Human Computer Interaction

Introduction to HCI
User Interface Design
The Perfect User (every designer ‘s wish)
I designed the user interface myself. How do you like the colors?

PUKE

FLU? INTERFACE DESIGN.

You have chronic mahjobbis crappus but that's not why you puked.

Have you been exposed to any user interfaces designed by engineers?

You have interface poisoning. You'll be dead in a week.
What is Interaction Design?

• Designing interactive products to support the way people communicate and interact in their everyday and working lives

[Sharp, Rogers and Preece, 2011]

• The design of spaces for human communication and interaction

[Winograd, 1997]
Goals of interaction design

• Develop usable products
  – Usability means easy to learn, effective to use and provide an enjoyable experience

• Involve users in the design process
Which Kind of Design?

• Number of other terms used emphasizing what is being designed, e.g.
  – user interface design, software design, user-centered design, product design, web design, experience design (UX)

• Interaction design is the umbrella term covering all of these aspects
  – fundamental to all disciplines, fields, and approaches concerned with researching and designing computer-based systems for people
Interaction Design

- User Experience Design
- Information Architecture
- Communication Design
- User Interface Engineering
- Usability Engineering

Industrial Design

Human Factors

Human-Computer Interaction
Field of Interaction Design

Relationship among contributing academic disciplines, design practices, and interdisciplinary fields concerned with interaction design.
Common Issues in User Interface Design

- Software developers are forced to “do it all”
- Often based on intuition and experience than on theory-based models
- Tendency to let the art of interface design beats its usability
- Inconsistent features that do not fit into a good user interface design criteria
Importance of Interface Design

• 63% of large software projects go over cost
  – Managers gave 4 usability-related reasons
    1. User requested changes
    2. Overlooked tasks
    3. Users did not understand their own requirements
    4. Insufficient user-developer communication & understanding
Importance of Interface Design

• Usability engineering is software engineering
  – Pay a little now, or pay a lot later!
  – Far too easy to jump into detailed design that is:
    1. Incorrect requirements
    2. Inappropriate flow
    3. Difficult to use
    4. Never tested until it is too late
Goals of User Interface Design

• What constitutes a good user interface?
• How do we know whether we have a good HCI design?
• Ben Shneiderman reproduced standard criteria from the U.S Military Standard for Human Engineering Design Criteria:
Goals of User Interface Design

1. Achieved required performance by operator, control and maintenance personnel
2. Minimize skill and personnel requirement and training time
3. Achieve required reliability of person-computer combination (reliability, availability, security and data integrity)
4. Foster design standardization within and among system (integration, consistency, portability)
Goals of User Interface Design

• To make things even more concrete, common Measurable factors for Usability (Nielsen):
  1. Time to learn how to operate the system
  2. Performance speed
  3. Error rate made by users
  4. User’s Retention over time of information presented
  5. User’s Subjective satisfaction with the system
  6. Cost
Bad Design (1)

• How fast am I going?

[www.baddesigns.com]
Bad Design (2): Elevator controls

• How do I get out of the lift?

[www.baddesigns.com]
Bad Design (2)

- Elevator controls and labels on the bottom row all look the same, so it is easy to push a label by mistake instead of a control button.

- People do not make the same mistake for the labels and buttons on the top row. Why not?

From: www.baddesigns.com
Bad Design (3): vending machine

From: www.baddesigns.com
Bad Design (3): vending machine

- Need to **push button first** to activate reader
- Normally **insert bill first** before making selection
- Contravenes well known convention

From: www.baddesigns.com
Bad Design (4): plug connector

- Where do you plug the mouse?
- Where do you plug the keyboard?
- Top or bottom connector?
- Do the color-coded icons help?

[www.baddesigns.com]
Bad Design (5): voice mail system

• Imagine the scenario:

You’re are staying at a hotel. The hotel has a voice mail system for each room. You want to find out if you have a message.

• How do you access the message?
• What is the problems?
Bad Design (5): voice mail system

- Infuriating
- Confusing
- Inefficient, requiring you to carry out the number of steps for basic tasks
- Difficult to use
- No let you know whether any message have been left or how many there are. You have to pick up the handset to find out and then go through a series of steps to listen them
- Not obvious what to do: the instructions are provided partially by the system and partially by a card beside the phone
Good design(1)

- **Marble answering machine** (Bishop, 1995)
- Based on how everyday objects behave
- Easy, intuitive and a pleasure to use
- Only requires one-step actions to perform core tasks
Good design(1)

- How does the “marble” answering machine differ from the voice mail system?
Good design (1)

- Use familiar physical object “marble pinball” that visually represent how many incoming message been left.
- Play recorder message
  - dropping the marble into a slot in the machine
- Dial the caller who left the message
  - Dropping the same marble pinball into another slot on phone
- It is aesthetically pleasing and enjoyable to use
- It only required one-step actions to perform core tasks
- It is a simple but elegant design
- It offers less functionality and allow anyone to listen to any the message
Good and bad design

The TiVo Remote

APEX
A standard Remote

Two contrasting remote control devices. How do they differ in their design and use?
Good & Bad Design

• What is wrong with the remote controller on the right?

• Why is the TiVo remote so much better designed?
  • Peanut shaped to fit in hand
  • Logical layout and color-coded, distinctive buttons
  • Easy to locate buttons
What to Design?

• Need to take into account:
  • Who the users are
  • What activities are being carried out
  • Where the interaction is taking place

• Need to optimize the interactions users have with a product
  • So that they match the users’ activities and needs
Core Characteristics of Interaction Design

• Users should be involved through the development of the project
• Specific usability and user experience goals need to be identified, clearly documented and agreed at the beginning of the project
• Iteration is needed through the core activities
Understanding Users’ Needs

• Need to take into account what people are good and bad at
• Consider what might help people in the way they currently do things
• Think through what might provide quality user experiences
• Listen to what people want and get them involved
• Use tried and tested user-centered methods
Working in Multidisciplinary Teams

• Many people from different backgrounds involved

• Different perspectives and ways of seeing and talking about things

• Benefits
  – more ideas and designs generated

• Disadvantages
  – difficult to communicate and progress forward the designs being create
ANY questions?