IoT Sensing Systems

Instructor
Utku Günay Acer
Email: utku.acer@sabanciuniv.edu
The course will be taught online.

Course Description
This course gives an in-depth study of the technologies involved in the Internet of Things with a specific focus on networked sensing systems. This includes processing sensor data and making inferences using it in various platforms at the edge of the network. This course has a strong emphasis on hands-on experience.

Prerequisites:
CS 204
A basic understanding of computer organization, operating systems, and networks is necessary. Ability to write computer programs in a high-level language (such as Python and C or C++). Familiarity with Linux and shell environments.

Covered Topics
1. **Introduction to Internet of Things:** Examples of mobile and embedded systems and sensors.
2. **Sensing:** Review of signal processing and machine learning on sensor data
3. **System Considerations:** Networking issues at the edge, energy preservation, local/remote computation.
4. **Privacy in Sensing:** Sensor data and privacy
5. **Mobile/Embedded Computing & Wearables:** On-device sensing with smartphones, embedded devices, and wearables
6. **Edge Computing:** Remote inference with sensor data
7. **Cool Applications:** Localization, activity tracking, smart homes, mobile health, etc.

Textbooks
No textbook is required. The course is based mainly on research papers that will be provided for each lecture.

Grading
Students will be assessed based on smaller implementation assignments and a final project. They are encouraged to propose their projects. While assessments can be performed individually, they will form groups of 3 or 4 for the final project.