

Collection and Comparison of Design Principles Considering Technology-Independent Modelling in the Automobile Industry

Task

Within the sector of automotive electronics there has been a historical development of heterogeneous, domain-oriented electronic control units. These units, however, are not cost-efficient and impede the realisation of new functions. The processing of domain-spanning functions, which have an influence on the functionality of the entire vehicle, requires an infrastructure that allows a distribution and shift of software functions within the network of electronic control units at design time.

For that reason, this thesis examines how platform-independent design principles, that exist throughout the prevailing literature, allow technology-independent modelling of software functions. Besides the approved middleware-based principles, the automatic transformation of model-driven architecture is addressed. An empirical example illustrates how one can abstract from the bus system and the hardware of electronic control units.

A middle-ware layer, which needs to be installed on every control unit, allows a shift from software not only to design time, but also to run time. On the other hand, the effort of the automatic transformation of technology-independent modelled software on several hardware platforms seems to be problematic.

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Last update: 2009/06/12 09:31

