

## Bachelor Thesis

*Practical/Programming*

### Optimization and utilization of a filtering tool for data capturing in automated and assisted driving.

*Keywords: driving scenarios, situation awareness, workload, non-driving related tasks, interface*

#### **Conditions:**

Duration: 3 Months  
Requirements: Matlab, Simulink, MS. Excel and any programming language  
Language: English  
Target groups: Bachelor students (Maschinenbau, ISE)

#### **Content:**

An autonomous driving system issues a takeover request to a human driver to resume manual control of a vehicle when it becomes uncertain that it is able to continue safe and efficient control of the vehicle. The faster the driver is able to understand the traffic scenario of the vehicle at the time of the takeover request, the more efficient the assumption of full control will be and consequently avoidance of accidents.

The quality of response from the driver is often evaluated based on a set of variables such as takeover time, situation awareness, longitudinal acceleration etc. There are different approaches employed in the analysis of these variables. In this study, the student is required to perform experiments in the driving simulator (a set of driving scenarios have already been designed) and optimize an existing tool to filter the data.



The steps related to this work can be summarized as:

- Literature review of metrics and methods for analyzing takeover performance.
- Familiarization with the driving simulator laboratory and the designed TOR experiments.
- Performance of TOR experiments (Data collection).
- Optimization of tool to automatically extract TOR variables/metrics for participants.
- Validate the tool using the collected data.
- Complete documentation of output, final presentation and thesis submission.