Introduction

CS 2001: Research Topics in Computer Science
Fall 2013

Dietrich School of Arts of and Sciences
Department of Computer Science
Administrivia

Research Topics in Computer Science

- CS 2001
- TU/TH 1:00 - 2:15PM, F ? - ? (rarely)
- 6516 Sennott Square

Instructor

- Professor Adam J. Lee
- adamlee@cs.pitt.edu
- 6111 Sennott Square
- Office Hours: If my door is open

Email me your Friday schedules so that we can pick a reserved make-up time

http://www.cs.pitt.edu/~adamlee/courses/cs2001
So how is this course scheduled anyway?

Two distinct sections...

Part I:
- What is research?
- How do I understand research?
- How do I evaluate the research of others?
- How do I do my own research?
- How can I communicate my exciting new results to others?

The goal here is to prepare you for success in our program

Part II:
The goal of the first part of the course is to prepare you to do research

- How to read and understand
- How to critique
- How to write

Tools of the trade...
- University computing environment
- Statistical processing
- Scripting and plotting
- Paper writing

Communication
- What makes a good talk?
- What makes a bad talk?
- Advertisements vs. book reports

Research papers
- How to read and understand
- How to critique
- How to write*
Goals for today...

1. Quick introductions to one another
2. What is a PhD?
3. Why do a PhD?
4. Getting a PhD at Pitt
Who are you guys?

Let’s get to know one another...

- Your name
- Why Pitt?
- Research interests
- Anything else?

“I have no idea…” is a perfectly fine answer!
What is a PhD?
What is a PhD?
What is a PhD?

Borrowed from http://matt.might.net
What is a PhD?
What is a PhD?
What is a PhD?

Borrowed from http://matt.might.net
What is a PhD?

Borrowed from http://matt.might.net
What is a PhD?

Borrowed from http://matt.might.net
What is a PhD?
What is a PhD?

Keep Pushing.

Borrowed from http://matt.might.net
So... What *is* a PhD?

A PhD is a process!

A demoralizing process at times...
- So much has been done already, how do I keep up?
- What *new* problem should I be solving?
- Solving this problem is *way harder* than I thought it would be...
- Why doesn’t my code (or code that I’ve borrowed) work?!
- Why do my papers keep getting rejected?

But a process that will educate you greatly
- Problem identification and solving
- Persistence and hard work
- Clear (written and spoken) communication skills
- Team work, management, and mentoring
So why would anyone do a PhD?
The (Abridged) PhD Timeline at Pitt

- **CS 2001**: Pass Prelims
  - Coursework only
  - 4 Classes, A- or better
  - CS 2100 - 2899 only
  - Can count towards core reqs

- **CS 2002**: Find an advisor!

- **Comprehensive Exam**: Pass core requirements
  - One course from each of
    - AI / Database
    - OS / Networks
    - Architecture / Compilers
    - Theory / Algorithms
  - At least a B in each

- **Dissertation Proposal**: Demonstrate depth of knowledge
  - Very basic gist of PhD topic area
  - Committee: 3 CS faculty
  - Ideally done by end of year 3

- **Defense**: The big show...
  - At least 8 months after proposal

http://www.cs.pitt.edu/grad/regulations_pages.php
Tips for Success

- Work hard to finish course requirements
- Identify research areas/professors of interest
- Begin reading papers & discussing area
Tips for making the most of meetings...

When reading/experimenting:
- Take notes on the papers
- Write down questions and interesting problems
- Write up preliminary results

During the meeting:
- Take notes!
- Ask questions: It’s OK to be confused
- Agree on next steps, desirable outcomes

After a meeting:
- Reflect on meeting “minutes”
- Develop a plan for meeting expectations
- Pop-in or exchange email to address small problems between meetings
Tips for Success

- Work hard to finish course requirements
- Identify research areas/professors of interest
- Begin reading papers & discussing area

- Attend group meetings
- Read several papers per week
- Research! Develop your niche.
- Work on time management skills
How do I choose an advisor?!

Key points: research interest and fit

You are unlikely to finish a PhD that you aren’t interested in...
- Use CS2001 to get to know faculty whose work seems interesting
- Take courses and seminars in these areas
- Read papers, make sure you’re interested in recent developments

You will be working very closely with your advisor
- Do you prefer “hands on” or “hands off” advising?
- Can you take direction/criticism from this person?
- Use CS2002 and course projects to test fit!

Choosing an advisor is a big decision...
Tips for Success

1. Work hard to finish course requirements
2. Identify research areas/professors of interest
3. Begin reading papers & discussing area

• More than smarts: Persistence!
• Time management should become an art...
• Identify larger open problem, not just many small “neat” problems
• writing, Writing, WRITING

4. Attend group meetings
5. Read several papers per week
6. Research! Develop your niche.
7. Work on time management skills

• Good thesis or great thesis?
• To defend, you must be an expert. Are you?
• Resist the temptation to take a job before you defend. This is a recipe for disaster.
Welcome to the program!