

Designing and Implementing a Software Watchdog for Fault-Tolerant Automotive Safety Electronics

Task

In order to meet the trend of the increasing complexity concerning the implementation of in-vehicle functions in software-intensive systems, automotive functions are separated into so-called software components. In doing so, multiple software components can be mapped onto one ECU. Mapping multiple software components onto one ECU, which can be supplied by different developers, makes the conventional error detection mechanism, such as the watchdog timer, insufficient for future safety systems. In order to achieve higher dependability of in-vehicle safety electronic systems, one resolvent called Software Watchdog, will be introduced as a standard dependability software service in the EU-project EASIS for software platforms. The software watchdog is supposed to monitor the execution of programs compliantly to the mapping concept of the upcoming standard.

Goals

- Assessment of different approaches/functionalities of the software watchdog
- Design of an appropriate concept
- Development of a virtual prototype with Matlab/Simulink
- Rapid prototyping of the software watchdog on the platform MicroAutoBox of dSPACE
- Evaluation of the prototype with an appropriate evaluation case

Student

- Juejing Feng

Tutor

- Xi Chen (Daimler Chrysler)
- [Dr.-Ing. Falk Salewski](#)

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