

# Abstract

In the past decade, one of the main goals in automotive embedded software development was to unify and standardize software architectures. The AUTOSAR Consortium was founded on this purpose in 2003 as a partnership of automotive OEM's (Original Equipment Manufacturer) and suppliers. Its major objective is to specify a basic structure of services, enhancing software reusability by the standardization of module interfaces.

In order to declare the conformance of a software module developed according to an AUTOSAR standard, it must be verified that it fulfills the static and dynamic requirements of the specification. There are several methods for implementing and executing conformance tests, from which the optimal solution shall be chosen, considering financial and resource-related terms.

In this Thesis the corresponding testing methods and the available tools are presented first, followed by the description of the conformance testing process of an AUTOSAR Basic Software module via two different methods: the official AUTOSAR Conformance Test Suite of the module, which is implemented in TTCN-3 language and another test suite, implemented in C.

In this context, conformance testing basics are summarized along with the corresponding definitions. The System Under Test, its place and function in the AUTOSAR software architecture are presented, as well as the relevant properties of TTCN-3 language. In the following, two widely-used TTCN tools are compared and the CUnit testing framework is presented. The adaptation of the runtime environment to the System Under Test is described for both TTCN-3 and CUnit, as well as the conformance testing process, its results and the further development options.