TCS-756
Human-Computer Interaction

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HCI What? HCI Why?

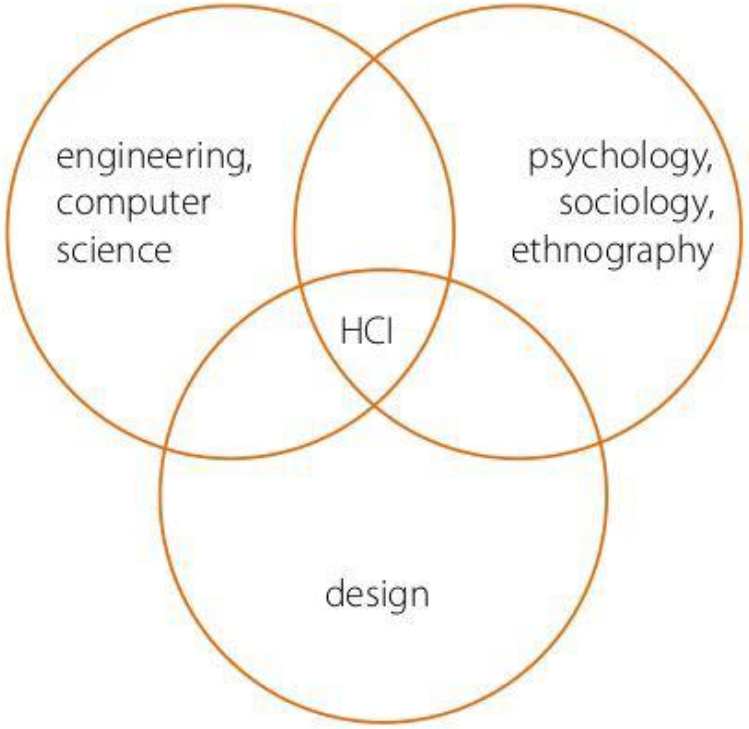
- What happens when a human and a computer system interact to perform a task?
  - task - write document, calculate budget, solve equation, learn about Dehradun/Your CIty, drive home, make a reservation, land a plane...

- Why is this important?

1. Computer systems affect every person
2. Safety, satisfaction, utility is critical
3. Product success depends on ease of use

What is HCI?

- **HCI** (human-computer interaction) is the study of how people
- interact with computers and to what extent computers are or are
- not developed for successful interaction with human beings.



Interfaces in the Real World

- Not just computers!
  - VCR
  - Wristwatch
  - Phone
  - Copier
  - Car
  - Plane cockpit
  - Airline reservation
  - Air traffic control

Goals of HCI

- Allow users to carry out tasks
  - Safely
  - Effectively
  - Efficiently
  - Enjoyably

Usability

- Crucial issue in this area!
- Combination of
  - Ease of learning
  - High speed of user task performance
  - Low user error rate
  - Subjective user satisfaction
  - User retention over time

HCI != Usability

- A usable system is easy to learn, easy to remember how to use, effective, efficient, safe, and enjoyable to use.
- **Usability** is only one part of HCI, but has been one of the main goals
- For example, HCI has contributed to the **development of guidelines and standards** that support designers

HCI != Usability

- HCI has also developed **methods of evaluation** that help us to evaluate the usability of a given product/system (and other aspects of the user experience)
- In addition, HCI uses **mathematical models** to predict users' performance with a system (e.g., Fitt's law to predict mouse movement time, or models that predict search time or mental effort)

HCI != Usability

- HCI also investigates new **interaction paradigms** or new ways of integrating technology in our daily lives (think smart clothes, touch displays, VR/AR, Voice-based interfaces …)

Why do we do HCI in CSE?

- Every engineering discipline includes the **study of breakdowns** and the **design of improved / or new solutions** that address those breakdowns.

