EECS 573 Class Overview

Prof. Todd Austin

Fall 2019

Course Organization

- Lectures
  - Cover three important areas of computer architecture: reliability, security, and application-specific design
  - Additional lectures expand on all aspects of research
- Student (team) presentations
  - Students (teams of two) present recent research papers
  - Papers are picked from a recent publications (see website)
- Midterm exam, late in the semester
- NO final exam
- Semester-long research project, due at the end of course
- Class website: http://www.eecs.umich.edu/courses/eecs573

Semester-Long Research Project

- Open ended, research paper quality project
  - Project ideas will be offered by instructor, or come up with your own idea to pursue (if approved by instructor)

- Team projects. Teams of size 2-4

- Deliverables:
  - Project proposal meeting and write-up: goals, milestones, evaluations
  - One checkpoint review meeting, with one-page status write-up
  - Final presentation in class at end of semester
  - Project report and sources due by the end of semester

Exams and Class Participation

- Only one midterm exam, late in the semester
- No final exam

- Class participation
  - Students must be prepared to discuss the research papers presented in class
  - Active participation during lecture is a requirement

What Is Expected From You and How It Weighs

- Class participation (10%)
- Class presentations (20%)
- Midterm (30%)
- Semester-long team project (40%)

- Grading policy: class is not adversely curved, if you do well in the course, you will get a good grade

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What is Research?

The Zen of Research

- ## What is research?
  - Difficult question… What is not research?
  - My definition: Teach your advisor something new, important and insightful
  - Often your research goals will differ from professors/advisors/employers

- ## What you should do
  - Read, read, read recent research papers
  - Discuss ideas with your fellow students and professors
    - Important to be in the department much of the time
  - Define a thesis research direction to pursue
    - A PhD places the burden of originality on you
  - Don't forget that your advisor/professor is a really busy person
  - Show constructive initiative
  - Work hard to express your ideas clearly and concisely in writing and in meetings with your advisor, professors and your colleagues
    - This is the most important skill you can learn here…

The Zen of Research

- What you should NOT do
  - Expect to change the world with your early work (it's unlikely)
  - Avoid failure and rejection
  - Reinvent yourself by working on research that doesn't leverage core strengths
  - Be perfect… it's too expensive!
  - Be afraid… it's too slow and ineffective!

- What your advisor/professor will do
  - Help find a topic
  - Provide constructive criticism as you develop a thesis topic
  - Assess what or your ideas is likely to lead to a fruitful line of research
  - Support your case in prelims/qualifiers, etc.
  - Work to find support for your work, e.g., GSRA or Fellowship
  - Help get a job after graduation (recommendations, connections, etc.).

The Zen of Research

- Getting GSRAs & Fellowships
  - Do good work and be visible – faculty will rush to employ you

- An advisor's biggest anxieties
  - Underperforming GSRAs
  - Achieving graduate students that they are unable to support
    - When is it fair to switch the funding form one to the other?
  - GSRAs with no initiative that need micromanaging

- Other chores for GSRA's – why it's called an "assistantship"
  - Help building tools
  - Help with managing infrastructure (e.g., simpool)
  - Help reviewing papers
  - Help with proposal writing

How to give a bad talk

The Ten Commandments
by David A. Patterson

1. Thou shalt not waste space

- Transparencies and hard-discs are expensive.
- If you can save five slides in each talks per year, you save 7.00/year in transparencies!
- This is equivalent to 350 kB precious memory!

- 2. Thou shalt not be neat

- 3. Thou shalt not covet brevity

- Do you want to continue the stereotype that engineers can't write? Always use complete sentences, never just key words. If possible, use whole paragraphs and read every word.

- 4. Thou shalt cover thy naked slides

- You need the suspense! Overlays are too flashy.

- 5. Thou shalt not write large

- Be humble -- use a small font. Important people sit in front. Who cares about the riff-raff?

- 6. Thou shalt not use color

- Flagrant use of color indicates uncareful research. It's also unfair to emphasize some words over others.

- 7. Thou shalt not illustrate

- Confucius says ``A picture = 10K words,'' but Dijkstra says ``Pictures are for weak minds.'' Who are you going to believe? Wisdom from the ages or the person who first counted goto's?

