TU Clausthal

Abschlussvortrag Masterarbeit Harshini Vishwanatha Reddy

„Hybrid machine learning-based simultaneous fault detection and classification for recordings analysis of Hardware-in-the-Loop tests“

Real-time validation of Automotive Software Systems (ASSs) is critical to avoid possible hazardous consequences. Hardware-in-the-loop (HIL) is recommended by ISO 26262 as a reliable and realistic simulation platform for such complex systems. However, conventional fault analysis of HIL test logs is time-consuming, extremely difficult and requires a lot of effort. Therefore, an intelligent solution that can overcome the above challenges is needed.

Despite the fruitful results of machine learning-based models, most previous studies have been conducted for a single fault without considering the simultaneous occurrence of multiple faults. Simultaneous occurrence of faults is when two or more faults occur simultaneously at different locations.

In this study, an intelligent and novel method for simultaneous fault detection and classification under noisy and imbalanced data conditions is proposed. For this purpose, hybrid machine learning techniques with multi-labels are used in two stages, i.e., feature extraction and feature learning using LSTM and Random Forest (RF). 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.

Betreuer der Arbeit:	Prof. Dr. Andreas Rausch, PD Dr. Christoph Knieke
Datum:	Dienstag, 11. Juli 2023, 08:30 Uhr
Ort:	Online-Meeting über BBB Link: https://webconf.tu-clausthal.de/b/sim-uc9-rvy