SOFTWARE VALIDATION OF CAMERA SYSTEMS

Goal of the project

The goal of the project was to implement new methods that allow automation tests for embedded software of stereo camera systems. The stereo camera system is called ECU (electronic control unit).
Automation tests are tests that are implemented in a suitable environment (for instance CANoe) and which generate a final verdict, passed or failed, without any intervention of the test engineer.

Main activities. Results

Two of these tests are presented in the following paragraphs.
The first test involves the Power Mode Control component. Thus, the power module of the camera system generates more voltages in a predefined order. Each voltage has a transition from zero Volts to the final value. This value must be within a required range. If the final value is outside of this range the software must report a so-called DEM (Diagnostic Event Manager) event.
The software test must simulate that after the voltage transition, the final value is outside the range and then it has to check if the DEM event was generated.
The test was implemented in CANoe. The following devices are controlled by CANoe: the external power supply of ECU, the DEDITECH equipment and the ECU (error memory). DEDITECH is a special equipment that mainly contains a DAC (digital to analog converter) and a switch with two positions. Thus, it allows either the voltage generated by the internal power supply of the ECU (ATIC), or the voltage generated by DAC to be connected to the microcontroller of the ECU. The aim of this project was to identify a method which can detect the transition of the voltage that must be integrated in CANoe among the existing test. Thus, in this project the LeCroy oscilloscope, which is GPIB compatible, was employed to detect the transition.
The second test involves the Heater component and is presented below.
The Heater is a device that is mounted between the camera and the windscreen of the car. It has the function of heating the surrounding area to prevent occlusion of the camera due to snow or ice that can be outside on the windscreen.
The heater actually represents an 8 ohms resistor that is periodically connected (this time is called Ton) or disconnected (Toff) to the 12V voltage of the car. The values of the Ton and Toff depend on the exterior temperature Text. They have larger values for smaller temperatures (for instance Ton = 500 sec and Toff =600 sec for Text = -37 degrees) and smaller values for higher temperatures. This test must verify if the dependence of the two times on the temperature is according to the requirements.
Thus this test is made by increasing the external temperature in steps of two degrees from the minimum value of -37 degrees to the maximum value of 51 degrees to cover the entire range and measure the Ton and Toff at the same time.

Implementation period

6.01.2017-31.12.2017

Financed through/by

Continental Automotive SRL

Research team

Septimiu Mischie

Contact information

Conf. Septimiu MISCHIE, PhD
Faculty/Department Address:
Str.Vasile Parvan, No2. 300223, Timișoara
Phone: (+40) 256 403 364
Mobile:
E-mail: septimiu.mischie@upt.ro
Web: