CS 3205 – HCI in Software Development

Course Introduction

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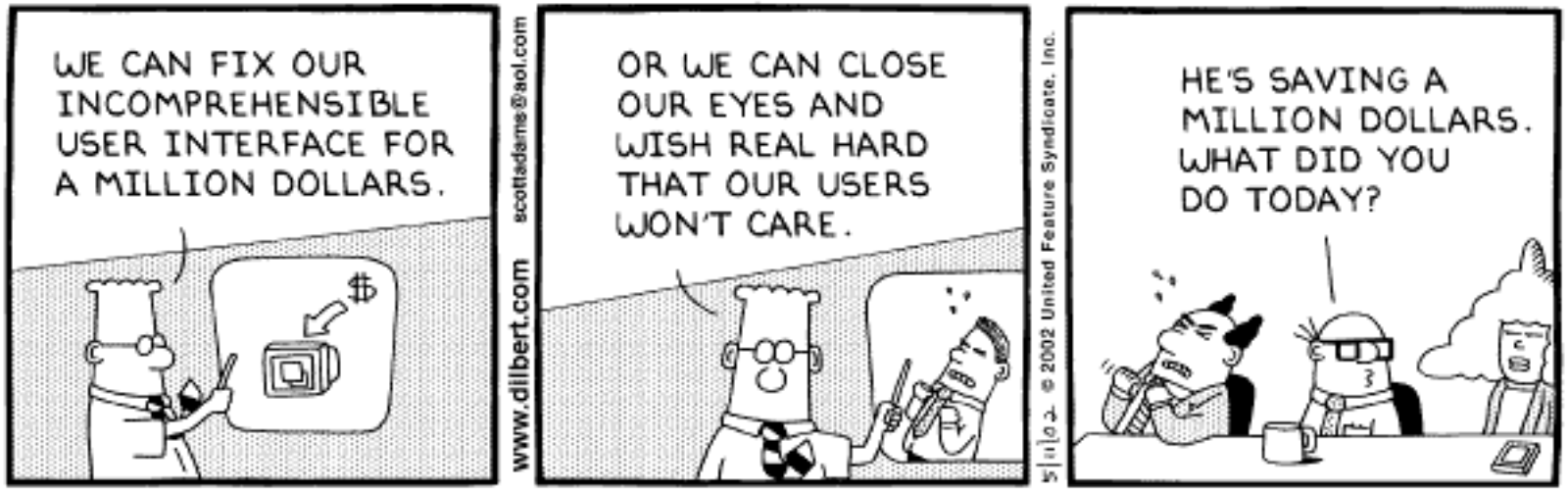
This topic matters because…

- There's a Dilbert cartoon about it!



What's the Course About?

- In one sentence:
  - Human-computer interaction (HCI) and user-centered design in the context of SW engineering
- Note the target audience:

  Students who may be involved in SW development
  - HCI is important to others: HW designers and engineers, Web designers, psychologists, etc.
  - But CS3205 targets SW development

What is HCI?

- Human-Computer interface
  - Where people “meet” or come together with machines or computer-based systems
  - Physical interface (e.g. buttons, screens, menus, etc.)
  - Logical interface
    - The model a system presents a user
    - Set of tasks available and how they’re organized

From the SIGCHI Website

- HCI is…
  - An inter-disciplinary discipline (engineering, CS, psychology, graphic design, ergonomics, etc.)
  - Concerned with design, evaluation, and implementation
  - Addresses people's needs, capabilities, limitations

SIGCHI curriculum definition site

Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.

Wikipedia definition

Human–computer interaction (**HCI**) involves the study, planning, and design of the interaction between people (users) and computers. It is often regarded as the intersection of computer science, behavioral sciences, design and several other fields of study.

"Flavor" of our HCI course

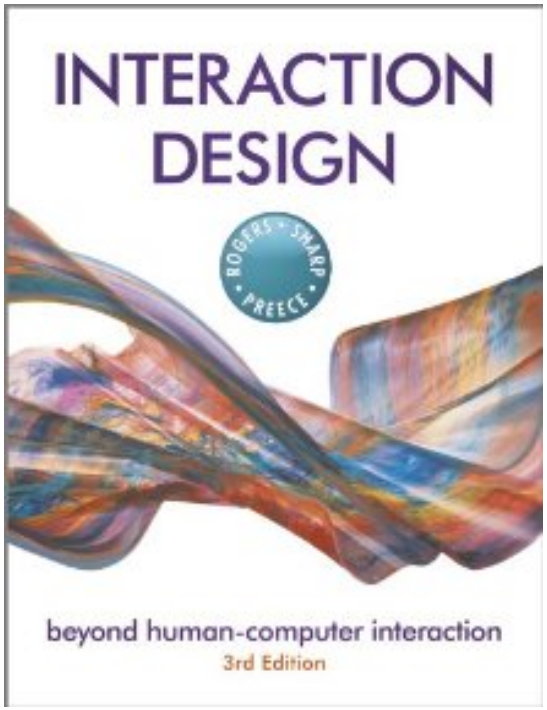
- My CS 3205 focuses primarily on the engineering aspects of HCI.
  - User/Task Analysis, Prototyping, Empirical Evaluations, etc…
- Don't Worry Though!
  - We WILL pay respect to the design, psychological, and sociological aspects of HCI.

