

CSE 622: Advanced Computer Systems

Instructors

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Homepage (piazza)

<https://piazza.com/buffalo/fall2014/cse622/home>

Office hrs: 3-5pm Wednesday (or by appointment)

Course Objectives

- Comprehensive introduction and understanding of Android Framework/kernel
 - Everything that supports the apps
 - Emphasis on kernel and program analysis
- Provide background in classic computer systems and modern mobile systems research
- Project, project, project...
- 4 assignments designed to get you up and running
- Many research ideas for you to choose from
 - Today only - We welcome your ideas as well
- Meet thrice a week: 2 days of presentations and 1 for project meetings

Tentative Schedule

- First 1/3rd of the semester: Overview of Android framework/ kernel + readings from classic computer systems
 - Reading assignments before class
 - Post comments on Piazza
 - Building/programming assignments
- Second 1/3rd of the semester: Code/Literature survey presentations by student groups
 - Android components related to the group's project
 - Readings in Mobile Systems
- Final 1/3rd of the semester: Code review meetings, Project presentations, Mobile systems paper readings
- Demo day (last day of class) - 12/5

Administrivia

- Questionnaire



Project Ideas

1. Using Multiple Network Interfaces Concurrently: latency-sensitive flows, and usage policy
2. Understanding the impact of app memory pressure in Android
3. Location Services API
 - Incorporate precision
 - Use NFC tags for stigmergy?
4. Understanding social interaction using bluetooth
5. Smart Services: Can we use activity monitoring to make system services more efficient?
 - Adaptive network resource discovery
 - Smart GPS sampling for location

Project Ideas

6. Programming model for Audio/video computation
7. Automated backup using Dropbox/Box/Gdrive
8. Resource Accounting in the OS using wakelocks
9. Making the Android Kernel Real-time
 - Ashmem
 - Binder
10. Query/sensor management for personal analytics
11. Google Glass Visual Inertial Navigation

Assignment 1

- Download and build the open-source Android (AOSP).
- Involves,
 - Setting up Linux (Ubuntu 12.04 LTS) on your personal machine for building Android,
 - Cloning the repositories,
 - Figuring out how to compile the Android source, and
 - Showing us compiled images running on the emulator.
- By next Wednesday
 - Set up Ubuntu 12.04 LTS and clone the repositories.
 - At least try to build it once.
 - You need this to follow the lecture on Wednesday.
 - This takes a lot of time. Start today.