Fraunhofer FOKUS

FRAUNHOFER INSTITUTE FOR OPEN COMMUNICATION SYSTEMS FOKUS

AXBENCH – AUTOSAR EXTENSIBLE WORKBENCH

Contact
Dipl.-Inf. Marek Feldo
System Quality Center – SQC
Phone +49 30 3463-7443
Fax +49 30 3463-997443
marek.feldo@fokus.fraunhofer.de

Fraunhofer FOKUS
Kaiserin-Augusta-Allee 31
10589 Berlin
Germany

www.fokus.fraunhofer.de/go/axbench-en
http://axbench.sourceforge.net

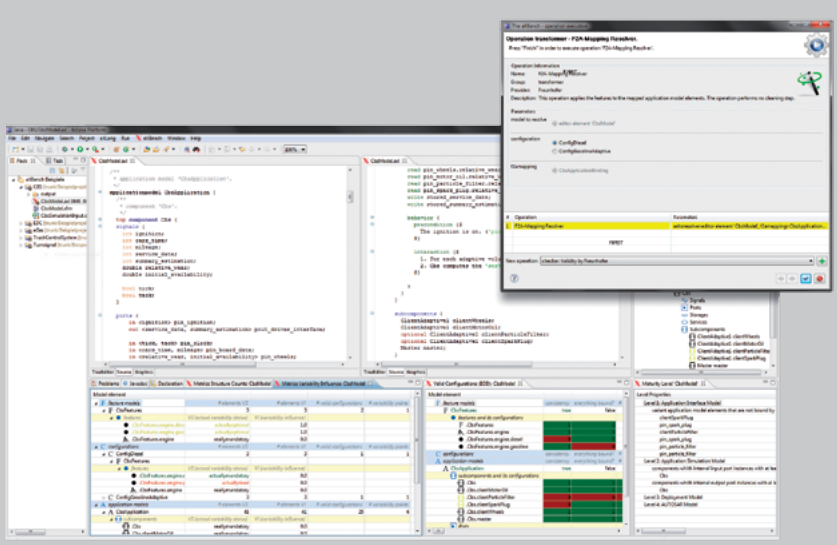
Variant Diversity in Automotive Systems

Software has become an integral component of modern automobiles. It takes on the most versatile functions and is already distributed across up to 80 control units from different suppliers today. The challenge arising from this scenario is that the devices and their software must work together error-free even in seemingly trivial vehicle functions such as electric window lifters and need to be adapted individually to an increasing model diversity. In order to simplify the development of such systems in the future and to guarantee high quality, manufacturers and suppliers in the automotive industry across Europe, Asia, and the USA have joined forces with manufacturers of software development tools in the AUTOSAR initiative (Automotive Open System Architecture) to commit to the standardization of architectures, interfaces, and basic control unit software. The AUTOSAR standard is expected to lead to cost reductions for automotive systems while at the same time increasing the quality of the software. Fraunhofer FOKUS is a partner in the AUTOSAR initiative and is involved in developing this standard in the "System and Control Unit Configurations" group. The aim of this workgroup is the variant management for individual automotive systems and the standardization of exchange formats for the configuration data supporting the various opportunities for collaboration between manufacturers and suppliers.

aXBench

The development of systems according to AUTOSAR needs to be integrated into the development processes of automakers and suppliers. With the aXBench, Fraunhofer FOKUS has established a prototype for the function-oriented development of embedded systems in a vehicle.

aXBench – Function-oriented Software Development in Automotive Engineering



The software supports essential development steps such as modeling of vehicle functions and their distribution onto hardware as well as analysis and evaluation of such specifications. The aXBench considers a multitude of vehicle variants when modeling the functions, thus allowing for an individual adaptation of the software. At the same time, all vehicle variants are managed in only a single joint model. For modeling, the aXBench uses the architecture description language aXLang that was specifically designed for system families with features, software, and hardware. The import and export into various formats (e.g. AUTOSAR, SystemC, XML) is intended.

Early Evaluation of the Development Process

The analysis of function descriptions facilitates the evaluation of a model's maturity level and of the compatibility of function interfaces early on in the development process. Using the software, varying designs for the distribution of application components across control units may be generated and assessed. The user can select different configurations or products of the product family and generate their system descriptions automatically. The generated system designs can then be subjected to a system evaluation and tested for their qualities. The aXBench may be extended via Eclipse extension mechanisms with import or export filters and evaluation components. The programming interface is available as open source software.

What we offer

The conversion of development and production from E/E (electrical/electronic) systems to AUTOSAR will constitute an important economic factor for manufacturers and suppliers in the automotive industry in the future. The aXBench makes it possible to realize different system variants in automotive engineering in compliance with the AUTOSAR standard. The software allows for the evaluation of different system solutions early on in the development process, thus saving costs and raising the quality of the software. The aim is the efficient construction of automotive systems. With the aXBench, Fraunhofer FOKUS is introducing a tool that can be embedded in the existing tool environment. The import and export of individual formats in addition to AUTOSAR facilitates a smooth adaptation to existing development processes, models, and tools. Fraunhofer FOKUS will advise you on adapting the aXBench to your needs. We will further analyze your development processes, tools, and methods for the conversion to AUTOSAR.

Services

We will oversee the conversion to AUTOSAR with:

- Process consulting
- Employee training
- Pilot projects
- Documentations of applications and work processes (e.g. for AUTOSAR user manuals)

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