Project Guidelines

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Steps

1. Come up with your favorite topic
2. Form a team
3. Proposal: propose a design and plan
4. Analyze and implement your solution
5. Evaluate your solution
6. Demo 1, 2 and Final Demo
7. Write a technical report
Topics

- **Option A: Build IoT systems based on cloud and edge**
  - Front end: Raspberry Pi…
  - Cloud and edge: storage, analytics, Alexa, notification, Greengrass

- **Option B: Build a real-time system**
  - Explore how to achieve and optimize real-time performance

- **Encouraged to address latency**
  - Measuring latency (mean, variance, tail)
  - Impacts of different configurations (e.g., edge vs. cloud) on latency
Start Early and Work Often!

- Choose topics
- Put together a team
- Meet every week to coordinate
- A lot of work (and fun) throughout the semester!
Teaming

- Everyone should be in a three-member team
  - Need special approval from TA for a different size

- Use **Piazza** to “Search for Teammates”

- Email Corey your team members by **2/4**
  - One email per team

- We will help make sure everyone has a team.
Proposal Presentation

- In class on 2/9

- **6 min** per group
  - 5-min talk + 1-min Q&A
  - 3-4 slides
  - Rehearse over Zoom
  - **Turn on your video** during your presentation

- Your **elevator pitch**!
Written Proposal

- One proposal/team, one page
  - Team members
  - Concise description of project
  - Responsibilities of each member
  - Equipment needed

- Submit on Canvas by **2/9, 11:59pm**
  - Written proposal
  - Presentation slides
Demo I

- In class on 3/9 and 3/11
- 12 min per team
  - 10-min presentation + 2-min Q&A
- Must show something real.
- Submit on Canvas before the class of your presentation.
  - Slides
  - Video as backup
Demo II

- In class on 4/6 and 4/8
- **12 min** per team
  - 10-min presentation + 2-min Q&A
- Substantial progress towards final demo.
- Submit on Canvas before the class of your presentation.
  - Slides
  - Video as backup
Final Demo

- In class on 5/4 (1pm - 3:15pm)
- 12 min per team
  - 10-min presentation + 2-min Q&A
- Set up and **test** your demo in advance.
- All should attend the entire session. It’ll be fun!
- Submit on Canvas before class
  - Slides
  - Video as backup
Final Report

- Submit on Canvas by **5/11, 11:59pm**.

- **Report**
  - Style follows conference papers in the reading list
  - 6 pages, double column, 10 pts font
  - Use templates on the class web page

- **Materials**
  - Web page
  - Slides of your final presentation
  - Source code
  - Documents: README, INSTALL, HOW-to-RUN
  - Video
Suggested Report Outline

Abstract

1. Introduction
2. Goals and Requirements
3. Design
4. Implementation
5. Experiments
6. Related Works
7. Lessons Learned
8. Conclusion and Future Work
Peer Review

- For fairness in group projects.

- Email me on 5/11
  - Percentage of contributions of each team member.
  - Brief justification.
Follow-Me Music
Spice Bot: Spice-Blend Automation

- 3D-Printed Prototype
- Voice-Control-Interface
  - Amazon Echo
- Actuator Control
  - Raspberry Pi
- Control Command Interpretation
  - AWS IoT

BY ALEX HERRIOTT, QUOC NGUYEN, RAYMOND JONES
Car Informatics in the Cloud

- Pull real-time OBD data from a car
- Upload to the Cloud and display stats at real-time

BY Ethan Vaughan, Frank Sun, and Adith J. Boloor
Smart Lock

- Remote doorway system
  - Live video
  - Arrival (motion) detection
- Web application
  - Node.js server on an EC2 instance
  - Live video via ssh tunnel
  - Engage/disengage lock

BY Charles Ahrens Feldman, David Ayeke, and Steven Bosch
Latency of Edge Computing

- Benchmark and optimize latency with edge computing

AWS IoT Greengrass
https://aws.amazon.com/greengrass/