Model-based Software Synthesis of Cyber-Physical Systems
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Introduction

Challenges on CPS software design:
• Complexity (e.g. 100 million lines of code in a premium car).
• Stringent requirements on timing and other design metrics (performance, reliability, extensibility, etc.).
• Usage of multicore and distributed platforms.

Current practice:
• Lack of timing consideration in task generation.
• Gap between task generation and task mapping.

Our approach:
• Model-based software synthesis (MS2) framework that integrates task generation and task mapping with consideration of timing and other related design metrics.

MS2 Framework

Functional Model | Design Objectives | Approach
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Results

- Synthesizing Synchronous FSMs
- Synchronous Block Diagrams (single-rate, single-core)
- Synchronous Block Diagrams (multi-rate, multi-core)