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Tutorial

T1 - AADLv2, a Domain Specific Language for the Modeling, the Analysis and the Generation of Real-Time Embedded Systems

Sunday September 28, 2014 (9:00 -12:30)

Location: Green Cube - Sala Crea (4th Floor)

Chairs: Frank Singhoff and Jérôme Hugues

Summary: The Architecture Analysis and Design Language (AADL) is an SAE International Standard dedicated to the precise modeling of complex real-time embedded systems, covering both hardware and software concerns. Its definition relies on a precise set of concepts inherited from industry and academics best practices: clear separation of concerns among layers, rich set of properties to document system metrics and support for many kind of analysis: scheduling, safety and reliability, performance, but also code generation. In this tutorial, we provide an overview of AADLv2 and illustrate how several analyses can be combined on an illustrative example: a radar platform. In this tutorial, we also present Model-based engineering process allowed by AADL to both verify and implement automatically a real-time embedded system. The tutorial will be composed of four parts. Part 1 will be an introduction to AADLv2 core. In this part we will present the syntax and semantics of the AADL. Part 2 will introduce the radar case study to illustrate the use of AADL. Part 3 will address scheduling analysis. We will introduce real-time scheduling theory and who it can be used to access schedulability of AADL models. Finally, Part 4 will be dedicated to code generation. We will present how to generate code from an AADL model and how it can be run.