

MOBILE APPLICATIONS OVERVIEW

21W.789 CLASS 1

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Is this class for you?



- Today is an overview of topics/methods
- Project-based class
 - ▣ Teams of 3-4 to design, build, and document a novel mobile application
- Small assignments along the way
- Classes split into lecture and studio/sharing/review time – Attendance and participation expected!

The Syllabus

Date	Topic	Reading (before class!)	In Class Group Activity	Assignment (due next class)
2/3	Mobile Applications Overview: Overview of research areas in mobile computing. Discussion of the domains and structures of mobile applications. Discussion of how mobile technology is changing communication patterns.	None	Share interests, begin to form project groups	Mobile observation study
2/10	Generative HCI Methods: Methods to generate applications ideas grounded in user needs. Performing analysis of user data to generate concept ideas.	Contextual Design	Affinity analysis of observation study	Proposal
2/24	Interaction Design: Going from a concept to flows and screens. Touch vs. 5-way navigation. Mobile interaction.	Applying UCD to Mobile Application Development	Get to "rooms" stage of user environment diagram for your application	Completed user environment diagram
3/3	Paper Prototyping/Usability Evaluation: Taking an interaction model down to the design of screens. Rapid prototyping and evaluation. Discovering usability problems early.	Prototyping For Tiny Fingers	3-4 screens prototyped, usability testing	Complete paper prototype
3/10	J2ME Programming: Creating applications for mobile devices. Differences to desktop Java. MIDlet lifecycle. GUI, networking, storage classes. Other mobile programming environments (iPhone, Android).	J2ME Development Guide	Share application designs	Create HelloWorld and show it running on your phone.
3/17	Mobile Location: Novel applications of location in social, media tagging, and public safety applications. Mobile location technology including GPS/CellID/Wifi localization.	ZoneTag , Place Its	Discuss anticipated technological hurdles	Count the Cell IDs visible on campus
3/31	Persuasive Applications: A new field of mobile applications that aim to get people to work out, be green, and more aware of themselves and the world.	UbiFit Garden , Persuasive Games	Share latest design iterations. Discuss Cell ID assignment	Make a mobile application that uses the camera.
4/7	CHI Guest Lectures: The top conference on Human Computer Interaction is in Boston and three of the top mobile HCI researchers will come to share their research.	TBD	None	Prepare code module to share with class
4/14	Code Sharing: Present code modules to share with the rest of the class.	None	Share latest progress.	Continue working on final project
4/28	TBD (games, ecosystem, mobile business models, etc): Cover a topic of interest to the class and related to topics of final projects.	None	Share latest progress.	Continue working on final project
5/5, 5/12	Final Presentations	None	None	Final written report due Friday, May 14, noon in Ed Barrett's office (14N-336).

Devices

- For those not choosing to develop on their own devices (decide by 2/24 – in proposals)
- Will lend one per team
- **Motorola ZN5**
 - Wifi
 - 5MP Kodak camera
 - Traditional 12-key keypad
 - J2ME programming and native Linux environment



Mobile Computing is Everywhere

An Internet-connected computer in 3 billion pockets...

