Agenda:
1. Define CPS.
2. More details of the class.

CPS?: are smart networks of embedded sensors, processors and actuators that are designed to sense and interact with the physical world (including human users), and support real-time guaranteed performance in safety-critical applications. In CPS, the joint behaviour of the “cyber” and “physical” elements of the system is critical.
Computing, control, sensing and networking are deeply integrated into every component, and actions of components and system must be carefully orchestrated.

**Embedded System**: is an application that contains at least one programmable computer (microcontroller, microprocessor, DSP chip) and which is used by individuals who are unaware that the system is computer based.

CPS: "systems you can bet your life on!"
Drivers:
- Transportation
- Manufacturing
- Healthcare
- Energy
- Agriculture
- Defence
- Emergency Response
- Society (social connection)

Focus:
- principled, & scientific approach (s) to designing & implementing CPS.
- model-based system design

Cross-cutting issues
- Safety
- Cybersecurity
- Privacy
- Economics
- Interoperability
Modeling: is process of gaining a deeper insight/understanding of a system through imitation. Models specify what a system does.

Designing: is structured creation of artifacts. It specifies how a system does what it does.

Analysis: is a process of gaining deeper insight of a system through dissection. It specifies why a system does what it does (or fails to do what a system is supposed to do).
HW due Sep 3

1. CS: computing/cyber system
   PS: purely a physical system

2. CPS: mostly physical with some cyber.

- give examples, characteristics of each.
- problems/errors/bugs in each type of system.

2. Read "Computer needs time". And write a critique. ACM May 2009 Vol 52 (5)