

Research Methods in computer science

Fall 2015

Lecture 1

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Objective

Learn how research is done
in computer science

Improve research
productivity

Topics Covered

Papers: Read, write, evaluate

Presentations: create, perform, evaluate

Other topics

- Research thinking

- Graphs and visualization

- Tools

- Statistics and data analysis

- Experiment design

Guest Lectures

Other faculty and experts in research, writing, presentation will come to the class to share their ideas.

Important to understand different views and emphasis. They may be your co-advisor, peers, or thesis committee member.

Who Should Take this Course?

Ph.D. Students in early career

MS Thesis students

Administrative Information

3 credits

Can use this course in place of 6110

File a petition requesting substitution

Meet Mondays/Wednesdays at H34

Office hours Mondays 230-330pm

<http://www2.cs.uh.edu/~gnawali/courses/cosc6321-f15/>

Grading

Pass/Fail

To Pass

Submit all homeworks

Each homework graded 0 or 1

Average grade must be > 0.75

Participate in activities (conference, etc.)

Topics for today

PhD and Research

What skills do we need to be successful?

The concept of deliberate practice

PhD

Courses?

Research?

Networking and other activities?

Research

Research comprises "creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humans, culture and society, and the use of this stock of knowledge to devise new applications." It is used to establish or confirm facts, reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories.

<https://en.wikipedia.org/wiki/Research>

Some research is theoretical and involves developing and analyzing new algorithms and techniques and some is more applied and involves experiments, design, implementation, and testing. In every case, research is an enterprise of intellectual exploration that seeks to advance our field.

<http://conquer.cra.org/students/what-is-research-in-computer-science>

Skills

What skills do we need to do research?

How to create knowledge?

(Practical) How to produce output such as:
paper/presentations/software?

Deliberate Practice

Observe

- Find good papers and presentations

- Study the content and style

Identify Skills

- Compare with your habits/skills/outputs

- Details (not high level like “writing”)

Practice

- Drills to challenge and improve

- Iterate with feedback

Assignment 1

Write two paragraphs (no more than half page) on a computer science topic you find interesting. Also explain why you find it interesting.