User Interaction:
The Human

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Individuals vary in their abilities

- long term
  - sex, physical and intellectual abilities
- short term
  - effect of stress or fatigue
- changing
  - age

Ask yourself:
will design decision exclude section of user population?
NAME, STUDENT ID, COMMENT

HUMAN → USER

ITERATIVE DESIGN

ANALYTICAL

GENERATIVE

DEPLOY

DESIGN
SOCIETAL

HUMAN

TECHNOLOGY

STERLING

PAPERS

XML/JSON
Addressing different skills and environments

- "Plasticity"
- Adapting to different environments easily.
- What environments?
Emotion influences human capabilities
Emotion

- Various theories of how emotion works
  - James-Lange: emotion is our interpretation of a physiological response to a stimuli
  - Cannon: emotion is a psychological response to a stimuli
  - Schacter-Singer: emotion is the result of our evaluation of our physiological responses, in the light of the whole situation we are in
- Emotion clearly involves both cognitive and physical responses to stimuli
Emotion

- The biological response to physical stimuli is called affect.
- Affect influences how we respond to situations:
  - positive → creative problem solving
  - negative → narrow thinking
“Negative affect can make it harder to do even easy tasks; positive affect can make it easier to do difficult tasks.”

D.A. Norman, 2002
"Aesthetic-Usability Effect" is a phenomenon

- aesthetic designs
  - are perceived as more usable
  - are more likely to be used
  - make people more tolerant of problems
- unaesthetic designs
  - may be more usable, but don’t get used

http://www.apple.com/ipodnano/#ad
The Human: Designing for people

From “Flow: Psychology of Optimal Experience” by Csikszentmihalyi
Fitt's Law

\[ \text{Time to Click} = a + b \log_2 \left( \frac{\text{Distance}}{\text{Size}} + 1 \right) \]
• 3 Models of Humans
  • Model Human Processor
    • Theoretical
  • Fitt’s Law
    • Empirical \([a+b \log(d/s +1)]\)
  • Flow
    • Design Concept
• Humans are heavily biased by expectations
  • From our biology to our cognitive response
• Think about design in terms of your actual real users
  • What are their capabilities?
  • What do they expect?
“Most Advanced, Yet Acceptable”

Leverage existing {physical, cognitive, motor, aesthetic} expectations to introduce new and better interactions, to create a better world.
Discussion

Form groups of 2 or 3

Pick a paper and discuss how the results relate to our biological abilities and/or the model human processor
The Model Human Processor

- Long-Term Memory
  - Working Memory
    - Visual Image Store
    - Auditory Image Store
  - Perceptual Processor
    - Ears
  - Motor Processor
    - Eyes
  - Cognitive Processor
    - Muscles

Card, Moran, Newell (1983)