Syllabus: Low-Power Internet-of-Things Systems

Outline

1. Low-power IoT system architectures: nodes, hubs, cloud.
2. Event-driven systems: event timing models, system capacity.
3. Embedded sensors: motion, temperature, light.
4. Mixed-signal interfaces for signal conditioning and detection.
5. Hardware/digital/analog design of embedded sensing devices.
6. Models for power consumption and performance in IoT devices.
7. Low-power embedded software analysis, optimization.
8. Networking for IoT. Edge networks such as Zigbee, Bluetooth Low Energy, WiFi. Internet backhaul.
9. Hubs for IoT devices. Comparing and synthesizing from multiple edge devices.
10. Network models for power consumption and performance.
11. Safety and security of IoT systems: methodologies.
12. Safety and security of IoT systems: design techniques.
13. Design studies of IoT systems. Examples may include manufacturing, medical, vehicles.

Grading

- Four in-class tests totaling 20%.
- Course project 40%.
- Final exam 40%.

Rules for in-class quizzes and final exams: open book, open notes (both paper and electronic); closed Internet.

Disability Accommodation

You can request accommodations through our public New Student Accommodation Request Form. We will begin reviewing new student requests June 22; we recommend students attend FASET and register for their courses prior to their initial intake appointment. In the meantime, please review the documentation guidelines of your disability diagnosis information; when you submit your Accommodations Request, you will need to upload your documentation, so please make sure it meets the University System of Georgia's guidelines.

Honor Code

Academic Integrity: Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or http://www.catalog.gatech.edu/rules/18/. Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Student-Faculty Expectations Agreement: At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See http://www.catalog.gatech.edu/rules/22/ for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and

cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Institute Absence Policy

See http://www.catalog.gatech.edu/rules/4/ for policy on absences.