

CS 410: Advanced Software Engineering Reid Holmes

Lecture Summary

- Administrivia
- Expectations
- Project
- **Quick Assignment**



Dates and Times

- Lectures in DMP 110 MWF @ 1300 1350
 - I will be available after but not before
 - Classes will often comprise of a video portion that you are to watch in advance; in-class time will be spent on collaborative design activities.
 - The video material will not be reviewed and will be integral to the activity.
- Tutorials/Labs will _NOT_ be held this year
- TA Hep will be by via Piazza <- All public questions here
- Office Hours will be by appointment

Why flip?

Looking back at past course feedback, the

number one **Student request**

was for the course to be more

concrete.

Directory

- Instructor: Dr. Reid Holmes
 - Office: ICCS 309 (by appointment)
 - Email: rth.se2@gmail (ensures best response)
 - TA: Giovanni Viviani
 - TA: Daniel Almeida
 - TA: Sohrab Salehi
 - TA: Bruce Li

IMPORTANT: Please do not leave your messages to the last minute or expect a response time of less than 24h.



Slide/Video Availability

I will mostly work on the board

Slides and video will be available online

- The course web page will be updated by EOD Friday for the next week's lecture
- The slides will not be heavy on concrete examples as these will be covered in class.

- In-class activities will not be posted.

The slides/videos cannot take the place of the lectures



Textbooks

- No textbooks are required
- These may be helpful:
 - Software Architecture: Foundations, Theory, and Practice
 - Essential Software Architecture
 - Freely available to students in digital form
 - Design of Design
 - Mythical Man Month
- Links are provided on the web page along with slides for SA and ESA



Class Survey

- 140 total students
- 9/10 want to be here
- 1/5 have taken/will take a compilers course
- 1/3 have taken/will take a systems course (415/416)
- 1/2 are in coop
- 1/4 have worked in industry (outside of coop)
 - 1/4 have encountered architecture
 - 1/2 have been involved in automated testing
 - 1/2 have performed code reviews
- 3/4 want to design and build software as a career



Intended Learning Outcomes

- By the end of the course you should be able to:
 - Critique an existing system architecture.
 - Differentiate how various architectural styles <u>enhance</u> and <u>degrade</u> a system's functional and non-functional properties.
 - Generate and justify an architecture and design for given a collection of requirements.
 - Understand and apply <u>modern</u> software development tools and practices.
 - Create, implement, and validate a novel software system.



My Expectations

Be professional

questions in class, email, interacting with TAs

Attend lectures

talk to class or team mates if you are away

Participate

during discussions, activities, group project

-> What you get out of this class will be directly proportional to how much you participate.



Project

- Will be completed in teams of four
 - Select your own teams
- If you do not have a team by Sept 18 or your team is too small, we will sort it out in class
 - (you _will_ be assigned to a team, so please try to find one yourself/fill up your team)
- We will provide an online system to submit your groups. For now, just make sure you all have each other's Github Ids
- Projects will be managed through a private Github repo that we will provide



Project (Mobile Apps)

- Goal:
 - To make something useful
 - To learn something new
 - To leverage current technology
 - To have *fun*

Project Goal

- You will define and build a mobile app; you will:
 - Make something useful
 - Learn something new
 - Leverage current technology
 - Have *fun*

Project Constraints

- Your app cannot:
 - Require crowd involvement:
 - You can integrate with social networks etc. but it must be useful for as few as two users
 - Be a CRUD application
 - Be a web front-end

App platforms

- Must be demoed on a mobile phone from any of the following platforms:
 - iOS, Android, BlackBerry, WindowsPhone, FirefoxOS, Tizen
- App should conform to the platform (e.g., support hardware back button if available while hiding onscreen navigation controls).
- Integrate with appropriate platform services.
- Apps _MUST_ be written in either Javascript or a language that compiles to Javascript (e.g., Typescript, CoffeeScript, GWT) and deployed to



Project Motivation

This is an **Opportunity** to do something _great_. The project is flexible and is worth a significant portion of your final grade. Use this to design and build something special.



Project Warning

We expect you to each work ~5 hours per Week on the project. **Successful** projects typically range from 10-20 KLOC. Do not underestimate the development effort this project will require.





Group Grub



https://youtu.be/SLtbLE9uMbs





Mezzo



https://youtu.be/kF5iAplmhvo













REID HOLMES - CPSC 410: ADVANCED SOFTWARE ENGINEERING

Motcha



https://youtu.be/8ocWvAQWgYU



REID HOLMES - CPSC 410: ADVANCED SOFTWARE ENGINEERING

iPad 중		11:41 PM ► 🖇 78% 🖾
		WormHole
File	¢	
F		
Final Fantasy Versus XIII T in HD!.flv	railer	
Р		
Planking.flv		
т		
TopGear.flv		CITED INST
b		
bdota.flv		the second s
S		
sc.flv		
		and the second sec
		Videos Music Share Progress



Point

Mark locations

https://www.youtube.com/watch?v=Qxg3vLJY74M







HACK

Description

- H.A.C.K is a mobile app that controls and monitors electronic devices remotely.
- The app communicates with a special piece of hardware in the user's home.



