cs465

principles of user interface design, implementation and evaluation

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1. Perception

   awareness of the elements of environment through physical sensation <color perception>

   consciousness

   quick, acute, and intuitive cognition

3. Cognition

   the act or process of knowing including both awareness and judgment
Cognitive and Perceptual in HCI

A vital foundation for interactive-systems designers is an understanding of the cognitive and perceptual abilities of users (Wilkens 2000).

The human ability to interpret sensory input rapidly and to initiate complex actions makes modern computer systems possible. In milliseconds, users recognize slight changes on their displays and begin to issue streams of commands. (Shneiderman 2005)
Cognitive and Perceptual abilities:

- Personality differences
- Variations in physical abilities and physical spaces
- Cultural and international diversity
- Users with disabilities
- Older adult users
- Designing for and with children
Human Cognitive Processes:

• Short-term and waking memory
• Long-term and semantic memory
• Problem solving and reasoning
• Decision making and risk assessment
• Language communication and comprehension
• Search, imagery, and sensory memory
• Learning, skill development, knowledge acquisition, and concept attainment
Factors affecting perceptual and motor performance

• Arousal and vigilance
• Fatigue and sleep deprivation
• Perceptual (mental) load
• Knowledge of results and feedback
• Monotony and boredom
• Sensory deprivation
• Nutrition and diet
• Fear, anxiety, mood, and emotion
• Drugs, smoking, alcohol
• Physiological rhythms
Design as Applied Perception
Because the luminance channel has a far greater capacity to respond to visual detail, it is essential that whenever detailed information must be conveyed there should be luminance contrast between foreground and background.

Ideally, 10:1 light-to-dark ratio
If a symbol is to be made clearly distinctive, it must be made different from all the surrounding symbols in terms of some **simple** basic attribute.
Gestalt

- Proximity
- Good Continuity
- Symmetry
- Similarity
- Common Fate
- Common region
- Connectedness
Mapping attributes of visual characteristics of a visual object. Thus, object shape, color, and surface texture can all be varied to represent attributes of some complex information construct.

(Wilkens)
Ponzo Illusion
Impossible Objects
HCI Project Motivations

Life-critical systems

Industrial and commercial uses

Office, home, and entertainment applications

Exploratory, creative, and collaborative interfaces
  chat, google, drawing, music

Sociotechnical systems
  voting, reputation, trust, privacy

Universal Access
Design with **Affordances** in Mind  !!!