CSE190 Fall 2023
Lecture 1
Introduction

Wireless Embedded Systems
Aaron Schulman
CSE190: Wireless Embedded Systems

Goal: Provide a hands on introduction to the design of wireless embedded systems.

Class will focus broadly on how to program a fully functional wireless embedded system.

By the end of the course, you should be able to operate in a team that is building a product involving an embedded system.
Logistics

• **Instructors:** Aaron Schulman
  – TA: Tyler Potyodony

• **Lectures:** M/W/F 10:00am-10:50am

• **Office hours:**
  – Aaron: M/W 11:00am-12:00pm in CSE 3154
  – Tyler: Tu 11:30-2:30pm Th 2:00-5:00pm

• **Web:**
  • Course website: [http://cseweb.ucsd.edu/classes/fa23/cse190-e](http://cseweb.ucsd.edu/classes/fa23/cse190-e)
  • Discussion Forum: Piazza via Canvas
Lectures & Assignments

• Lecture slides will be posted on the course website

• Four assignments
  – Due approx. every two weeks

• Assignments will be low-level C firmware programming
  – Important to do them to keep pace in class
  – Collaboration will be limited to Piazza posts and Office Hours
Project & Exams

• Course project: build a battery-powered embedded sensor that transmits data to a smartphone.
  – Individual projects
  – You will have your own embedded systems hardware
    – Please fill out signup sheet on Piazza

• Two exams class (based on projects and in class)
  – Midterm Exam: Th Nov 8 (in class)
  – Final Exam: Th Dec 15 (8am-10am) :sad:
Grading Logistics

• **Overall Class Grade**
  – Four Assignments: 60%
  – Midterm Exam: 20%
  – Final Exam: 20%
What do computers look like today?

• Computing systems are everywhere
• Most of us think of computers as a platform for people:
  – PC’s
  – Laptops
  – Servers
  – Smartphones

• But there’s another type of computing system
  – They are far more common...
Wireless embedded systems: The computing platform for *things* (aka the *Internet of Things* aka *Smart[ABC]*)
The components of an embedded system

Analog Systems
- Tiny MEMS sensors
- Tiny RF
- Integrated Circuits

Embedded systems
- Programmable Microcontrollers
- Tiny sensors
- Wireless networks

Digital Systems
- Inexpensive computation
- Easy-to-use frameworks
Typical Microcontroller