Four main threads in the program

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

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

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

The “computer” in HCI

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

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
**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

**How do we shut off our PCs?**

[Image of PC Start menu]

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

- **BLUE**
- **YELLOW**
- **BLACK**
Overall goals of HCI

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HCI draws from many fields

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

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

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
**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

**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

**Eye-tracking experiment**

**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!

**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
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?

Usability has 5 quality components

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

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!

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

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

What should observers look for?

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

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!