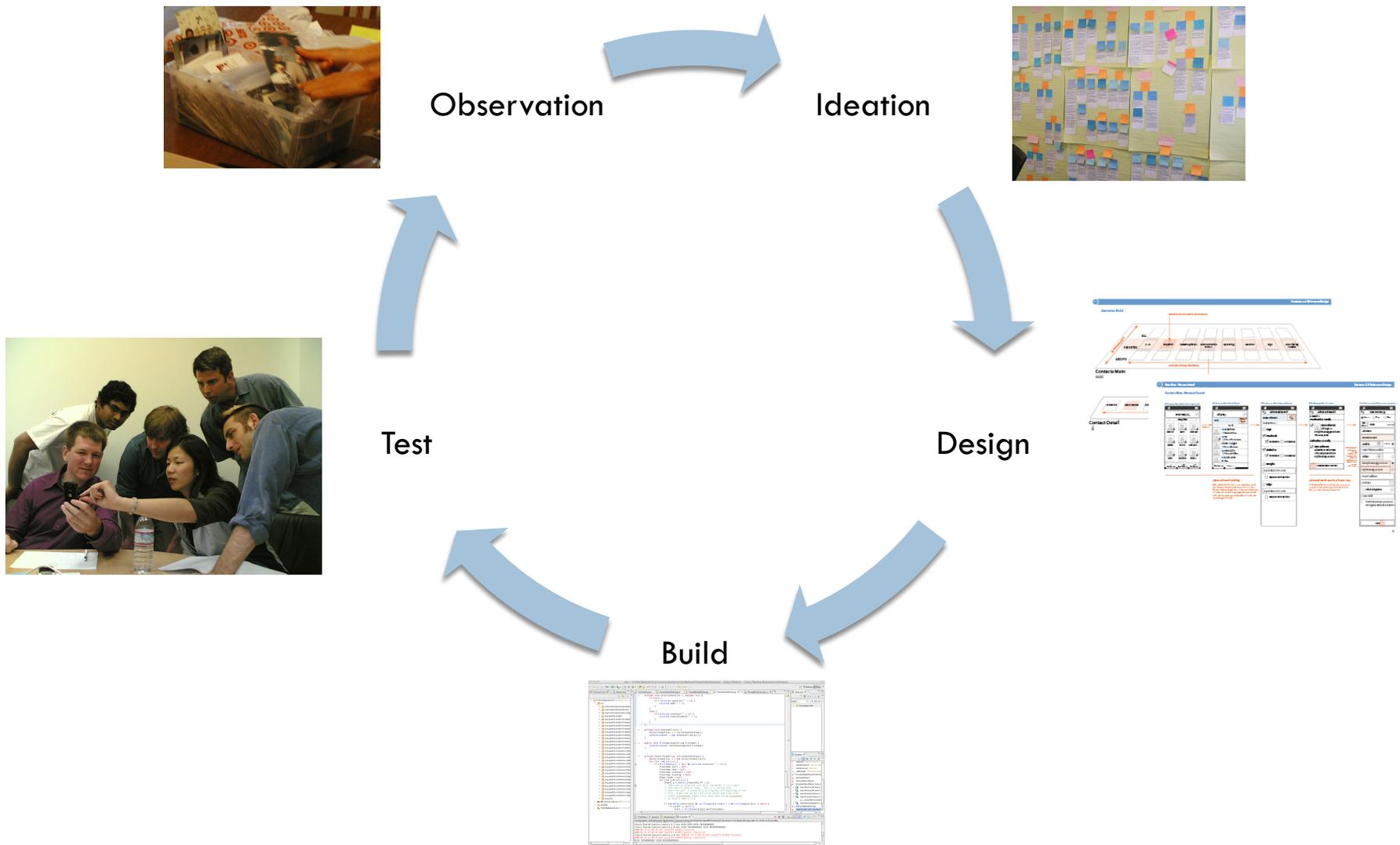


Why study mobile computing?



- Changing lives of many
 - Farm Prices
 - Microfinance
 - Live Media Sharing
 - Constant Access to Information
- Mobile Applications Becoming Ubiquitous
 - iPhone App Store
 - Android Marketplace
 - J2ME Portals from Carriers

Much more than just writing the code



Inspiration for design

- Learning from people
- In-situ observations of related practices
- Grounding new designs in real-world behavior



