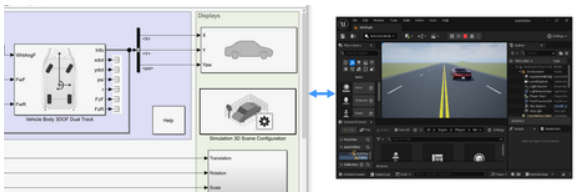
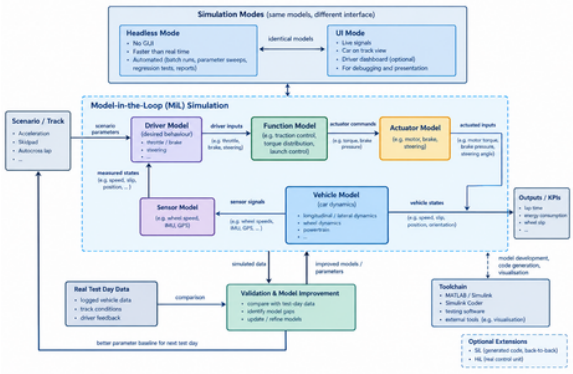


SUGGESTED TOPIC FOR SCIENTIFIC WORK

Closed-Loop Simulation for Concept Proof of Control Models



The objective is to develop a closed-loop simulation environment to test function models, such as traction control and launch control, with a vehicle model before real-world testing. Standardised scenarios, including acceleration, skidpad and autocross, will be evaluated using criteria such as wheel slip, lap time and energy consumption.
The environment will support automated simulations and parameter sweeps, as well as a graphical interface for live data visualisation and debugging. The vehicle model will be validated against real test data.



The project focuses on Model-in-the-Loop (MiL) simulation using MATLAB/Simulink, with potential extensions to SiL and HiL. The result will be a reusable platform for efficient model testing and development. The topic is merely a suggestion and must be finalised with the institute.

Tasks:

- Analyse existing models, interfaces, scenarios and KPIs
- Develop the MiL environment in MATLAB/Simulink
- Implement headless and UI modes
- Validate the vehicle model against test data
- Document the architecture and create a user guide

Requirements:

- Enrolled in a Bachelor's or Master's programme in a related engineering field
- Good knowledge of MATLAB/Simulink; testing or code generation experience is a plus
- Basic knowledge of control engineering and vehicle dynamics, or willingness to learn
- Good communication skills in English or German
- Enthusiasm for motorsport and teamwork