User Interfaces

Human-Computer Interaction

- From Wikipedia:

  Human–computer Interaction (HCI) involves the study, planning, and design of the interaction between people ([users](#)) and computers. It is often regarded as the intersection of [computer science](#), [behavioral sciences](#), design and [several other fields of study](#).

  - http://en.wikipedia.org/wiki/Human-computer_interaction

  Web page includes 13 Design Display Principles from *An Introduction to Human Factors Engineering* by Christopher Wickens *et al.*

Utility and Usability

- *Utility* = whether [a system] provides the **features you need**.

- *Usability* = how **easy & pleasant** these features are to use.

- ***Useful* = usability + utility**.

- Usability components:
  - Learnability
  - Efficiency
  - Memorability
  - Errors
  - Satisfaction

From "Usability 101: Introduction to Usability," Jakob Nielsen's Alertbox, 2003

Graphical User Interfaces

- From Wikipedia:

  A graphical user interface (GUI) is a type of [user interface](#) that allows [users](#) to [interact](#) with electronic devices using images rather than text commands.

  - http://en.wikipedia.org/wiki/Graphical_user_interface

  Web page includes a history of the development of the graphical user interface that complements The Machine that Changed the World, Part III.

8 Important Characteristics

1. Clear

2. Concise

3. Familiar *(meets expectations)*

4. Responsive *(fast, provides feedback)*

5. Consistent *(allows user to develop patterns, extrapolate new behavior)*

6. Attractive

7. Efficient

8. Forgiving

From "8 Characteristics Of Successful User Interfaces," Dmitry Fadeyev, circa 2009

Guidelines for
Good Interface Design

- Consistency of Elements and Style

- Provide Clear Navigation
  - Where did I come from?
  - Where am I now?
  - Where can I go from here?

- Logical Grouping of Tasks

- Spatial Organization of Visual Elements

- Care for the User

From "Common Principles: A Usable Interface Design Primer," Rick Oppedisano, circa 2002

10 Design Fundamentals

1. Know your user
2. Pay attention to patterns
3. Stay consistent
4. Use visual hierarchy
5. Provide feedback

6. Be forgiving
7. Empower your user
8. Speak their language
9. Keep it simple
10. Keep moving forward

From "10 User Interface Design Fundamentals," Kyle Sollenberger, 2012

Gestalt Design Laws

- Contrast – Make things that are different look different

- Repetition - Repeat the same style in a screen and for other screens

- Alignment - Line screen elements up! Yes, that includes text, images, controls and labels

- Proximity - Group related elements together. A set of input fields to enter an address should be grouped together and be distinct from the group of input fields to enter credit card info.

Quoted from Craig Pickering, in an answer in stackoverflow ("Follow Basic Design Principles," http://stackoverflow.com/questions/90813/best-practices-principles-for-gui-design)

HCI Topics

- Accessibility

- Gender and Cultural HCI

- Information visualization

- Techniques, e.g., progressive disclosure, zooming interfaces

- Look and feel

- Handheld device user interfaces

- Wearable computing

- Usability testing

- HCI in popular media (e.g, *2001: A Space Odyssey, Dr. Who, Iron Man, Lost in Space, Minority Report, Star Trek, Terminator*)