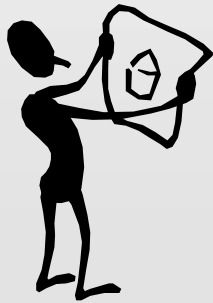


# CMSC 434/828s: Human Factors in Computer and Information Systems

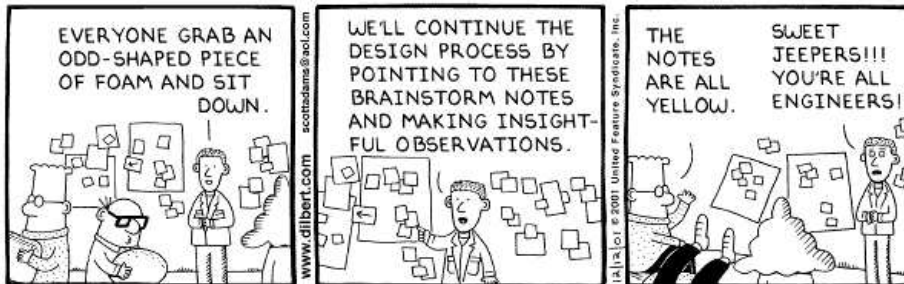
*a.k.a. - Intro to Human-Computer Interaction*



*Evan Golub*

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## Dilbert



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## Which talk would you go to?

**HCIL Seminar Series**  
**Stu Card**  
 Xerox PARC

**"Information Scent and Visual Attention in a Focus+Context Tree Visualization"**

Focus + context information visualizations have sought to amplify human cognition by decreasing the cost structure of information to the user. They have sought to do this by using the display space non-uniformly, making more detail available and using more spatial resource for information predicted to be of interest to the user. But the details of this process and whether it works have never been studied. I will describe how the focus + context distortion of the Hyperbolic Tree browser affects information foraging behavior in a task similar to the CHI '97 Browse Off. There appear to be two countervailing processes affecting visual attention in these displays: strong information scent expands the spotlight of attention whereas crowding of targets in the compressed region of the Hyperbolic Tree narrows it. We can understand these effects somewhat by combining results from theories of information foraging and visual attention. These help us to understand the mechanics of information visualization.

Oct. 24 2:00 pm  
 3258 A.V. Williams Bldg. <http://www.usm1.edu/hcil>

**Logic and AI SEMinar**

November 14, 10:15 am  
 Room AVW 2460

**Diane Litman**  
 AT&T Labs-Research

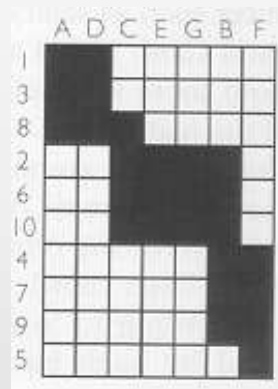
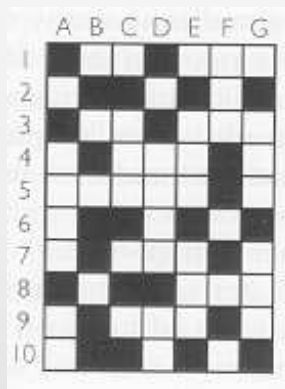
**"Misrecognitions, Corrections and Prosody in Spoken Dialogue Systems"**

Understanding how people speak when they interact with spoken dialogue systems is critical to improving the performance of those systems. In particular, speakers' prosodic behavior provides useful indicators of a) whether a speaker turn will be recognized correctly or not by an automatic speech recognition system, b) whether a speaker is reacting to a system error, and c) whether a speaker is correcting such an error. This talk presents results of analyses of human interactions with the TOCT spoken dialogue system, an experimental system for accessing train schedules by phone. Our analytic results show that there are significant prosodic and lexical differences between misrecognized and correctly recognized speech and between corrective and non-corrective utterances. Our machine learning results show that prosodic and other differences can in fact be used to automatically predict both misrecognitions and their corrections. We suggest how such results may be used to improve system behavior in dialogue systems.

For more info about LAISEM:  
<http://www.cs.umsl.edu/projects/laism/whitson/litman.html>

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## Which graphic tells the clearer story?



**The letters A through G represent chemicals.  
 The numbers 1 through 10 represent crops.  
 Black = Improved    White = Got worse**

Images: Bob Waddington

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**How does this door work?**