MoPhoCon



Turn your mobile phone into a controller for your PC!





Project Radius >> Gameplay





REID HOLMES - CPSC 410: ADVANCED SOFTWARE ENGINEERING

Demention



https://www.youtube.com/watch?v=DqT9uCcfKQA





Project Deliverables

- Deliverable 0: Background (Pass/Fail)
- Deliverable 1: Group formation (Pass/Fail)
- Deliverable 2: Project proposal + presentation (5%)
- Deliverable 3: Architecture Oral Exam (15%)
- Deliverable 4: Prototype demo (5%)
 - PIVOT
- Deliverable 5: Testing & Reflection Oral Exam (15%)
- Deliverable 6: Project presentation + video (10%)



Project Scaling

Project deliverables: 50%

(project + bonus) * scale = project grade

- Scale will range between 0.75 and 1.0 (25 points)
 - 5: completeness (compared to proposal)
 - ► 5: utility
 - 5: polish
 - 10: difficulty

Assessment

- Project deliverables: 50%
 - + 2% best proposal (most useful + best idea)
 - +2% best prototype demo
 - +2% best final demo (most useful + best app)
 - +2% accepted to curated app store
- Midterm exam10%
- Final Exam 40%
- Some project deliverables will be pass/fail
- MUST pass final exam and ALL pass/fail elements



Why Javascript?

- Javascript is the only cross-platform language supported by modern mobile devices
- App will still run in a native container
 - Cordova / Phonegap required; this provides:
 - Native wrapping tools
 - Plugins for (almost all) native OS features
 - e.g., TouchID, Bluetooth, Play Services, native mapping, sqlite, IAP, HealthKit
 - Modern toolchain (e.g., NPM, web dev stack)
- Must be a greenfield project



D2: Project proposal

- Submission: Sept 28
- Presentation: Sept 28/30/Oct 2, in class
- Value: 5%

- Written description of your project.
- In-class 3 minute 'pitch' to the class.

D3: Project Architecture

- Submission: Nov 2
- Oral Exam: Nov 2/3/4/5/6 (30-45mins)
- Value: 15%
- A medium-length description of your app's architecture and design, and why you made the design decisions you did will be submitted by email.
- Each group will take part in a 30-45 minute oral exam describing (and answering questions about) their architecture and contribution to the project.



D4: Prototype demo

- Submission: Nov 2
- Presentation: Nov 2/4/6 in class
- Value: 5%

- Apps will be demoed in class.
- ► ~4 minutes per group.
- Apps should be ~80% complete.





REID HOLMES - CPSC 410: ADVANCED SOFTWARE ENGINEERING



Pivot

Response (from me): Nov 9

- The architecture and design of your app will facilitate certain kinds of software evolution.
- As your client, I will ask for some kind of new feature or other change.
- You will add this feature to your project for the final demo, and reflect on how your design enabled / inhibited this change.



D5: Project Reflection

- Submission: Nov 30
- Oral Exam: Nov 30/Dec 1/2/3/4 (30-45mins)
- Value: 15%
- A medium-length description of your app's validation strategy, how the concrete and conceptual architecture differed, and how your project satisfied its desired NFPs.
- Each group will take part in a 30-45 minute oral exam describing (and answering questions about) the project and each team member's contribution to the project.



D6: Presentation + Video

- Submission: Nov 30
- Presentation: Nov 30/Dec 2/4 in class
- Value: 10%

- A short description of how the project turned out, along with a reflection on the pivot will be submitted by email.
- Final demos (~4 minutes) will be given in class.



Academic Integrity

collaboration vs. plagiarism collaboration vs. cheating

This is important. The project will have team and individual components.



Deliverable 0

- On a piece of paper write:
 - First paragraph:
 - Your name and a high level overview of development experience. Include a sentence about what you would like from this course.
 - Second paragraph:
 - A description of how you have encountered architecture/testing/static analysis/code review in your experience.
 - Due at the end of class; deliverable is Pass/Fail.
 - Leave paper on the front desk.



Upcoming Deadlines

- Form project groups (we will talk about this on Sept 18 in class if you do not have a group!)
 - Online submission by 0800 Sept 19:
 - Make sure everyone has a Github Id
 - This is important; if this is not done on time, you cannot pass
- Deliverable #1: Project proposal
 - Submission 0800 Sept 28
 - Short presentation in class
 - Start thinking about this now!

A Plea

If you are planning to drop from this course, please do it by Friday as new students cannot be added after Monday.