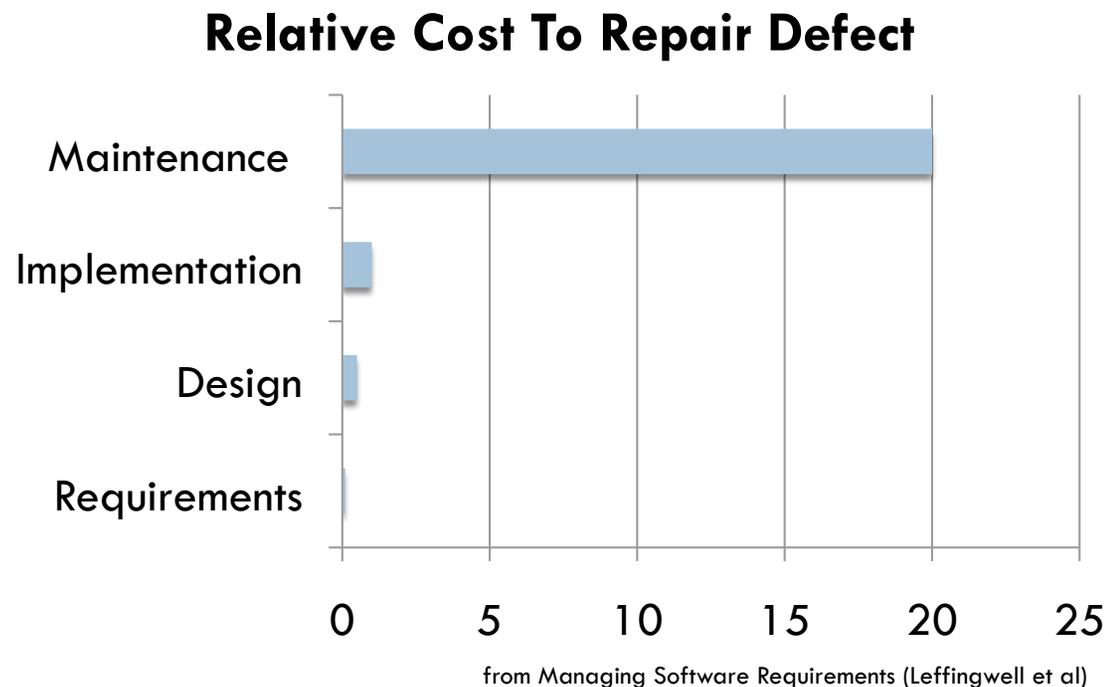
Coherent Design

- Design is a process from the beginning
- Ensure interaction flows for a user
- Especially important on a small-screen mobile device!



Building and Testing are Iterative

- Increasing fidelity with quick tests along the way
- From paper to working in the world
- Catch mistakes early when it's easy to change



Mobile Ecosystem

Web

- No installation
- Limited interaction with phone platform
- Rendering issues on different handsets
- Some reach to almost every device

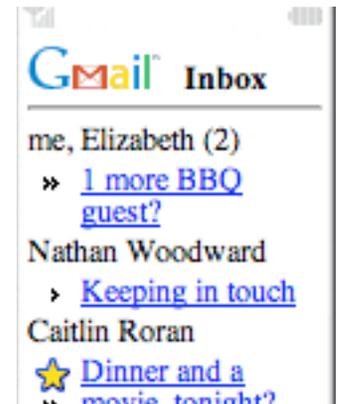
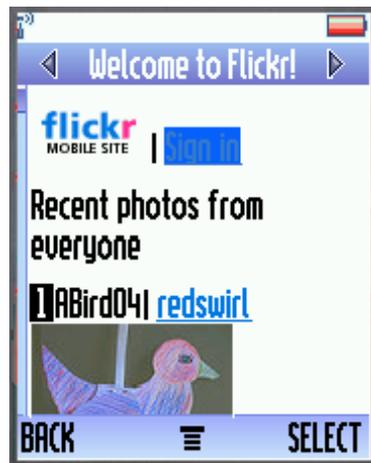
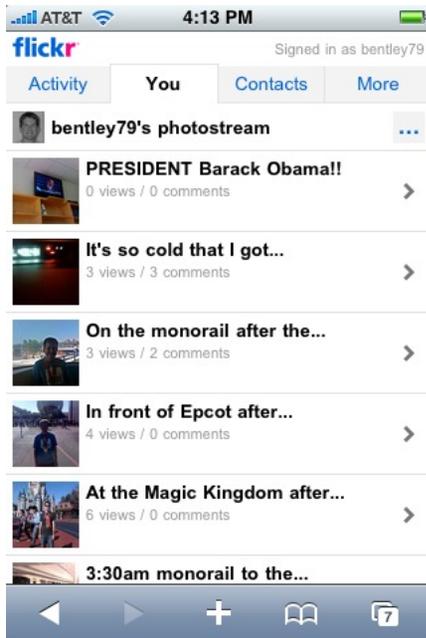
J2ME

- Works on most GSM devices
- More interaction with phone platform
- Consistent Look and Feel
- Lifecycle limitations

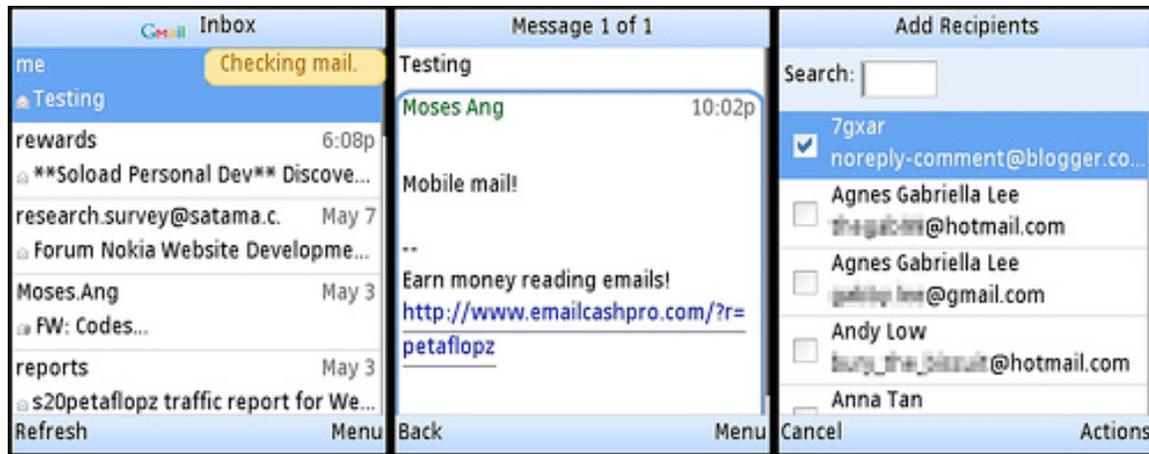
Native

- Written for a particular device
- Deepest interaction with phone platform
- More complex distribution/testing

