HUMAN-MACHINE-
INTERACTION

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Wizard-of-Oz –
The Driver's State in Real-road Automated Driving

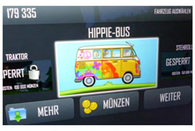
In Conditional Automated Driving (CAD) an adequate drivers' state plays a crucial role for safety reasons in case of a system initiated request-to-intervene (RtI). In driving simulator experiments a change of the drivers' state in CAD depending on different NDRTs could be demonstrated. However, it has not yet been examined in what extent these results can be transferred to the real road.

In a first approach, the devekopement of the drivers' state in CAD was examined in a Wizard-of-Oz on-road experiment resulting in the research questions:

- How does a drivers' state (fatigue) change over the course of the ride?
- How is a drivers' state affected through non-driving related tasks (NDRT)?
- To what extent are the results comparable to those from the simulator?

EXPERIMENTAL DESIGN

- Prolonged conditional automated ride in Wizard-of-Oz vehicle
- Simultaneously engaging in NDRTs (between-subjects)

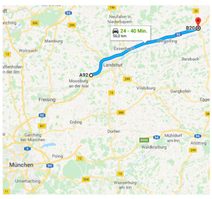


Free choice

P-q-p-d

ROUTE

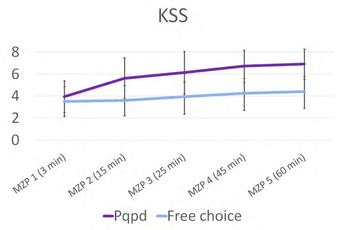
- Times of experiment & route were preset due to an exception approval
- A92
- No Autopilot in traffic jam
- No Autopilot in roadworks

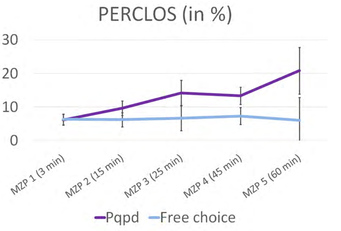


MEASURES

- Percentage of eye-lid closure over time (PERCLOS) – Measured and analysed with Dikablis head-mounted eye tracker and D-LAB 3.5
- Karolinska Sleepiness Scale (KSS) – How tired are you at the moment?
- Take-over parameters (hands-on-time, eyes-on-road time)

RESULTS





CONCLUSION

- The aim of the study was to compare results from the simulator with those in real traffic.
- The results show, that the developement of the drivers`state in real traffic is similar to the driving simulator studies.
- Significant differences in subjective and objective fatigue (KSS /PERCLOS) depending on the NDRT could be found.
- The Wizard-of-Oz method is well suited for measuring effects of automated driving on the drivers`state.

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