COTS Component-Based Embedded Systems
– A Dream or Reality?

Ivica Crnkovic[1], Jakob Axelsson[2], Susanne Graf[3], Magnus Larsson[4],
Rob van Ommering[5], and Kurt Wallnau[6]

[1] ivica.crnkovic@mdh.se, [2] jaxelss5@volvocars.com,
[3] Susanne.Graf@imag.fr, [4] magnus.larsson@se.abb.com,
[5] rob.van.ommering@philips.com, [6] kcw@sei.cmu.edu

Embedded systems cover a range of computer systems from ultra small computer-based devices to large, possibly distributed, systems monitoring and controlling complex processes. COTS-based development in embedded systems, with electronic and mechanical components has a long tradition. However component-based development (CBD) with software components, in particular COTS components, is utilized to a lesser degree. A major reason is the inability of component technologies to cope with specific requirements of embedded systems. In general, component-based technologies do not address timing issues, QoS, dependability, resource constraints, and other extra-functional properties of crucial importance for embedded systems. This raises the question whether Component-based and COTS-based approach is beneficial for development of embedded systems, and which are the specifics to be addressed to make such an approach feasible.

The aim of this panel is to discuss the needs and problems with respect to a component based approach in the context of embedded systems and come to some conclusion about the feasibility of COTS and CBD approaches for embedded systems. The following questions will be in the focus of the discussion:

- Will COTS and CBD be the dominant approaches in the future, or will these approaches never overcome the problems of today?
- Which are the crucial factors and the main challenges for a successful adoption of COTS component-based development of embedded systems?

The panelists are reputed researchers and experienced industrial experts in different application domains of embedded systems (automotive, consumer electronics, and automation industries) and component-based software engineering. The statements will include the following topics:

- Ivica Crnkovic, Prof., Mälardalen University, moderator: An overview of embedded systems. State of the art and practice of CBD in embedded systems.
- Jakob Axelsson, Program Manager, Volvo Cars: Using COTS in automotive industry; main requirements and constraints and their impact on the development.
- Susanne Graf, Senior Researcher, Verimag: Modeling component-based real-time systems.
- Magnus Larsson, Research Manager, ABB: Using COTS in process automation industry. Main concerns and requirements and their impact in using COTS.
- Rob van Ommering, Senior Researcher, Philips: Product-line approach and CBD. Feasibility of using COTS components in consumer electronics industry.
- Kurt Wallnau, Senior Researcher, Software Engineering Institute/CMU: Achieving predictable composition of COTS components.