CS 525M – Mobile and Ubiquitous Computing Seminar

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Systems issues

- 3 papers:
  - PowerScope
  - CODA
  - Software power saving techniques
- Today, I will talk at the end about projects

Projects

- Timeline/deadlines already discussed
- Today, more details handed out about project proposal
- Today, just talk a little about how to proceed/ideas
- Some thoughts
  - Easiest to start with a paper you read that you like
  - 2 quotes:
    - 6 billion people in the world: lots of people
    - Donald Knuth, building on the shoulders of other giants
  - Find out related work/up-to-date stuff on it
  - Get good picture of what's been done/not done
  - Since this is a class, can focus on reproducing results of recent variant

A few ideas

- Idea 1: design a WPI enhanced with sensors, ubiquitous computing elements
  - Give nice overview, design, issues, etc
  - Search for free or off-the-shelf tools which you can use for your work e.g. IM, sensors, cameras, etc
  - Update your design using these tools and how you would use them (clear separation between design and implementation)
  - Choose a subset of your design to prototype
- Week 10 paper on context-aware applications in hospital may help

Ideas

- Idea 2: Set up powerscope
  - Profile other applications/workloads
  - E.g. compare energy usage of real player, quicktime, etc
  - Study battery models: predict battery life (spikes, etc)
  - Consider software-only solution of powerscope (i.e. no multimeter, no oscilloscope, etc).
    - Windows already has some energy-related calls
    - Investigate, study academic models
    - Hack!!!
- Some papers also show how to measure energy usage of network card
- Week 12 paper talks about how to and tools for hacking existing wireless LANs
  - Set up these hacks and then measure power usage

Ideas

- CODA paper carefully assumes non-collaborative applications (less than 1% of files shared)
  - All hell could break loose with heavy sharing of collaborative applications
  - Download CODA, set it up, consider collaborative applications
- Simulate 3 different TCP variants
  - E.g. TCP Westwood, week 6
  - Compare their energy consumption
  - **Note:** latest version of NS set up on CS machines
- Broadcast disk paper assumes cute theoretical access patterns with noise
  - Use available traces of data access to stress test broadcast disk

Conclusions

- You should feel comfortable coming up with a wild idea and researching it
- I will write up some of these sample projects and more ideas to help you out
- Important: do something you'll enjoy, good at