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A Verification Plan for Systematic Verification of Mechatronic Systems

Today, verification of mechatronic systems has become a major cost factor in mechatronic system development. Yet the prevalence of model-based development opens new opportunities for automatized verification. Extensive functional verification of mechatronic models has become a necessity. Current mechatronic system verification approaches exhibit a major gap between requirement definition and formal property definition, though.

The shortcomings of current mechatronic development and verification are discussed with respect to verification planning and with respect to current developments in the domain of electronic design. Requirements for a verification plan for mechatronic system verification are formulated. Based on these requirements an Enhanced Classification Tree Method is developed, based on the established Classification Tree Method CTM/ES. The new notation and method is embedded into a verification plan definition for automatic testbench execution. It supports automatic generation of stimuli, automatic acceptance evaluation and test quality evaluation. A unified notation facilitates horizontal and vertical re-use of descriptions for more efficient definition of a verification plan. The method has been embedded into a current design flow for mechatronic system development.