this topic should be yours
- On acceptance, we will have a face-to-face or remote meeting to discuss details and to form the topic to your needs