

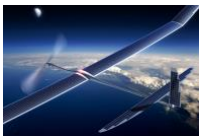






Interested in 5G, 6G, and networked embedded/cyber-physical systems?

CPR E 548: Cyber-Physical Systems Networking

Spring 2021
(*Online & Hybrid delivery modes*)

Overview

Seamlessly integrating sensing, networking, and computation with the control of physical devices and processes, cyber-physical systems (CPS) are expected to transform the way we interact with the physical world. Accordingly, CPS will have far-reaching impact on science and engineering and are critical to a wide range of applications such as **augmented reality (AR), smart agriculture, smart transportation, Industrial 4.0, and smart energy grid**. One basic enabler of CPS is embedded networking of sensors, controllers, and actuators. In supporting mission-critical, real-time, and closed-loop sensing and control, embedded CPS networks represent a paradigm shift from traditional wired and wireless networks, and it is critical to ensure controllable, predictable communication quality in CPS in the presence of uncertainties. **CPS networking is also major focus of 5G and 6G wireless systems!**

This course is designed for students who are interested in CPS in general and CPS embedded networking in particular. We will examine a wide range of **topics** including CPS applications (e.g., AR/VR, smart ag, smart transportation, industrial automation, smart energy grid, smart health), field area and control networks (e.g., HART, Sercos, PROFIBUS, PROFINET), industrial Ethernet, time-triggered communication, fundamentals of wireless communication (e.g., wireless channel, signal propagation, modulation, link models), real-time wireless networks, wireless industrial networks, 5G, 6G, safety and security of industrial networks, as well as systems and innovation platforms for CPS networks.

Prerequisites

CPR E 489, CPR E 530/430, COM S 486, or equivalent (e.g., undergrad. networking course)

Class timings: Tue Thu 3:40pm-5:00pm
Section: 0384700 (online) / 0384005 (hybrid)
Credits: 3
More course information: http://www.ece.iastate.edu/~hongwei/index_files/container.html#548
Instructor: Dr. Hongwei Zhang, hongwei@iastate.edu, +1 515 294 2143
http://www.ece.iastate.edu/~hongwei/

For more information, please check the course syllabus or contact Prof. Hongwei Zhang.