CSE 990-001: Cyber-Physical Systems HW #1

Assigned: 2015-08-25
Due: 2015-09-01 in class

Homework Overview

The objective of this homework is to familiarize you with what CPS is (mostly from my point of view), and to introduce you to the literature, as well as offer an informative tutorial on real-time control.

HW #1

1. Read J. M. Bradley and E. M. Atkins, "Optimization and Control of Cyber-Physical Vehicle Systems," Sensors (conditionally accepted), 2015
2. Read J. M. Bradley and E. M. Atkins, "Toward Continuous State-Space Regulation of Coupled Cyber-Physical Systems," Proceedings of the IEEE, vol. 100, pp. 60–74, January 2012
   (a) Read only sections I and II.
3. Answer the following questions (typed):
   (a) What is a CPS?
   (b) What is CPS research?
      i. How is it different from research areas robotics, embedded systems, control, real-time systems, and research sub-categories in those areas? Or is it any different?
   (c) Define "cyber" for CPS and give examples. NOTE: there is NO clear definition in the community so you won't be wrong...just be thoughtful in your answer. We will discuss this more in class.
   (d) Define "physical" for CPS and give examples. NOTE: there is NO clear definition in the community so you won't be wrong...just be thoughtful in your answer. We will discuss this more in class.