CSC420

Topic 1: Humans

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GUI

- **Interactive**
  - Vs non-interactive (e.g., a news report)
- **Graphical**
  - Vs command line
  - Vs auditory (speech, sounds, etc)
  - Vs multi-media
- **Virtual: on computers (of all sorts)**
  - Vs mechanical (e.g., steering wheel)
  - Important: computers have *two* levels of interfaces!

Why humans?

- Interfaces (of this type) mediate a *conversation* between a human and something else
  - A good interface helps humans with the conversation
  - The best interface is unnoticeable (important: exceptions)
- The purpose of the conversation is to achieve some *task*
- To build a good interface, a designer must *know* humans
  - Empathy
  - Synthesis
- …as well as the task
- Know your target humans!

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What are humans?

- The good
  - Have huge potential
  - Have free will
  - Creative
  - Curious
- The bad
  - Stupid
  - Ignorant (and want to remain so!)
  - Weak-willed
  - Lazy
- The ugly
  - *Inconsistent*

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Human Incosistence

- There is nothing that works for everyone
- No sense to talk about rules
- Patterns
  - Common solutions to certain design tensions
  - Best practices *in this culture*
  - You are humans, too

Human Laziness -> User Intiuitiveness

- Humans want it *easy*
- For GUIs, easy translates to familiar
- User-intuitive is a fancy word for familiar

- *The only user-intuitive interface is the nipple. It is all learned afterwards*

- Once again: *Thou shalt know thy users.*

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Users: Goals

- Explore
- Care for
- Learn
- Control/Monitor
- Create/Design/Construct/Synthesize
- Converse/Socialize
- Have fun
- etc.

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Users: Emotions

- Basic: like/dislike, intuition (ties to familiarity)
- Preferences
- Social context
- Beliefs
- Values

- User feelings are, sadly, important. Probably more important (and definitely less scarce) than user thoughts.

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Research Your Users

- Empirical discovery

- Goals
- Tasks
- Language
- Familiarity with the field
- Attitudes

- Direct observation
- Case studies
- Surveys
- Personas

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Safe Exploration

- Do stuff without any consequences
  - Obviously impossible for any meaningful task
  - Undo, revert, back to defaults, etc help
- In other words, such users want idiot-proof interfaces

- "The problem with making completely fool-proof plans lies in that people often underestimate the ingenuity of complete fools." -- Douglas Adams

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Instant Gratification

- "I want it all, I want it now!" -- Queen
- Immediate results raise confidence
  - In other words, users generally lack long-term thinking, and are greedy (follow greedy algorithms)
- If you know what the user is likely to do, stick it in his/her face
  - e.g., Google
  - (If you know what the user *will* do, why the interface?)
- Don't hide intro functionality behind ads, registrations, anything that postpones the "wohoo" moment

Satisficing

- (Some) people are willing to accept "good enough" instead of "best" if learning all the alternatives might cost time or effort.

- I.e., most users will scan an interface and try the first thing that *might* work.

- Labels: short and to the point. *Users do not like to read.*

- Form and color are preferable to text.

- Layout should communicate meaning.

- Navigation (especially "undo") should be easy and obvious.

- Know thy users: newbies want *simple*.

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Changing Goals

- …in midstream. I am not joking. This is common.
- Only two ways to deal with this:
  - Always provide global navigation, unless there is a really good reason not to (e.g., wizards)
  - Support very easy (one-click) reentrance at all points of a long-lived task

Deferred Choices

- Follows from instant gratification
- Don't put too many choices
- Of those presented, clearly mark the required ones
- Use good defaults, and be aware they still have a cognitive cost
- Support reentrance for the non-required options

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Incremental Construction

- a.k.a. Iterative Refinement
- Make it possible and obvious to build small parts at a time
- Quick changes/saves/etc
- Feedback is critical
  - REPL (read-eval-print loop)
- Should encourage a sense of flow

Habituation

- Users expect certain things to just work
- Know thy users
- Separate from that: *consistency within your interface is paramount*
  - It is not good to have a learned action not work in some part of your interface
  - It is *incredibly evil* to make it do *something else* under certain conditions

Spatial Memory

- Users expect to find things where they placed them
- Users remember controls spatially

- It is fine to add to an interface, but not fine to move things around
- Consistency within the application is important
- Never change the top/bottom (or first/last) control/menu option/whatever

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Prospective Memory

- People who plan want to be able to remind themselves about future intentions

- Not much you can do about it, except *not to get in their way*

- Try (very carefully) giving people the tools they need for such ad-hoc systems

- This will likely remain unsolved until someone creates a semantic parser (a.k.a. AI)

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Non-GUI Patterns

- Streamlined repetition
  - Can be executed in GUIs with macros and the like, but does not work well
- Keyboard only
  - Always provide keyboard shortcuts
  - Try to include keyboard-aware controls as much as possible (e.g., a scrollbar that users can move with the arrows rather than one moved with the mouse only)
  - Important for data-entry applications

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The Social Factor

- People like to have impact on the world
- People are influenced by others' opinions, and like following others' advice
- Moral: provide for social-aware controls
  - You don't have to encourage users to use them; forcing them is *very* evil