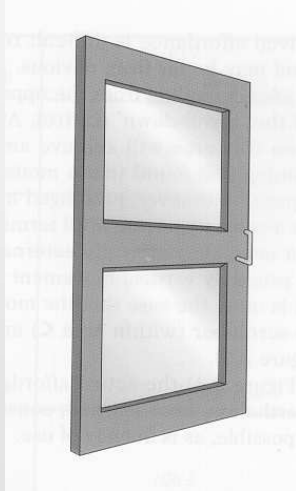


image: Robert Spence

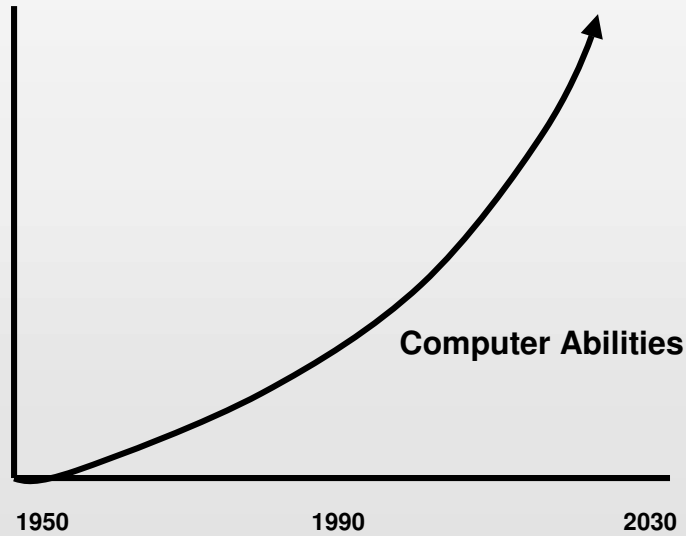
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**Let's vote!**  
**Which of these images would you associate with a phone?**



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## Moore's Law



( These slides are variations of those presented by Bill Buxton )

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## History of HCI: Input / Output devices

### Input / Output

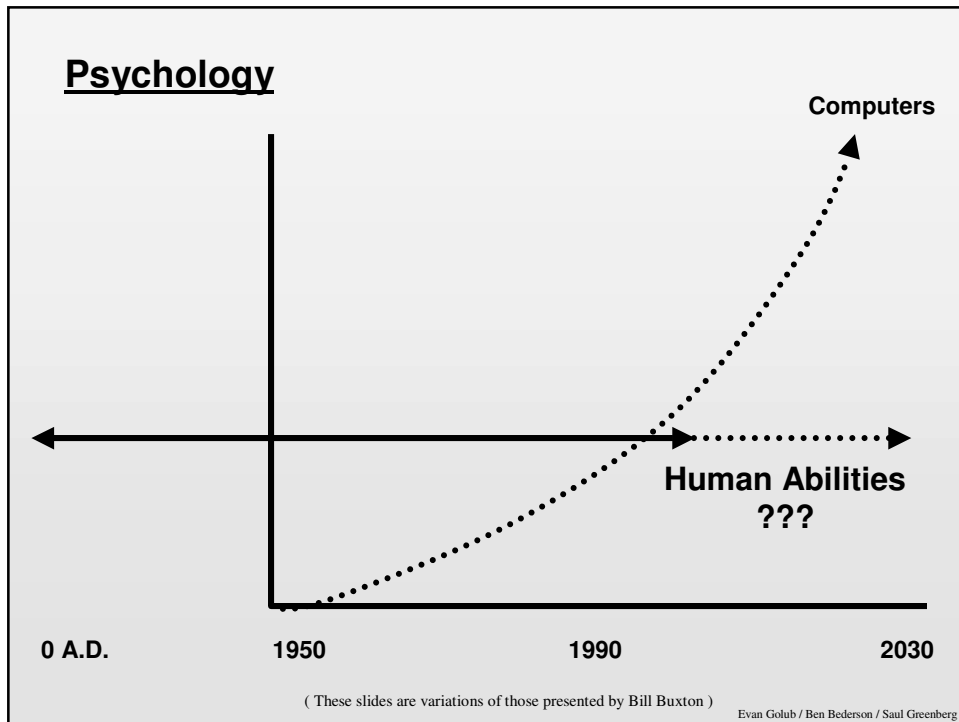
<b>Early days</b>	connecting wires paper tape & punch cards keyboard	lights on display paper teletype
<b>“Modern”</b>	keyboard (different types) cursor keys mouse (different types) microphone	scrolling glass teletype character terminal bit-mapped screen (different types) audio
<b>“Bleeding Edge”</b>	computer vision computer jewelry natural language autonomous agents	head-mounted displays ubiquitous computing implanted devices biometrics

**If you asked someone to draw a computer, what parts would they draw?**

**Would the CPU be among them?**

- keyboards & terminals are just artifacts of today's technologies
- new input/output devices will change the way we interact with computers

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**For example, how do we create a menu?**

**Do we want a simple design or a complex design?**

**Should it be narrow and deep or should it be broad and shallow?**

**Some questions to ask:**

- how many things can the typical user remember
  - there can be speed advantages for expert users that have learned where things are on a menu
- are there costs associated with loading a new page
  - an application such as Microsoft Word
    - how much memory does the machine have
  - a series of web pages
    - how much latency if there in the connection

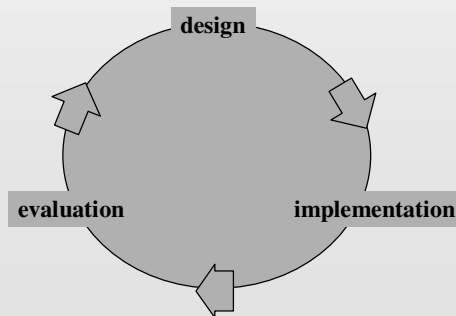
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## Human Computer Interaction

A discipline concerned with the:

- design
- implementation
- evaluation

of interactive computing systems for human use



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## Why an interface design process?