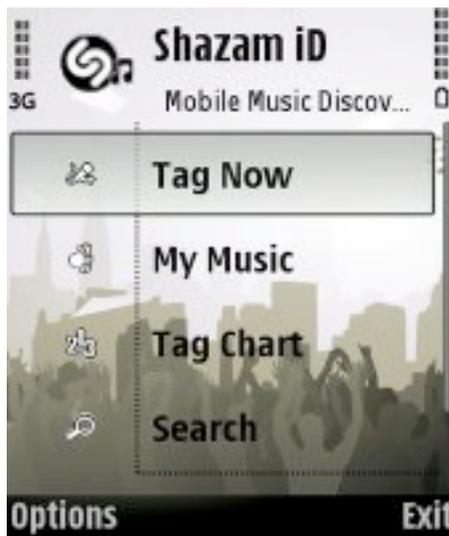
Mobile Web Applications



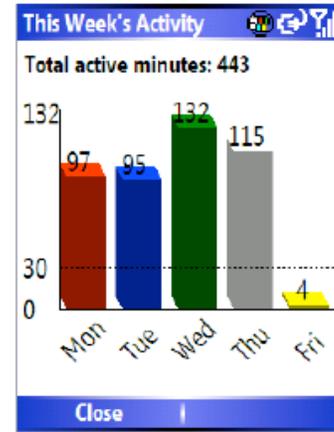
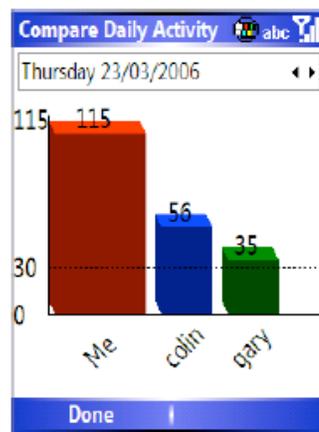
J2ME Applications



<http://www.flickr.com/photos/hasselblad/493225561/>



<http://2.bp.blogspot.com/>

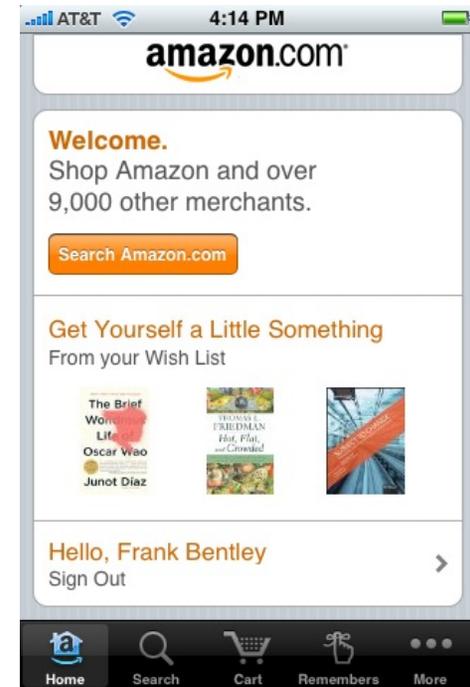


Shakra (Glasgow)



<http://operamini.com>

Native Applications



Current Mobile Research Areas



- Location-Based Mobile Computing
- Persuasive Applications
- Social Networking / Web 2.0
- Extending Experiences
- Enterprise

Location-Aware Computing

- How can location help make any mobile task more efficient?
 - Finding restaurants
 - Getting movie tickets
 - Knowing which bus to take
 - Tagging photos
 - Finding friends
 - Know where to sell their crops
 - Mobile tour guide/games



REXplorer

Mobile Persuasion

- How can mobile phones convince people to...
 - Eat healthy food
 - Work out
 - Use less energy
 - Help their friends and family
 - Volunteer
 - Be religious
 - Save the planet



Figure 1. UbiFit Garden's glanceable display. a) at the beginning of the week—small butterflies indicate recent goal attainments; the absence of flowers means no activity this week; b) a garden with workout variety; c) the display on a mobile phone—the large butterfly indicates this week's goal was met.

