

Cognitive Eye Tracking to Perceive Critical Situations



Image created with AI (MS Copilot Designer)

Unveil the secrets of safe driving! In this project, your task is to experiment with an eye tracking device to observe where test drivers are looking while driving. This should give us the ground truth to train a machine learning model to visually perceive and detect the critical information on the street (and filter out all unnecessary noise). With our cutting-edge eye-tracking technology we want to understand where drivers naturally focus their attention. By analyzing real-world test data, we'll identify critical areas of interest, providing ground truth

for machine learning models and applications that act like a copilot and can detect anomalies and potentially critical situations and warn the driver.

Goal and Tasks:

- Learn how to use and read eye-tracking equipment.
- Produce test data for evaluation and ground truth.
- Train a machine learning model to also focus on the same objects as a human driver.
- Implement a prototype and conduct a feasibility study with that.
- Write a scientific master thesis (including related work/background and evaluation).
- Defend the master thesis in a final presentation.

Recommended Prior Knowledge:

- Programming Experience in C/C++/Python/C#
- Experience with Machine Learning Platforms like Keras/Tensorflow
- Computer Vision Skills for Pupil and Eye-Gazing Detection (with e.g. OpenCV, Cameras, Object Detection)

Start: a.s.a.p.

Duration in months: 6-12 months

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