A Multifunctional Tool for Designing the HMI of Mechatronic Products

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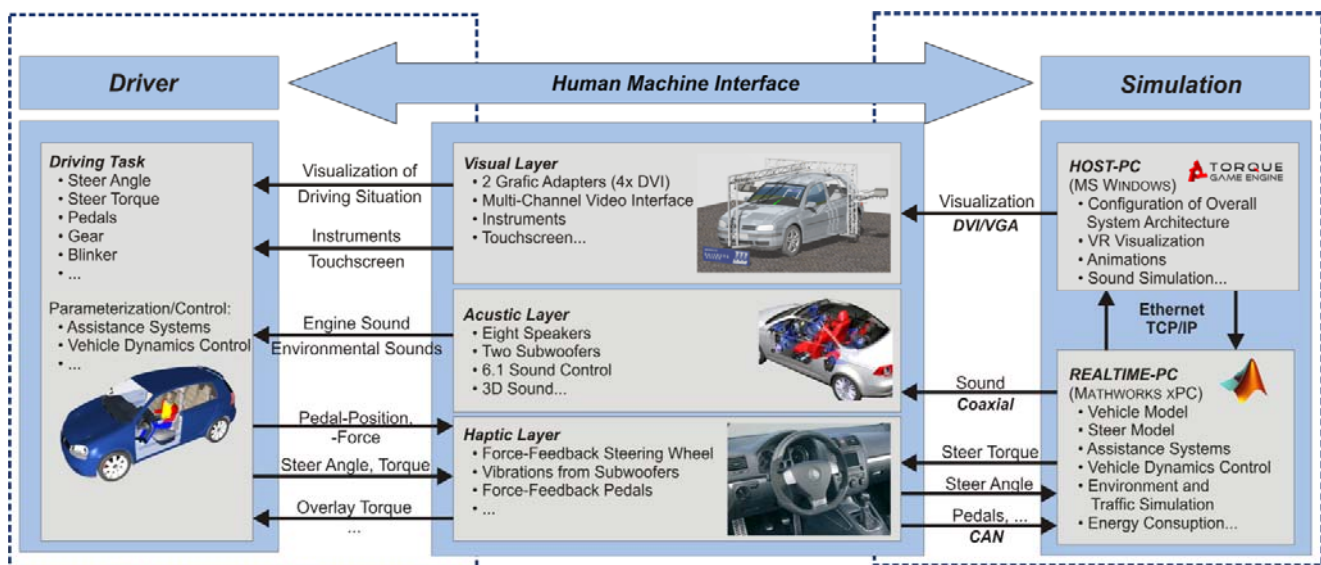
Figure 1: Simulator Struture of the DRIVASSIST Simulators

1. INTRODUCTION

Human centred mechatronic systems, such as modern driver assistance systems, are designed to simplify the use of complex systems or make them more secure. During their development there are two major issues: In addition to the technical function, the human centred characteristics of the system have to be engineered [1]. The driving simulators of the DRIVASSIST project provide the engineer with a tool to address both and make use of an advanced simulation concept provided by the mercatronics GmbH.

2. SIMULATOR STRUCTURE

The DRIVASSIST simulators work on a Matlab/Simulink basis. All vehicle models and assistance-systems were build at the Chair of Mechatronics. The user ist provided with open source code. This allows a fast implementation of new systems into the simulation environment. The open source code enables a

maximum of felxibility for simulator investigations.

2.1 REAL TIME ENVIRONMENT

The models are computed in real-time by using a xPC target (Mathworks), which is both easy to use and fairly inexpensive. The real-time simulation coupled to a force-feedback steering wheel gives the driver a realistic feeling to operate a vehicle. This is essential for studies of HMI concepts.

2.2 HUMAN MACHINE INTERFACE

The HMI is the object of investigation, but it also is an important part for any realistic driving simulator. The intention of these standard HMI is to make the driver feel sitting in a real vehicle. Therefore, the DRIVASSIST simulators are designed with different visual, acoustical and haptical elements that can be used as HMI. New set-ups that are to be tested can be added easily.

3. REFERENCES

[1] Hesse, B.; Hiesgen, G.; Brandt, T.; Schramm, D.: Ein Fahrsimulator als Werkzeug zur frühzeitigen Eigenschaftsabsicherung von Mensch-zentrierten mechatronischen Systemen; VDI-Mechatronik Wiesloch 2009