Use of Domain-Specific Languages for the
Development and Configuration of Embedded Controllers

Speaker: Dr. Michael Golm, Siemens Corporate Research

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Abstract:

Future cars will reach a level of intelligence that will make them more similar to the electronic gadgets of our kids than to the cars of our parents. Developing these systems requires a completely new approach to their architectures and development methodologies. The presentation describes how Domain-specific Languages (DSLs) can be used in the development of this new breed of embedded controller software. The approach of the AUTOSAR (Automotive Open System Architecture) consortium is used to illustrate the important role of DSLs in an emerging industry standard. To highlight some important research topics a research DSL is presented. Specifically, this DSL allows for development of embedded controller software in time-triggered, distributed systems. Based on a meta-model imported from an industry standard, It provides visual and textual system representations from multiple viewpoints, automatic model completion based on high-level timing constraints, configurable platform-specific code generation, variant management, and various additional visualizations and editors for increased productivity. The presentation highlights experiences and recent improvements of DSL workbench tools, and explains how domain-specific modeling can systematically be applied to address the increasing complexity of embedded controllers.

Biography:

Michael Golm is the Program Manager for the "System Architecture and Platforms" team of Siemens Corporate Research (SCR) in Princeton, NJ. His team is responsible to provide software and system architecture and platform technologies support for all Siemens business units in the USA. Before Michael joined SCR he worked for Siemens Corporate Technology (CT) in Munich. From 2004 to 2008 he represented Siemens VDO Automotive as a system architect in the AUTOSAR consortium. The AUTOSAR consortium consists of all major automotive OEMs and suppliers. The consortium developed a standard for the system and software architecture for all vehicle domains (body, chassis, powertrain, p&p safety). During his time at CT Munich and SCR Princeton Michael worked as an architecture consultant for a large number of Siemens business units, including building technologies, energy automation, energy smart grid, healthcare diagnostics, hospital information systems and intelligent traffic solutions. Michael has expert knowledge in distributed embedded systems, real-time systems, safety-critical systems, and operating systems.

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