**63% of large software projects go over cost**

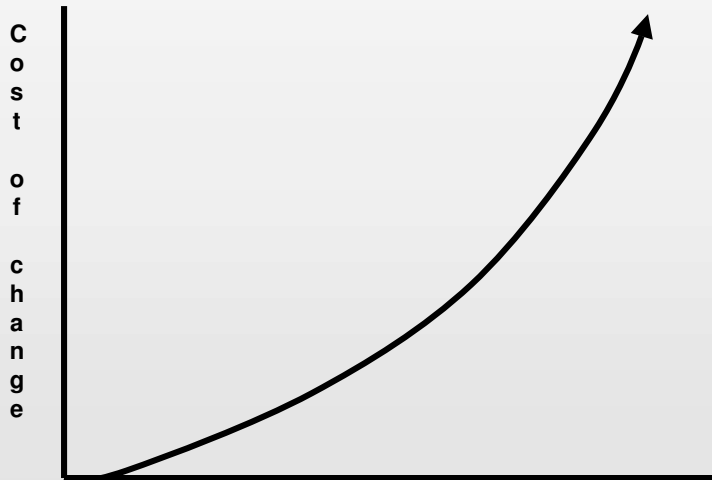
- managers gave four usability-related reasons
  - users requested changes
  - designers overlooked tasks
  - users did not understand their own requirements
  - insufficient user-developer communication and understanding

**Usability engineering is software engineering**

- pay a little now, or pay a lot later!
- far too easy to jump into detailed design that is:
  - founded on incorrect requirements
  - has inappropriate dialogue flow
  - is not easily used
  - is never tested until it is too late

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## Cost to Fix a Problem



The time during development that you notice a change needs to be made

( These slides are variations of those presented by Bill Buxton )

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## Foundations for designing interfaces

### Overview

- Introduction to the course and to HCI

### Understanding users and their tasks

- Task-centered system design
  - the task-centered process
  - developing task examples
  - task scenarios and walkthroughs

### Designing with the user

- User centered design and prototyping
  - user centered system design
  - low fidelity prototyping methods
- Evaluating interfaces with users: qualitative methods
  - observe people using systems via various methods
  - detect inappropriate design and correct by iterative design



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## Foundations for designing interfaces

### Designing visual interfaces

- Psychopathology/psychology of everyday things
  - what makes visual design work?
- Beyond screen design
  - representations and metaphors
- Graphical screen design
  - the placement of interface components on a screen



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## Foundations for designing interfaces

### Principles for design

- Design principles, guidelines, and usability heuristics
  - general design guidelines
  - using guidelines as heuristics to discover usability problems
- High-level models of human-computer behavior

### Implementing Graphical User Interfaces (GUIs)

- Java, Visual Basic, etc.

### Experimental design and HCI

- Evaluating interfaces with users: Quantitative methods
  - experimental design
  - controlled experiments
  - statistics

### The past and the future

- History of HCI
- Visions of the future

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## Objectives

**At the end of this course, you will**

- know what is meant by “good design”
- know guidelines and models as well as how they can be applied to interface design
- know and have applied a variety of methods for involving the user in the design process
- have experienced building applications through various methods and systems
- know and have applied methods to evaluate interface quality
- have sufficient background to apply your training in industry and continue your education

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## How you will be evaluated

**Homework:** 17% of term grade

- There will be five homework assignments during the term. All homework are individual assignments. You may not discuss them with other students or receive outside help from anyone other than the instructor or teaching assistant.

**Projects:** 45% of term grade

- Projects will be done in groups of 3 or 4 students.

**Exams:** 30% of term grade

- There will be two exams during the term.  
- The second exam might have some material that was covered earlier in the term.

**Class Participation:** 8% of term grade

- There will be various exercises done during class time. Participation in these exercises, along with contributions during class discussion will contribute to this portion of the grade.

- One part of this will be a Hall of Fame presentation in class.

**Graduate Students:** *Additional details on syllabus...*



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## **Text and additional references**

### **Required text**

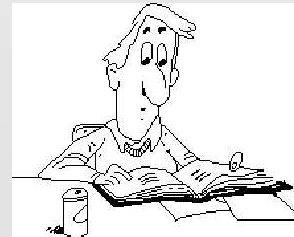
- ***Designing the User Interface: Strategies for Effective Human-Computer Interaction, 3<sup>rd</sup> Edition***, Shneiderman [Addison-Wesley], 1998.

### **Recommended texts / readings**

- Will be posted to the web page and/or announced in class as the term progresses

### **Course web site:**

- <http://www.cs.umd.edu/class/fall2002/cmsc434-0201>



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## **Readings for the week:**

- **Shneiderman: Designing the User Interface - Chapter 1**
- **Norman: The Design of Everyday Things - Chapter 1 (handout)**

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