

Four main threads in the program

- Ethical, legal, social issues in computing
- CS Application areas:
 - artificial intelligence (natural language processing, information retrieval, machine learning)
- IS Application areas:
 - information architecture
 - **human-computer interaction**
- Computer programming

Usability Testing

Human-Computer Interaction

- The study of the design, evaluation, and implementation of interactive computing systems for human use and the major phenomena surrounding them
- Three parts: the person, the computer, and the ways they work together

H. Rosenbaum, Indiana University
S. Krug, *Don't Make Me Think*

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Who is the “human” in HCI?

The user—a person with a laptop, a group working together or remotely, a series of people working in sequence...

A person or persons trying to get a job done using computing technology

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The “human” in HCI

- Physiology
 - What are the physiological constraints?
 - How small can a PDA keypad be and still be usable?
 - Is a keypad the best type of input device for _____?
- Cognitive psychology
 - What is the role of sensory perception?
 - Improved legibility of hypertext (font, background, colors) result in improved reading comprehension
 - Distinguishable sounds indicate whether a task has been successfully completed
 - What is the role of memory?
 - Interface design can take advantage of short term memory by providing appropriate stimuli for recall

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The “computer” in HCI

- A computer
- Computer clusters, grid computing
- Mobile devices
- Embedded computing
- Ubiquitous computing
- Websites, computer games, etc.

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The “interaction” in HCI

- Two directions:
 - We initiate actions when using technology
 - We respond to actions initiated by technology
- Technology allows us to interact indirectly with one another
- Contextual understanding
 - Study context in which actions and events occur
 - Deliver information at appropriate times/places

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Overall goals of HCI

- Design and develop systems that are usable, efficient, and safe
- Design and develop systems that are intuitive
 - Allow people to use them with a minimum of change and disruption
- Make data exchange between people and machines less stressful and less prone to misunderstandings

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How do we shut off our PCs?



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In this series of slides, call out the dominant color as quickly as you can

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BLUE

HCI draws from many fields

- Computer science
- Psychology
- Ergonomics (human factors)
- Engineering
- Language and communication
- Sociology

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The future of HCI

- Embedded computation
 - From desktop computers to everyday objects
 - How will human interfaces to embedded devices differ from those appropriate to workstations?
- Mixed media
 - Images, video, voice, sounds, text, formatted data... exchangeable over broadband
- Group interfaces
- User tailorability

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The future of HCI

- Embedded computation
- Mixed media
- Group interfaces
- User tailorability
- Information utilities
 - Public information utilities and specialized industry services continue to proliferate (e.g., e-banking, e-government)
 - More and more digital information stored on networks, in remote servers
 - Computing appears to “dissolve” into the environment

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How do people use the web?

- What a developer wants to design for:
- A user who reads a page in an orderly way, sees and thinks about the options, and clicks on a carefully chosen link
- The reality:
 - User looks for anything that vaguely resembles what he/she is looking for and is clickable!
 - If it doesn't pan out, click the Back button and try again

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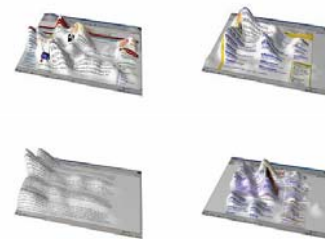
How do people use the web?

- ... as though they are in a great hurry
- They scan—they do not read everything
- They do not choose the *best option*—they choose the *first reasonable option*
 - No real penalty for guessing wrong
 - Weighing options may not greatly improve their chances
 - Guessing is less work
 - And they *are* in a great hurry

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Eye-tracking experiment



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Eye-tracking experiment



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Difficulty of searching in virtual space

How does searching in physical space compare with searching in virtual space?

- No sense of scale
- No sense of direction
- No sense of location

➡ Good navigation elements on a website is important!

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Usability in design

- An approach to product development that incorporates direct user feedback throughout the development cycle
 - To reduce costs
 - To create products that meet user needs

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Web usability

- Purpose and strategy
 - What is the purpose of the site?
 - How is it made clear to the users?
- Content, navigation, interaction
 - How should the content be organized so that users can navigate the site easily?
 - How will users search the content?
- Presentation and media design
 - How should individual pages be designed so people can make use of the information?
 - How should multimedia be used?

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Usability has 5 quality components

- Ease of learning
- Efficiency of use
- Memorability
- Error frequency
- Subjective satisfaction

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Usability testing

- Observe a user's actions and reactions when using a website
- Includes both general navigation through the site and attempts to accomplish specific tasks
- Done throughout the development process, not just at the end!

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Usability test ≠ focus group

- In a usability test, one user at a time is shown something (on a website) and asked to work with it
- In a focus group, a small group of people react to ideas and designs that are shown to them—a group process

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Role/duty of the test facilitator

- Try the test yourself first!
- Protect the participants
- Be empathetic
- Try to hear the participant's thought
- Don't give hints about what to do
- Keep instructions simple
- Take notes during or immediately after each session

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What should observers look for?

- Do they get it?
- Can they find their way around?
- “Head slappers” and shocks
- Inspiration
- Passion
-
-
-
-

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What should observers look for?

- Do they get it?
- Can they find their way around?
- “Head slappers” and shocks
- Inspiration
- Passion
- Remember that we’re seeing the user’s best behavior
- Pay more attention to actions and explanations than opinions

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After a usability test

- Complete notes/report
- Debrief as soon as possible
- Try to “fix” the problems
 - Tweaking vs. major overhaul
 - Resist adding instructions
- Test again!

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