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**A case study in embedded systems design: An engine control unit.** (English) Zbl 1030.68634  
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Summary: A number of techniques and software tools for embedded system design have been recently proposed. However, the current practice in the designer community is heavily based on manual techniques and on past experience rather than on a rigorous approach to design. To advance the state of the art it is important to address a number of relevant design problems and solve them to demonstrate the power of the new approaches. We chose an industrial example in automotive electronics to validate our design methodology: an existing commercially available Engine Control Unit. We discuss in detail the specification, the implementation philosophy, and the architectural trade-off analysis. We analyze the results obtained with our approach and compare them with the existing design underlining the advantages offered by a systematic approach to embedded system design in terms of performance and design time.

**MSC:**

- [68U99](#) Computing methodologies and applications
- [68M99](#) Computer system organization
- [93C83](#) Control/observation systems involving computers (process control, etc.)

**Keywords:**

[hardware/software co-design](#); [hardware/software co-simulation](#); [architecture selection and mapping](#); [engine control](#); [automotive applications](#)

**Software:**

[Ptolemy](#)

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