Course Mechanics

- Waitlist news
- Course website: http://www.cs.virginia.edu/~horton/cs3205
- Collab site: you can reach website from Collab
  - We'll use some features of Collab.
  - But won't be our main website this term
- (Review of syllabus)
  - Pre-requisite: CS 2110!
  - Course description
  - Course goals

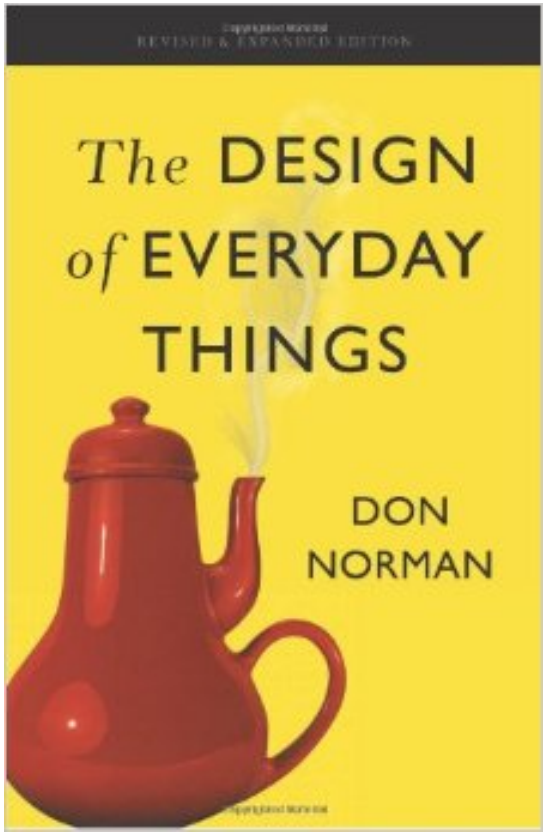
Textbook!

- *Interaction Design: beyond human-computer interaction (ID book)*, by Rogers, Sharp, Preece)
  - 3rd edition



Supplemental Text

- *Design of Everyday Things (DOET)*, by Don Norman



Outline of Topics in Course

- ***Unit 1: Introduction***
  - Overview of HCI, interaction design (ID), user-centered development. Some history of HCI.
- ***Unit 2: The Process of Interaction Design***
  - Overview of process. Relation to SE Process. Life-cycle models.
- ***Unit 3: Quick Iteration Covering the Full Process***
  - Quick tour of users, tasks, evaluation
- ***Unit 4: Interfaces and Interactions***
- ***Unit 5: Users, Needs, Requirements***
- ***Unit 6: Design, Prototyping. Physical UI Design***
- ***Unit 7: Evaluation***

What Makes Up Your Grade?

- Exams: 45%
- Project Group-work: 35%
- Homeworks: 17%
  - includes Project Part 1, which is individual
- Course Karma Points: 3%

- See syllabus for more details

Project

- For a proposed idea for a SW application, you'll
  - Carry out HCI analysis, design, and evaluation activities and document them
  - No implementation of the application!
  - But prototypes of the user-interface
- What HCI activities exactly?
  - Analyze user types and characteristics, tasks, context of use, etc.
  - Define conceptual models of the interface, low-fidelity prototypes, probably one high-fidelity prototype
  - Usie prototypes to evaluate usability characteristics of your ideas, with "real" users

Project

- Teams of 3
  - Preference given for topic, team members.
- Deliverables
  - Three parts of the project to be completed.
  - The 3rd part turned in as part of complete report containing all parts
  - A 25-35 page technical report, well-formatted. (One per group.)
    - Hopefully a nice writing sample or example work for a portfolio or the like

Other Assignments: Homeworks

- Project Part 1: proposal, individual
- Homework 1:
  - Individual. Simple measures and evaluation of a common app or website.
- Homework 2:
  - Wall of Shame! (competition)
- Homework 3:
  - Student choice! Find something that excites you
    - Or we'll have some straightforward choices
    - Gadgets? We've got some!

