

# Statistical Modelling of Vehicle Movement in Autonomous Driving

## Bachelor's Thesis

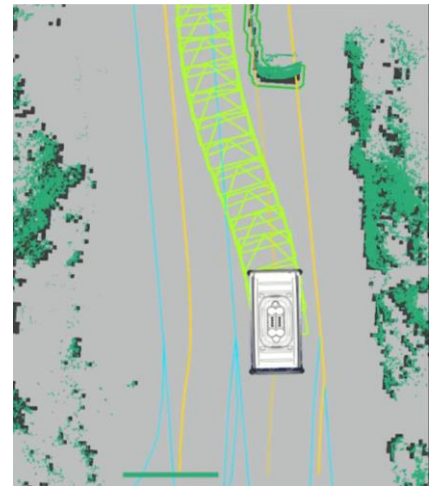
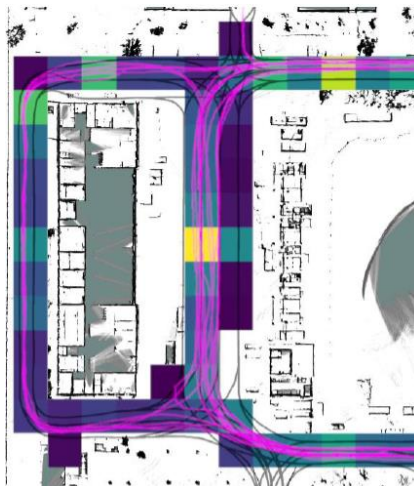
Autonomous Driving

Localization

Safety

Probabilistic Modelling

Autonomous Driving in public traffic is more present than ever. Autonomous public transport shuttles or even self-driving consumer cars are nothing new. But still these vehicles must (partially) be supervised by a safety driver. To get to real self-driving vehicles more research in proper safety concepts has to be done. One such safety approach is the automatic supervision of the movement of the vehicle. This bachelor's thesis aims at developing a failure recognition mechanism of the vehicles movement by statistically modelling driving paths.



### The Topic

- First, you will take part at test drives with our autonomous shuttle busses in Weiherfeld-Dammerstock, Karlsruhe to record trajectories of the vehicle
- With the recorded trajectories you will perform an analysis and develop a statistical method to capture the typical movement of the vehicle
- You will review existing literature of similar approaches and techniques to extend and improve your method
- For evaluation you will create a concept of inducing errors into the planned trajectory
- To evaluate your method you will recognize unusual movements of the vehicle in recordings, as well as during autonomous drives with the shuttle busses

### Your Skills

- You study Computer Science or a related discipline
- You are deeply interested in topics such as Autonomous Driving, Robotics, Planning, Statistics/Probabilistics
- 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 busses
- 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