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