

Model-Based Design and Production Code Generation in Embedded Systems

MS CpE Scholarly Paper by Yu Qiao

Advisor: Dr. Kris Gaj

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Abstract

In this paper, the current progress of Model-Based Design (MBD) and Production Code Generation (PCG) in Embedded Systems have been investigated and summarized. First, the concepts of Model-Based Design and Production Code Generation are introduced. Two representative MBD methodologies and tools are compared and classified for different applications in embedded systems. This comparison is the unique work based on my own application experience and other engineers' industry practice.

Then, Matlab/Simulink as the main stream tool in MBD and PCG is selected and studied in detail as the further research work of this paper. The following topics are covered:

- The Development Process for Matlab/Simulink MBD and PCG
- The tips of Matlab/Simulink MBD and PCG for C/C++ code
- Verification and Validation for Matlab/Simulink MBD and PCG
- The tips of Matlab/Simulink MBD and PCG for HDL code
- A Case study for MBD and PCG

Finally, I present a summary and conclusions on the use of MBD and PCG for the efficient development of applications in embedded systems.