Chair of Media Technology
TUM Department of Electrical and Computer Engineering
Technical University of Munich

Forschungspraxis

Comparison of Driver Situation Awareness with an Eye Tracking based Decision Anticipation Model

This work can be done in German or English

The transmission of control to the human driver in autonomous driving requires the observation of the human driver. The vehicle has to guarantee that the human driver is aware of the current driving situation. One input source for observing the human driver is based on the driver's gaze.

The objective of this project is to compare two existing approaches for driver observation [1,2]. While [1] measures the driver situation awareness (SA), [2] anticipates the drivers decision. As part of a user study [2] published a gaze dataset. An interesting cross validation would be the comparison of the
SA score generated by [1] and the predicted decision correctness of [2].

Tasks

- Generate ROI predictions [3] from the dataset of [2]
- Estimate the driver SA with the model of [1]
- Compare [1] and [2]
- (Optional) Extend driving experiments

References

[1] Markus Hofbauer, Christopher Kuhn, Lukas Puettner, Goran Petrovic, and Eckehard Steinbach. Measuring driver situation awareness using region-of-interest prediction and eye tracking. In 22nd IEEE International Symposium on Multimedia (ISM), Naples, Italy, Dec 2020.
[2] Pierluigi Vito Amadori, Tobias Fischer, Ruohan Wang, and Yiannis Demiris. Decision Anticipation for Driving Assistance Systems. June 2020.
[3] Markus Hofbauer, Christopher Kuhn, Jiaming Meng, Goran Petrovic, and Eckehard Steinbach. Multi-view region of interest prediction for autonomous driving using semisupervised labeling. In IEEE 23rd International Conference on Intelligent Transportation Systems (ITSC), Rhodes, Greece, Sep 2020.

Prerequisites

- Experience with ROS and Python
- Basic knowledge of Linux

Advisors

Markus Hofbauer