Wall of Shame

- For your enjoyment (or horror), here is the current reigning champion from past Wall of Shames.
  - The creators took it down, but not before we made a copy!
  - http://www.cs.virginia.edu/~horton/cs3205/info/brinascatch.com/Home.html
- Homework 2 will let you work in pairs
  - Will have a group/competition aspect, too!

Homework 3:

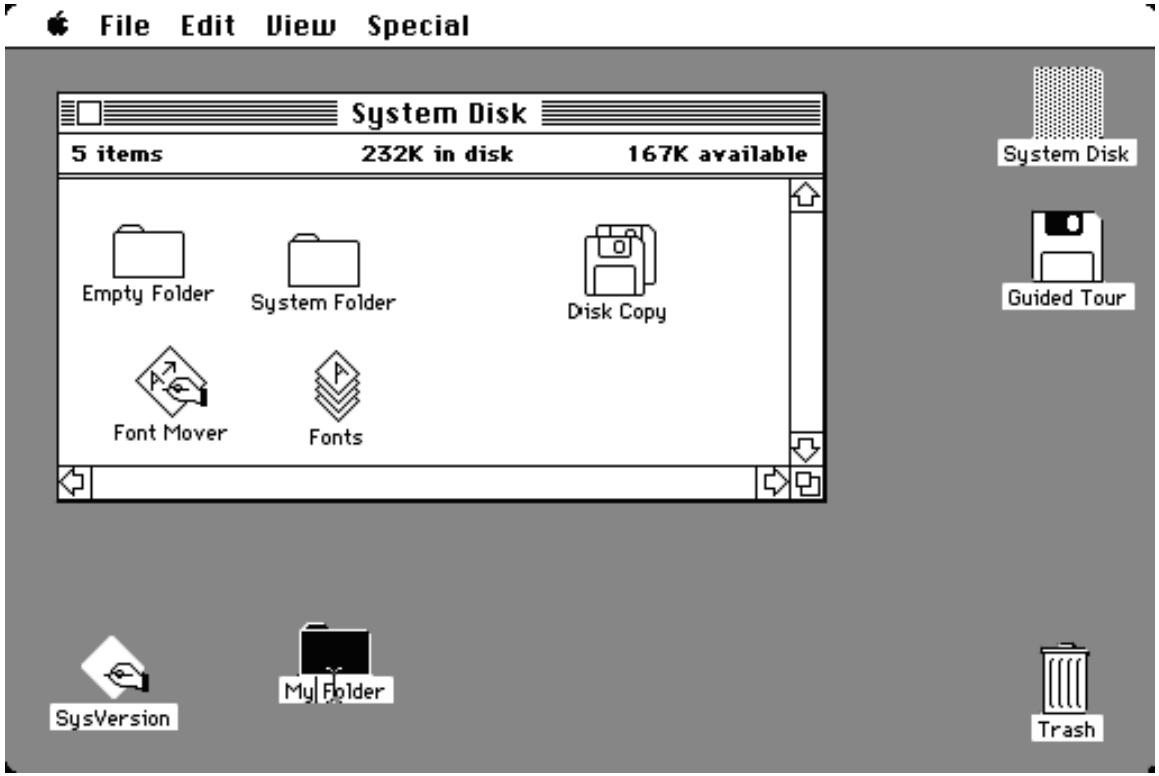
- Note: due at end of term, after the project! Worth 7% of final grade.
- Examples ideas:
  - Build a GUI based on UI design patterns, good principles, etc.
  - Focus on particular user types: children, elderly, accessibility
  - UI evaluation of similar apps
  - Development and exploration with "gadgets"
    - See next slide
  - Research paper summaries

Some Common Questions (& Answers)

- How much coding will I need to do for this class?
  - *Between 'none' & 'some' ← For the project*
  - *You can choose a HW3 that involves coding*
- Your assignments seem a little vague, how do I know if I've done enough work?
  - *Each part of the project will have details about what goes into its report. We'll give some kind of rubric for project assignments.*
  - *HW3: amount of work and degree of difficulty matter. We'll talk about that later.*
- How do I know if I'm on the right track?
  - *This is why we have office hours in this course. We are happy to look over drafts of your assignments. I highly recommend doing this!*
- This is basically an opinion class, right?
  - *It might seem so. There are established principles, ways to evaluate rigorously, ways to measure. Usability can be engineering. We're trying to move you towards that end of the spectrum.*

