

Model-based system development with Silver and TestWeaver

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The presentation targets developers of control software for automotive, aerospace or similar applications. The presented tools - Silver and TestWeaver - support cheap but in-depth system validation on Windows PCs, enabling test-driven optimization during development. Both tools operate on simulation models, developed e.g. using Modelica.

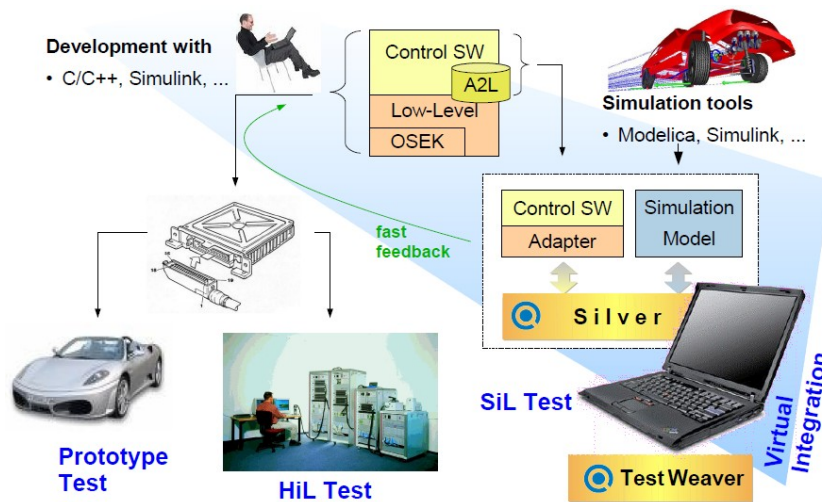


Figure 1: Automotive software development with Silver and TestWeaver

For testing a system, TestWeaver does not require any test scripts. Instead, TestWeaver generates, runs (i. e. simulates) and evaluates thousands of tests, e.g. driving or flight maneuvers, automatically by itself. TestWeaver generates tests not randomly, but in a reactive, informed way, trying to actively worsen scenarios that are already sub-optimal until system behavior is really bad, i.e. a bug has been found.

Main advantage of TestWeaver for developers of control software:

- high test coverage: orders of magnitude better compared to script-based testing
- low work load for engineers: no writing of test scripts

We also present Silver, a tool used by automotive development engineers to integrate and test control software virtually using simulation on Windows PCs. Silver provides built-in support for automotive standards such as A2L, MDF, CAN, and XCP to perform co-execution of control software and of vehicle simulation models. Silver also supports the FMI (Functional Mockup Interface), which greatly simplifies the import of models from simulation tools such as Dymola and SimulationX into the Silver test and development environment. Both tools are used by Mercedes [1], AMG [2], Continental, IAV, ZF and others.

References

- [1] Chrisofakis et. al.: Simulation-based development of automotive control software with Modelica. 8th International Modelica Conference, Dresden, Germany, 2011.
- [2] Tatar, Schaich, Breitingner: Automated test of the AMG Speedshift DCT control software. 9th Int. CTI Symposium Innovative Automotive Transmissions, Berlin, 2010.
- [3] Junghanns, Mauss, Tatar: TestWeaver - A Tool for Simulation-based Test of Mechatronic Designs. 6th International Modelica Conference, Bielefeld, 2008.
- [4] Papers on <http://qtronic.de/en/weaver.html> and <http://qtronic.de/en/silver.html>