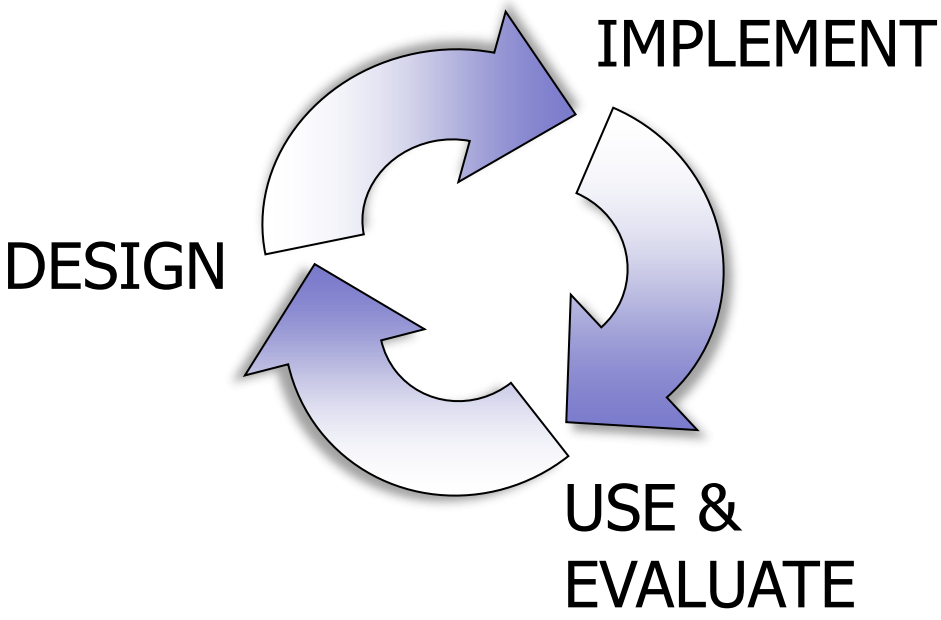
HCI How?

- How do we improve interfaces?

1. Educate software professionals
2. Draw upon fast accumulating body of knowledge regarding H-C interface design
3. Integrate UI design methods & techniques into standard software development methodologies now in place

UI Design/Develop Process

- Tao of User-Centered Design
  - Analyze user's goals & tasks
  - Create design alternatives
  - Evaluate options
  - Implement prototype
  - Test
  - Refine



Above All Else…

- Know the User!
  - Physical & cognitive abilities (& special needs)
  - Personality & culture
  - Knowledge & skills
  - Motivation

- Two Fatal Mistakes:

1. Assume all users are alike
2. Assume all users are like the designer

Design Evaluation

- “Looks good to me” isn’t good enough!
- Both subjective and objective metrics
- Some things we can measure
  - Time to learn
  - Speed of performance
  - Rate of errors by user
  - Retention over time
  - Subjective satisfaction

Course Overview

- Human abilities
- Evaluate an existing system

  (without involving users)
- Design for success
- Dialog & interaction styles
- Evaluate your design (with users)
- Special topics
  - CSCW, InfoVis, Ubicomp, Agents, Audio

Upcoming

- History & Frameworks of HCI
- Project info
- Futuristic scenarios
- Design of Everyday Things (DOET)

- Start reading...
  - DFAB *(note order of chapters)*
  - DOET

What Makes a Good Project

- Typically:
  - Access to domain experts & users
  - “Real” clients
  - Interesting human issues
  - Rich domain for design
- Theme has a LOT of range for topics

Previous Topic Ideas

- Mobile/handheld (cars, tour guides, etc.)
- Wedding planner
- GIS
- Calendar agent (speech)
- Audio / Web sites
- Domain that you know well

Course Information

- Books
  - ***Human-Computer Interaction*, by Alan Dix, Janet Finlay, Gregory Abowd, and Russell Beale**. Prentice Hall, 2004.
  - ***The Design of Everyday Things*, by Donald Norman**. Currency/Doubleday, 1990.
- Web
  - http://www.cc.gatech.edu/classes/AY2010/cs6750_fall
  - Syllabus & Class Info
  - Schedule
  - Assignments
  - T-square (class shared webspace)
  - HCI resources

Resources

- Previous courses, courses elsewhere, info on the web
- HCI Digital Library
- Books
- Web sites
- Standards documents
- Go further
  - Move beyond lectures & book
  - Further courses
  - Step into research