

Contract-Based Analysis of Automotive and Avionics Applications: The SPEEDS Approach

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Abstract. The Speeds project has developed a layered meta-model of heterogeneous rich components and standardized approaches for the integration of commercial industry standard modeling tools to assemble system-level design models with contract-based interface specifications by combining models expressed in any authoring tool compliant to the integration standard, including Matlab-Simulink/Stateflow, Rhapsody, and Scade. It is currently integrating a range of analysis methods supporting interface compliance testing and dominance analysis between contracts expressed in extended automata model, subsuming timed automata. The presentation focuses on real-time analysis methods, and demonstrates a methodology for assessing realizability of end-to-end latencies at system level, exploring the design space of possible system configurations meeting vertical resource assumptions, and assessing compliance to such vertical assumptions based on distributed real-time schedulability analysis for FlexRay and CAN bus based target architectures.