Model-based Requirement Verification : A Case Study

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This paper presents a complete case study that takes a real Fuel Display System element used in Scania Trucks and applies an unified process for modelling system requirements together with the system itself and verifying these requirements in a structured manner. In order to achieve this process the system is modeled in Modelica, and requirement verification scenarios are specified in ModelicaML and verified with the vVDR (Virtual Verification of Designs against Requirements) approach [1].

As electronic systems become increasingly complex, so do the requirements that they must fulfill, both in terms of functionality and safety. Thus, maintaining the conformity between the system requirements and the system implementation manually becomes increasingly difficult and unproductive.

The reasons for choosing vVDR approach are its requirements formalization approach, its scalability and the level of possible automation. The way requirements are formalized detects inconsistencies or incompleteness of requirements, it allows expressing requirements monitors using the same formalisms that are used to formalize designs or scenarios, and it allows determining which requirements can be verified using simulations.

References

[1] Wladimir Schamai, Peter Fritzson, Christiaan J. J. Paredis, and Philipp Helle. Modelicaml value bindings for automated model composition. In *Proc. of Symposium on Theory of Modeling and Simulation (TMS/DEVS 2012)*, 2012.