



# **CS 6018**

# **Application System Design**

**Instructor:** Varun Shankar  
**TA:** Soumyajit Saha



# Introduction

- This course will teach you to build a modern Android app.
- We will focus on 3 components.
- **App Development:** learn to develop an app with a responsive, efficient, and aesthetically pleasing UI.
- **Sensor programming:** learn to tap into the Android sensor framework, and read and process data.
- **Cloud Integration:** learn to integrate a cloud backend to your app. We'll use Amazon AWS.



# Introduction: App Development

- Learn to develop a single app for many form factors and devices.
- App development requires a good understanding of event-driven programming, the lifecycle of Android apps, about OS resources, efficiency and battery usage, etc.
- App development also forces you to think about aesthetics, the right use of colors and styles, and many design principles.
- This is a great way to actually learn general programming and design principles.



# Introduction: Sensor Programming

- Android lets you tap into a variety of sensors.
- Accelerometers, magnetometers, gyroscopes, light sensors, even temperature and pressure.
- Android also lets you create custom sensor types that are based on existing hardware sensors.
- You will learn to read this raw data, process it to get some meaningful information.



# Introduction: Cloud Backend

- We'll learn how to integrate an AWS backend into our Android app.
- You'll learn the standard pattern of having a local database backed up on the cloud.
- Time permitting, we'll also do some standalone hands-on work on writing web servers in a couple of different frameworks.



# Project Details

- 3 projects.
- Each project adds on to the *same* app. You will be developing **one** app over 10 weeks.
- Why only one app? You learn application system design principles: how to develop a single app piece by piece.
- In addition, we'll have checkpoints for projects where you're graded on your progress.



# Project Details

- We'll do short 10-minute presentations for Project 1, and then a longer presentation for the final app (which includes Project 3 material).
- I will pretend I'm the client, and tell you what functionality I want from each project.
- You decide how to implement my features, whether you need to modify some of my instructions, and why you did so.
- You document your choices and discuss them in your presentation.
- This is your chance to not only polish up your programming skills and ability to work in a team, but also to show off!

# Labs

- You will also have an in-class **lab session** after each lecture. You won't be graded on this, but you will be asked to do certain tasks related to each lecture.
- The labs will be vital to understanding the concept discussed in that day's lecture!
- If you do the labs diligently, you will excel in your project.
- Your project presentations must go over project code. We'll be happy to do informal code reviews of your projects, but nothing in class (may change).



# Administrative Details

- My office: MEB 3112. I will hold office hours in the class (MEB 3145) twice a week starting next week. As usual, I will be available on Slack.
- Soumyajit will hold office hours as well.
- We'll be doing ~1 hour of lab work most days, guided by me and Soumyajit.
- We will not be following a book for this course. I will be recommending free online tutorials occasionally, but these are optional.



# Class Meeting Pattern

- Class is scheduled for Monday, Wednesday, 9 am to 12 pm (this includes lab time).
- **Class will be in-person starting next week.**
- Our classroom is MEB 3145.
- In-person lectures will also be livestreamed via Zoom, and recordings will be uploaded to Canvas.
- Please wear masks in class! My wife works with immunocompromised patients.



# Questions?