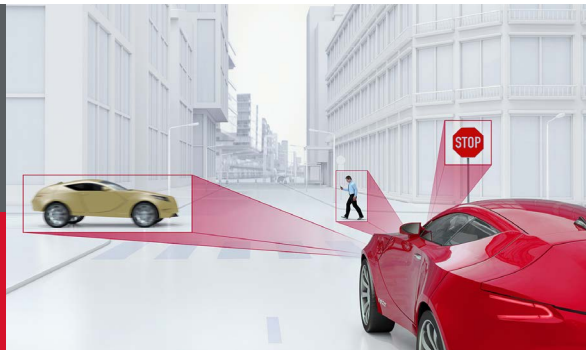
Virtual Model-In-The-Loop Test for the Development of Driver Assistance Systems

Case Study BASELABS, TASS, Vector



The Challenge

Evaluating data fusion and driving functions early in the development cycle

Due to the ever-increasing complexity of driver assistance functions, combined with the integration and fusion of different sensors, it is necessary to evaluate the performance of those systems as early as possible in the development cycle. Ideally, this is done automatically and already during the modeling phase. If vehicle dynamics influences the detection performance of the sensor system, or limiting cases need to be taken into account, the test system also needs to be able to test the Device Under Test (DUT) in a closed-loop. Having appropriate, application-specific metrics – especially for the validation of data fusion – is another requirement.

The Solution

Automated testing of the models of algorithms and functions in virtual environments

Function developers use a virtual test environment to validate multi-sensor data fusion and other driving functions – for example based on tools such as BASELABS Create and the algorithm prototyping environment vADASdeveloper – in early development phases without the real ECU hardware being available. For this they use a combination of CANoe, vTESTstudio, TASS PreScan and BASELABS KPI Tooling. Data exchange between the environment simulation, DUT and metrics tools is done via standardized interfaces such as FMI/FMU and the CANoe-built-in FDX protocol for HIL coupling.

The Advantages

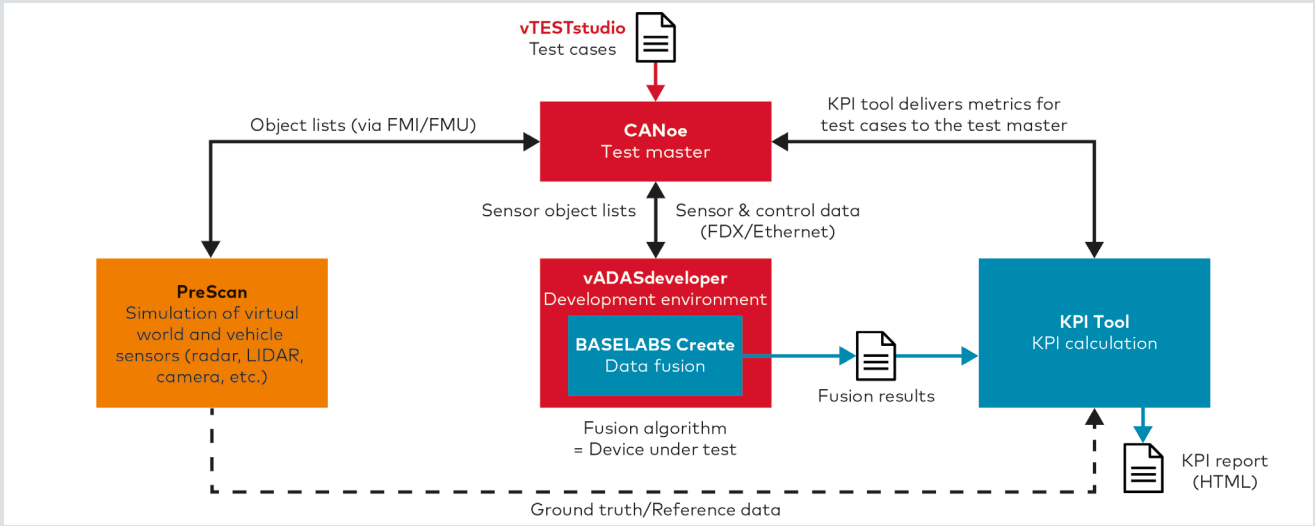
Early objective evaluation of driver assistance functions and data fusion by means of complex virtual scenarios

> With Vector CANoe, TASS PreScan and the KPI Tooling from BASELABS, users can utilize an end-to-end tool chain covering the entire test process

> Very easy integration of tools thanks to CANoe's open interfaces, convenient test design with vTESTstudio

> Realistic, detailed virtual tests of ADAS algorithms due to the flexible structure of the virtual world and precise physical simulation of the sensors in PreScan

> Objective evaluation of data fusion through the calculation of Key Performance Indicators (KPI) with ground truth comparisons using BASELABS KPI Tooling



Model-in-the-Loop test system for automated evaluation of driver assistance functions (schematic)

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