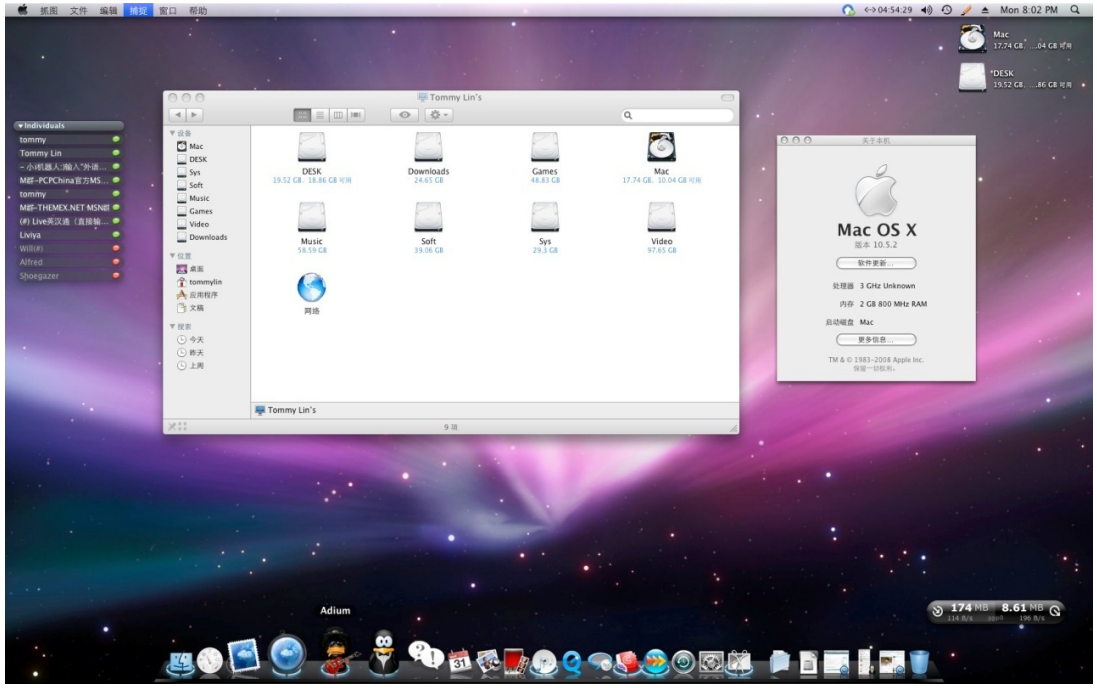
It's a Good Time to Be Alive

- We've come a long way, haven't we?
- Apple Macintosh, 1984



Yeah, things have changed a lot (?)

- Modern Apple Macintosh, OS X, now



What HAS changed since 2005?

- (Your thoughts here)

What HAS changed since 2005

- Interface is not just a traditional "computer screen"
- Touch screens
  - Phones, tablets, cars
- Voice
- Context of use
  - Devices we carry, in cars, embedded screens (really, a fridge?)
- Virtual reality
- Rapid communication and data sharing
  - Wifi, wireless

- New technologies becoming more common, cheaper, more accessible (outside labs, on low-cost machines)

We Have Gadgets for this Course!

- Leap Motion controller
- Amazon Echo (Alexa voice recognition)
- Myo motion detection system
- NeuroSky MindWave Mobile EEG headset
- Oculus Rift VR headsets
- HTC Vive VR systems
- Google Glass wearable glasses

Some cool new toys!

Some cool new toys!

https://www.youtube.com/watch?v=pVdZh03ju6U

Some cool new toys (???)

https://www.youtube.com/watch?v=v1uyQZNg2vE

Final Word for Today on Gadgets

- We'll talk about issues related to these forms of interaction in lectures
- Want to play?
  - Homework 3 is your "vehicle" to explore
  - (Not the class project. Maybe a Sr. Thesis later?)

Back to Homework 2

- What makes an interface bad?
  - What words do we use?
  - OK, what words should we use?
    - A major goal of the course is to teach you principles and practices, their names, definitions, so you can talk intelligently about usability.
  - So no excuses later like:
    - "I knew the idea but just didn't use the right terms."
    - Etc.

Class Activity

- Given a question, do **Think-Pair-Share**:
  - Pairs write down differences
  - Pairs merge results
  - Instructor calls on pairs to share answers
- Question:
  - Think about a hard-to-use software product (or computer-based system).
  - In what way does it have poor usability?
    - General problems
    - Specific examples

Bad Interfaces

- (Your answers here)

Final Words

- CS 3205 can be a lot fun!
  - It's a nice change from other CS classes.
  - Can use concepts from other subjects you've studied
  - It definitely seems "softer" than other CS classes
    - But don't ignore the things you need to learn and memorize
- Questions?
- **Read by Monday: through Section 1.6.2 in ID book**
  - **Link found in Resources on Collab site**