A Methodology for Simulation and Synthesis of Mixed Hardware/Software Systems

Asawaree Kalavade    Edward A. Lee

Department of Electrical Engineering and Computer Science
University of California, Berkeley
Berkeley, CA 94720 USA
kalavade@foucault.eecs.berkeley.edu
eal@eecs.berkeley.edu

Abstract

A methodology for designing embedded DSP systems containing interacting hardware and software components is presented. The software typically comprises a program running on a programmable digital signal processor and the hardware consists of the processor, custom synthesized hardware modules, and the interface between the two. The methodology allows the designer to begin with a high-level dataflow description of the algorithm and generates a simulation model as well as a synthesizeable description for the entire system. We have implemented this mechanism within the Ptolemy framework as a heterogeneous target called the Design Assistant.