Mobile Computing
Fall 2010 - 8/23/10
(L1)
- Intro to Class
- Overview of MC

[Diagram of various technology devices]

[Diagram of network connections: Wifi, Nixmax Cellular, 3G -> 4G]
Context-Awareness + Humane Interface + Sensors - Location GPS - Motion - Environmental

Smart Apps!
Challenges:
- Pervasive Connectivity
- Energy Efficiency
- Security/Privacy
- Affordability

Innovation
- Multitouch Screen
  - Jeff Han’s Ted video
- Touch Screen
Building Background Knowledge

Lecture + Textbook
HW + Exam
30%

Discover State of the Art
Present Articles + Presentation
20%

Applying Innovation
Analysis
Dev.
Term Proj.
40%

10% for Self-directed Presentation & Participation in Class
Touch Screen- How it works:

3 Components

1. Touch Sensor (Panel)
   - touch charges
   - voltage/current

2. Controller:
   - small PC card
   - connect TS to PC
   - translates touch
   - info to PC

3. S/w Drivers (mouse
   - emulation type)
(Ref: How does Jocul scrum work - inventors.about.com)
Discussion on Multi-touch

Intuitive Interfaces

Conforming Intergaces to Humans

Co-evolved with Tech
- Make new creative app (unused)
- Company/memory can be used to support new apps.

Battery is the Achilles' heel!
Comp. eff = \frac{Perf.}{Joules}

Find out how comp. eff is evolving (progress)
Mobile Computing

Small Scale

Large Scale

Button click

Show "on"

Start

on

off

If on?
Create button "off"

If off?
Create button "on"
Project Topics

Introduction to Wireless

Reading - Chapter 1 + Appendix

Introduction to Mobile Camp

Programming Assignment

George Green

Topics/Agenda

L2: Aug 25 + 26 10
1. Select an Application Area
2. Traditionally, metric quality
3. Green Computing
4. Healthcare
5. Latency Efficiency
6. Energy Efficiency

Recipe to Select Project
- Or - Of
- The under score thing

4. Find and read parts

- Sensitive - Auditory, Thymid.
- Communication - M.T. Bluelock.
- Company: Smart Phone

3. Select a set of the
(at least one from each) Company, Sensitive, Communication.

- All
5. Identify a specific topic at the intersection of App+Quality+Platform Metric.

6. Do a more refined literature survey to identify a
well defined problem to work on.

7. Do the work!
Agenda:

1. Basics of Wireless/Mobile networking (App A)
2. Mobile Adaptive Computing (Ch 1)
3. Project Group Formation
- Sixth Sense:
  ex. of human
  interfaced mobile
  application
  - see video al-
ted.com

- Research paper for
  reading:
  1. Agile Application
      Aware Adaptation
         for Mobility
         Noble et al.
         SIGOPS 97.
2. guFile: the right file at the right time
   Veeraraghavan et al.
   FAST '10
   Best Paper Award

3. Intentional Networking:
   Opportunistic Exploitation of Mobile Network Diversity
   Higgins et al.
   MobiCom '10
Research skill:
- How to quickly figure out how important an article is in a field?
- old: Scholar. Google.com
- new: Where it is published; list provided on class website.
- How to find related recent articles
  - Look at the citation list of the paper
  - Scan for papers in good publication venues.
Sixth Sense Video

- intuitive interface
- phy obj → cyber digital world

manipulation
using gestures

⇝ using phy world as interface
- intuitive workflow
- Many projects possible
- Open source
- Affordability
Agenda:
- Mobil Adaptive Computing (Cont.)
- Intro. Wireless Sensor Networking
- Prog. Ass. 2
  - Data collection using Telos B Mote
CODA
File system for mobile

- Good env.
- Poor connectivity

M.C.
A program accessing files

File server
How to ensure that m/c is able to continue executing programs despite connectivity state?

- Description of CODA approach as a state m/c. **(Fig 1.3 in book)**
Code system architecture

Extended CS model

Lot

Client

Server

where client sometimes act as the server

(See Sec. 1.3.1 of book)
Single proxy model:

Proxy

Dual proxy model

Proxy caching

Can collaborate to reduce protocol overhead (see pg 17, WebEx)
Transcoding Proxy

Computing Transcoding Threshold (Proxies on Pg 14)

req. \rightarrow o

1st bit of fmpmk-S

RTT : Round trip delay

\text{RTT}_{cp} + \text{RTT}_{isp} = \text{RTT}_{cs}
Paper Reading Assignment:
Write a 1 page summary on each of the two papers: gufile & Intent.
Focus on adaptive schemes used in these papers. A state-based description of their adaptation scheme (akin to Fig 1.2 in book for ODA) is desirable. Due 9/8/10