Assignment 1: Embedded Systems Overview and Microprocessors Review

Total: 85 points

Received: 9/8/2008

Due: 4:00 p.m., 9/22/2008

1. [15, Embedded System Design Flow Example]
   Summarize the design procedures used in the following paper:
   T. Cuatoo, *et al*., "*A Case Study in Embedded System Design: an Engine Control Unit*," in Proc. of DAC'98, pp. 804 – 807.

2. [15, Embedded System Design Environment Example]
   Summarize the design tools used in the following paper:
   C. Liem, *et al*., "*An Embedded System Case Study: the FirmWare Development Environment for a Multimedia Audio Processor*," in Proc. of DAC'97, pp. 780 – 785.

3. [15, Embedded System Optimizations Example]
   Summarize the optimization techniques used in the following paper:
   W. Wolf, B. Ozer and T. Lv, "*Smart Cameras as Embedded Systems*," IEEE Computer, vol. 35, no. 9, pp. 48 – 53, September 2004.

4. [30] StateCharts is a popular specification language for reactive systems, which was introduced by David Harel in 1987. Read his 1987 paper, "StateCharts: a Visual Formalism for Complex Systems," and explain how the following boxes from Figure 31 of the paper behave: stopwatch, beep-test, and alarm2-status.

5. [10] Generalize Amdahl's Law to handle multiple enhancements, assuming only one enhancement can be used at a time during program execution. Assume that f_i is the fraction of time that enhancement i can be used and s_i is the speedup of enhancement i.