- 8. Thou shalt not make eye contact

- You should avert eyes to show respect. Blocking screen can also add mystery.

- 9. Thou shalt not skip slides in a long talk

- You prepared the slides; people came for your whole talk; so just talk faster. Skip your summary and conclusions if necessary.

- 10. Thou shalt not practice

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- Ignore spell'g, grammer and legibility.

Who cares what 30 people think?

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- Why waste research time on preparing slides?
- Ignore spelling, grammar and legibility.

Who cares what 30 people think?

3. Thou shalt not covet brevity

- Do you want to continue the stereotype that statisticans can't write? Always use complete sentences, never just key words. If possible, use whole paragraphs and read every word. This way you will ensure that your audience gets the full extent and nuance of your work – trust me!

3. Thou shalt not covet brevity

- Use key words.
- Don't read your slide.

4. Thou shalt animate to the limit

- You need the suspense!

Overlays are too flashy
Animations can irritate.

5. Thou shalt not write large

- Be humble -- use a small font…
- …especially for the relevant part.
- Important people sit in the front.

6. Thou shalt not use color

- Flagrant use of color indicates uncareful research.
- It's also unfair to emphasize some words over others.

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  - ``A picture is a 1000 words,"
- but Dijkstra says
  - ``Pictures are for weak minds.``

- Who are you going to believe?

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- You should avert eyes to show respect.
- Blocking screen can also add mystery.

9. Thou shalt not skip slides in a long talk

- You prepared the slides and suffered, make them suffer too.
- People came for your whole talk; don't cheat them out of anything.
- So just talk faster
- Skip your summary and conclusions if necessary.

10. Thou shalt not practice

- Why waste research time practicing a talk?
  - It could take several hours out of your two years of research.
  - How can you appear spontaneous if you practice?

- If you do practice, argue with any suggestions you get and make sure your talk is longer than the time you have to present it.

- Commandment 10 is most important. Even if you break the other nine, this one can save you.

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Prof. Austin's Distilled Watchlist:

1. Limit amount and rate of information delivery

2. Polish and practice makes work likeable

3. Respect and engage your audience

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EECS 573 Presentations

EECS 573 Presentation Structure

- This is a structure that works well in my experience and it is the most common at conference presentations, however, other structures may work as well.
  - Motivation
  - Goal
  - Solution - technical overview
  - Experimental evaluation
  - Technical insights
  - Conclusion
  - Discussion points

Presenters: How to Prepare

- *(10 days before)*
  - Study the paper
  - Make sure you understand it
  - Make sure you understand the problem that the paper addresses.
    You may need to do some research to understand the problem/context better.
  - Read referenced work if the paper relies heavily on it
- *(1 week before)*
  Prepare your slides
  - Limit amount of text in a slide
  - Pictures are always faster at conveying ideas
    (feel free to copy pictures from the paper)
  - Follow the structure above (Presentation structure)
  - Have no more than 10-13 slides
- *(3-4 days before)*
  - Rehearse
  - Rehearse again
- *(1 class period before)*
  - Presenters meets with instructor ***(REQUIRED, NO EXCEPTIONS)***
  - Rehearse
- *(day of the presentation)*
  - Present

Class Checklist

- You have 20 minutes for your presentation + 10 minutes for the discussion. After 30 minutes I must stop the discussion to move on to the next paper or lecture

- The presenter meeting with the instructor should be scheduled *in office hours* or *after class* on the day of the lecture preceding your presentation (If the slides are not drafted by the time of the team meeting with the instructor, the presentation may be pulled from the schedule)

- During the presentation, **each team member must present a quantity of slides that is within *two* of the other team member**

- Figure/Table Reuse Policy: You may use figures and tables from the paper (or the author's presentation) as long as they are cited on your slide. No text/bullets may be reused from any source. Note that excessive use of cited material will result in a lower presentation score and use of uncited slide materials will result in a severe presentation score penalty

- Responsibilities of the audience
  - Read the papers in advance
  - Be an engaging audience, comment on the material and ask questions
  - Be prepared for a *two-team* question and answer session after the talk