SystemC AMS Day 2011

Industry Adoption of the SystemC AMS Standard

BLOCK 1: SYSTEMC AMS FOR SYSTEM INTEGRATORS

Automatic Transformation of MATLAB/Simulink Models to SystemC AMS

Nico Bannow, Robert Bosch GmbH, Germany
Ralph Görgen, OFFIS Institute, Germany
Wolfgang Nebel, University of Oldenburg, Germany

The rising complexity of modern embedded systems and the ongoing integration of analogue and digital components lead to new challenges in verification. Analogue and digital parts have to be evaluated together as early as possible in the design process. For this reason, methods for the comfortable and fast simulation of mixed signal models are essential. In this contribution, a tool is presented that allows the automatic generation of SystemC AMS modules from Simulink models.

To do so, the existing code generation with Real-Time Workshop was extended to generate not only a C++ representation of a Simulink model but as well an appropriate SystemC AMS wrapper and a test-bench in SystemC AMS to validate the result. With this, a very easy coupling of analogue parts of a system, designed in Simulink, with digital parts, described in SystemC, becomes possible. In addition, a simple API was defined and added to the code generation that allows dynamic access to model parameters at run-time. As a result, large test series with changing parameter values can be run automatically. Two examples from the domain of automotive electronics are used to show the equivalence of the generated SystemC AMS models and to compare its simulation performance with Simulink.