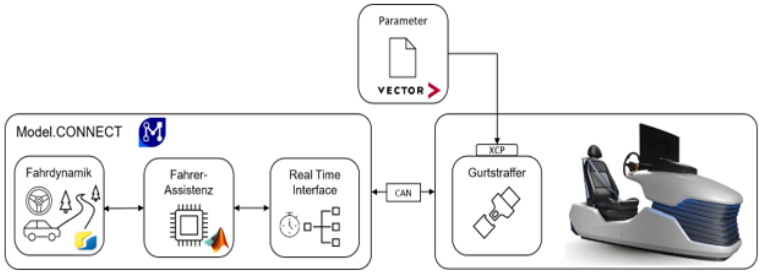
K2DM – LIL Experiment Outline

aSR Co-Simulation concept for virtual calibration

Co-Simulation and calibration of an active control retractor integrated in the aSR Driving Simulator

THE CHALLENGE

Driving Simulators enable the interaction between human drivers and driving functions. Nevertheless, they are mostly used for presentation of new features instead of unfolding its full potential and integrate them in the early development process. Especially for test rides including safety-critical driving maneuvers, they might become a reasonable option against real prototypes. To achieve this, the office-sized aSR Driving Simulator shall be extended by the neutral Model.CONNECT co-simulation platform including currently available calibration standard protocols. As a first HiL use case, a calibratable active control retractor shall be integrated while an application software is used to change its characteristics. Moreover, the retractor will be used to achieve a sufficient level of immersion while driving in the simulator and calibrate the feedback with respect to individual needs. In terms of a better comparison of the achieved results, a model of the active control retractor shall also be used for Model-in-the-Loop tests. The realized Co-Simulations shall be analysed and adapted using appropriate Co-Simulation algorithms, if necessary.



SOLUTIONS AND METHODOLOGY

Extension of an existing Co-Simulation example in Model.CONNECT via the XCP interface to enable active control retractor calibration. An XCP interface will be integrated in the Co-Simulation in two ways, a) by directly using the Model.CONNECT FMU feature and, b) by indirectly using the MATLAB/ Simulink XCP Server. Potential coupling errors will be avoided by using appropriate coupling algorithms.

RESULTS AND IMPACT

The office-sized aSR Driving Simulator including the active control retractor is embedded into a Model.CONNECT Co-Simulation for calibration purposes using XCP and CANoe. Besides integration of the real hardware, a simulation model of the active control retractor is available for realizing a Model-in-the-Loop co-simulation scenario. These achievements enable the seamless modification and parameter variation of the active control retractor for development purposes, i.e. to improve the level of immersion for a specific human driver using the aSR Driving Simulator

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