

Design and Implementation of a Drive-by-Wire Architecture

Task

Currently, intense efforts are being made in the automobile industry for the cause of establishing basics for distributability and hardware-independent relocatability of particular software functionalities over the control units in a vehicle. One possibility within this context is the aggregation of several functionalities to just a few high-performance control units. Another point is the fact, that new safety-critical functionalities in a vehicle (e.g. drive-by-wire) demand new requirements considering the architecture of the respective controllers.

Serving as a basis for further examinations, the task of this thesis will be the designing and implementing of a drive-by-wire architecture for our model vehicle. The important point is, that it is intended to insert a high-performance control-unit (main controller) on which software functionalities can be moved on demand. During the work, the following has to be examined:

- What basic requirements are needed considering the components (HW and SW) and the architecture of a drive-by-wire architecture in terms of safety?
- What pros and cons result from the relocatability of single software functionalities and what functionalities are actually suitable?
- How can such a relocatability be provided in general?
- How is such a main controller to be created in order to fulfill the requirements of relocatability of software functionalities and safety, as well as qualities such as power consumption, reliability, performance, costs etc.?

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