

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

Assigned: 2016-08-23

Due: 2016-09-01 in class or by email before 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. I also anticipate that you'll do #1 below before class on Thursday as it will prepare you for the next two lectures.

HW #1

1. Read: E. A. Lee, "The Past, Present and Future of Cyber-Physical Systems: A Focus on Models." Sensors, 2015
 - (a) Please read this before class on Thursday.
2. Read: J. M. Bradley and E. M. Atkins, "Optimization and Control of Cyber-Physical Vehicle Systems," Sensors, 2015
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.
 - (e) What is required in the development of new models for CPS?