Social Networking / Web 2.0

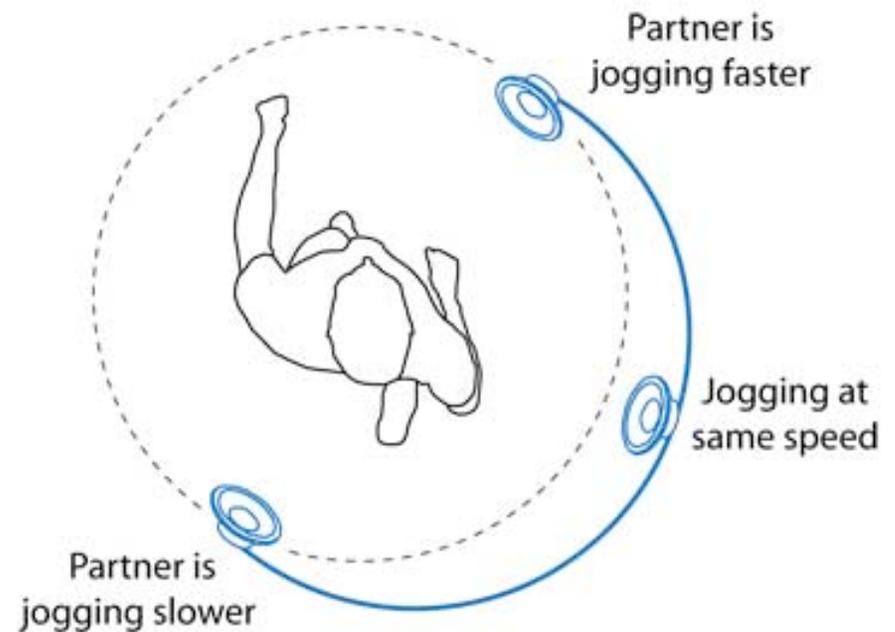
- How can phones link in data from online communities?
 - Status in contacts app
 - Micro-coordination (helping plan and meet up)
 - See photos from friends
 - Syncing online calendars
 - Selling goods/services
 - Managing group finances / microfinance



Yahoo! OneConnect

Extending Experiences

- How can an experience on a phone augment an in-person experience?
 - Sports – replays/stats on phone
 - Concerts/Festivals – see other people's photos/videos in real time
 - Working out – virtual workouts with others, nike+



Jogging the Distance

Enterprise

- How can mobile devices be used in a work context?
 - Routing people more efficiently
 - Getting additional information about products from web / checking inventory
 - Automatic check-in based on Bluetooth ID



RFID Reader



QR Code for Wikipedia

Next Steps



- Introduce yourselves, discuss mobile interests
- Fill out questionnaire

- For next week, observe and capture data in area of interest; more on that in a few minutes...

Semi-Structured Observation



- Goal: To develop understanding of area of interest
 - inspire design ideas for new applications
- Process: Observe people performing activities in your area of interest. If possible ask questions about their use.
- Write exact quotes or observations on post-it notes
 - a single idea to a note
- Try to capture ~50 notes

What to watch for...



- What do people enjoy...what part of a task makes them smile?
- Where do they get hung up/frustrated?
- What is currently easy/hard for them to do?
- How does their environment appear to play into their use?

How to ask questions...



- ❑ Don't ask people they usually do, how they would use/like a particular application/feature, or what they would do in a given situation
- ❑ Do ask about specific instances of use ("the last time" or "the time before that" work nicely)
- ❑ Do ask questions you have after observing someone, but wait until they are done with what they are doing
- ❑ Follow up when you want more information...keep them talking

Examples of notes...

- From a study on music use:
 - ▣ “Some of my CDs remind me of a time I had and I like to put it on and remember that time I had with it. Fall always gets me in the mood to play music I always listen to. Me and my sisters sitting on the porch and talking in our Nike sweatshirts. We used to play this song over and over when we went to her house”
 - ▣ “I often don’t like listening to the old stuff because...it sometimes takes me back to somewhere I don’t want to be...”
 - ▣ “She made this CD of music that related to them, she had this basket of CDs at the wedding and everyone took one and the bubbles...”
 - ▣ “Clock radio wakes me up as a routine every morning. I turn off my clock radio and turn on my stereo because it has better sound...”
 - ▣ Has CDs in a stack with no cases – sorts like playing cards

Questions?



- Additional questions, please email us
- Available throughout week electronically
- Can set up office hours/meetings with groups on Tuesday afternoons