“Compositionality and Modularity in Embedded System Design: Interface Theories and Interface Synthesis”

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Abstract
Compositional methods, that allow to assemble smaller components into larger systems both efficiently and correctly, are not simply a desirable feature in system design: they are a must for designing large and complex systems. In this talk I will present some of our recent work on this general theme in the context of embedded systems. In particular, I will discuss two theories of relational interfaces: synchronous relational interfaces, targeted at synchronous systems, from digital circuits to hierarchical block-diagram based languages such as Simulink; and actor interfaces, targeted at dataflow models and performance properties such as throughput or latency. I will also present some work on modular code generation from hierarchical synchronous and dataflow models, based on the same principles of interfaces and interface synthesis.

Biography
Stavros Tripakis is an Associate Research Scientist at UC Berkeley. He obtained a PhD degree in Computer Science at the Verimag Laboratory in Grenoble, France, in 1998. He was a postdoc at UC Berkeley from 1999 to 2001, a CNRS Research Scientist at Verimag from 2001 to 2006, and a Research Scientist at Cadence Research Labs in Berkeley from 2006 to 2008. His work lies in the areas of embedded, real-time and distributed systems, model-based and component-based design, verification, testing and synthesis. Dr. Tripakis is co-Chair of the 10th ACM & IEEE Conference on Embedded Software (EMSOFT 2010) and the current Secretary/Treasurer of ACM SIGBED.