

Combining Languages in Embedded System Design

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Often, several languages with different underlying models of computation are used in the design of an individual embedded system. The languages are selected because of their particular suitability for certain applications and optimizations, or because they have become generally accepted as a standard within an application field. The lack of coherency of the computational semantics, methods and tools is a significant obstacle on the way to higher design productivity and design quality. A similar problem occurs when reused components shall be integrated, possibly described in another language and incompletely documented. Examples are reused components or “legacy code.”

The talk will start with a short overview of important models of computation. Then, different techniques to consistently combine model semantics are presented. We explain how to use such models for system analysis and scheduling. The embedded tutorial will conclude that unified languages are no necessity in system design and that a single language will face similar problems in system optimization as a combination of current system design languages.