Administrative Chores

- Add yourself to the ubicomp@listserv.uga.edu mailing list

http://listserv.uga.edu/archives/ubicomp.html

- Create your entry for the online critique system

http://greenhouse.cs.uga.edu/~surendar/teach/spr01/Ubiq/edit-member.pl

Outline for today

Course project

How to read a research paper?

How to write a research paper?

Course Project

- Goal:
  - Tackle significant, interesting problem in the area of mobile/distributed/ubiquitous computing. Talk to me about any interesting ideas.

- **Aim Big**, it is important to explore an interesting idea than to have a completely working simple prototype.

- Course project and the comprehensive oral exam carry a significant portion of the course grade

Milestones

Week 1
01/16/2001

Group Introduction

Each student will submit their name, email address, and two or three areas of interest for a term project by email. This list will be distributed to the entire class. The goal is to match students with similar interests and form project teams.

Students who have already formed teams make a single submission with all names and their area(s) of interest.

Milestones

Week 3:
01/30/2001

Group formation

All groups should be formed. Each group submits the names of their group members along with a narrowed area of interest.

Groups begin thinking about their projects. I will provide a list of suggestions that can be used as a starting point.

All groups are encouraged to consult with me, ask questions, etc. in preparing their project topic for the next milestone.

Milestones

Week 7:
02/27/2001

Project proposal

- a description of your topic
- crisp statement of your hypothesis
- a statement of why the topic is important
- a description of the methods you will use to evaluate your ideas
- references to at least three papers you have obtained with a summary of how they relate to your work.

• Proposals should not exceed 2 pages in length

• Shortly after submission of the proposal, each group will meet with me to refine the project topic.

Milestones

Week 10:
03/20/2001

Project checkpoint

In two pages or less, summarize your progress.

- Describe any initial results.

- Describe any changes in your project's scope or direction now that you know more about the topic.

- List the major milestones you have completed and the milestones that you must complete to successfully finish your study.

- Each group will again meet with me to discuss their progress and goals.

Milestones

Week 13:
04/10/2001

Public mini conference

The student groups will present their experiences with the research project in this symposium. This symposium will be open. Students will provide feedback on the different project presentations.

Best presentation awards will be selected from these feedbacks.

Milestones

Written reports:

You will submit a 10 page research report. **Best paper** awards will be selected from these reports**.** Promising papers will be submitted to research conferences.

Milestones

Week 15: 04/24/2001

Comprehensive individual oral interviews

How to Read a Research Paper

- Typical paper
  - Abstract
  - Introduction
  - Motivation, problem description
  - Research questions that are being addressed by this paper
  - Experiment Setup
  - Results
  - Conclusions and Future work

Why do you read a paper?

- Understand and learn new contributions

- However
  - Not all papers are "good"
  - Not all papers are "interesting"
  - Not all papers are "worthwhile" for you

- You have to learn to identify a good paper and spend your time wisely
  1. Breadth
  2. Depth
  3. React

How to Read a Research Paper

- Ask yourself, what is this paper about? (breadth)
  - Read the title and the abstract

    If you still don't know what this paper is about, then this is a bad paper.

  - Read the conclusion

    Are you now sure you know what this paper is about? If not it is a BAD paper. We will try not to read such papers in this course

- Read the introduction
- Read the section headings
- Read tables and graphs and captions. See what they say

How to read a paper (cont)

- See who wrote it, where it was published, when was it written (credibility)

- Skim bibliography to see if the authors are aware of relevant related work. See if you know the relevant work. See if you know a relevant work that they didn't refer

How to read a paper - depth

- Approach with scientific skepticism
- Examine the assumptions
  - Do their results rely on any assumptions about trends in environments?
  - Are these assumptions reasonable?
    - E.g. "Lets assume that there are billions of powerful computers, connected by a high speed network, spread across the world, our system will …"
    - E.g. "Our system can enable you to run Windows 98 on a 33Mhz Intel 386 with 640K main memory"

How to read a paper - depth

- Examine the methods:
  - Did they measure what they claim?

  - Can they explain what they observed?
    - It is easy to dump your experimental results on the paper. As a reader you want an analysis of why the system behaves a certain way, not the raw data.

  - Did they have adequate controls

  - Were tests carried out in a standard way? Were the performance metrics standard? If not, do they explain their metrics clearly?

How to read a paper - depth

- Examine the statistics: (there is truth, lies and then there is statistics!!)
  - Were appropriate statistical tests applied properly?
  - Did they do proper error analysis?
  - Are the results statistically significant?
    - Common mistake: "We performed our experiment once at 4 am and noticed a ten fold improvement. Thus we conclude that our system is better"
  - Be very careful with percentages
    - Method A: 0.01 seconds, our Method: 0.005 seconds
    - Our method shows 100% improvement over method A!!

How to read a paper - depth

- Examine the conclusions:
  - Do the conclusions follow logically from the conclusions
    - We performed our experiments with 8 palm pilots and saw a 10 fold improvement. Hence we conclude that our system will scale to millions of palm pilots

  - What other explanations are there for the observed effects
  - What other conclusions or correlations are there in the data that they did not point out
    - Earlier work performed experiments using a 2 Mbit wireless network. Our system (incidentally) used a 11 Mbit network and saw a 5 fold improvement. So our technique works!!

How to read a paper - react

- ## Take notes
- ## Highlight major points
- ## React to the points in the paper
  - Place this work with your own experience
  - If you doubt a statement, note your objection
  - If you find a pleasing quotation, write it down
- ## Construct your own example
- ## Summarize what you read

- ## Maintain your own bibliography of all papers that you ever read

Sample bibliography - bibtex

```
@Book{stevens98,
        author = {W. Richard Stevens},
        title = {UNIX Network Programming:
                Networking APIs: Sockets and XTI},
        publisher = {Prentice Hall},
        year = 1998,
        volume = 1,
        series = {ISBN 0-13-490012-X},
      note = {Sample code from this book is available at
                \url{http://www.kohala.com/start/unpv12e.html}},
        edition = 2,
}
```

….. You can refer to the Computer Network books by W. Richard Stevens
   \cite{stevens98} for sample ….

How to Write a Research Paper

- Write it such that anyone who reads it using the method we discussed understands your ideas.

- Clearly explain what problem you are solving, why it is interesting and how your solution solves this interesting problem

- Be crisp. Explain what your contributions are, what your ideas are and what are others' ideas