



Abschlussvortrag Masterarbeit Ehab Ghannoum

„Explainable machine learning-based detection and localization of simultaneous faults for recordings analysis of Hardware-in-the-Loop tests“

Real-time validation of automotive software systems (ASSs) is crucial to avoid potentially dangerous consequences. Hardware-in-the-loop (HIL) is recommended by ISO 26262 as a reliable, realistic simulation platform for such complex systems. However, the conventional failure analysis of HIL test records is time-consuming, extremely difficult and requires expert knowledge. Therefore, an intelligent solution is needed that can overcome the above challenges.

Despite the fruitful results of advanced machine learning-based models, most of the state-of-the-art models have been developed for single fault with a "black-box" nature and without interpreting the decision of the AI model.

In this study, a novel explainable ML-based method for simultaneous fault detection and isolation is proposed. The proposed interpretable model is developed to predict not only the location of a single fault but also the concurrent faults considering the explanation and interpretation of the model's prediction. To demonstrate the capabilities and advantages of the proposed method, a complex gasoline engine with a dynamic vehicle system is used as a case study. The dataset is generated from manual and automated virtual test drives.

Betreuer der Arbeit: PD Dr. Christoph Knieke, Dr. Stefan Wittek

Datum: Freitag, 20. Dezember 2024, 10:00 Uhr

Ort: Online-Meeting über BBB

Link: <https://webconf.tu-clausthal.de/rooms/moh-ygp-whn/join>