CSE 165: 3D User Interaction

Lecture #11: System Control

Announcements

- Homework Assignment #4
  - Due February 26th at 2pm

Graphical Menus – Design

- Placement
  - world-referenced (freely in world)
  - object-referenced (centered to object in world)
  - head-referenced (view centered)
  - body-referenced
  - device-centered
- Selection
  - Degrees of freedom, constraints
- Representation and structure
  - form, size, space
  - hierarchy: functional and semantic grouping, context sensitivity, control coding

Voice Commands

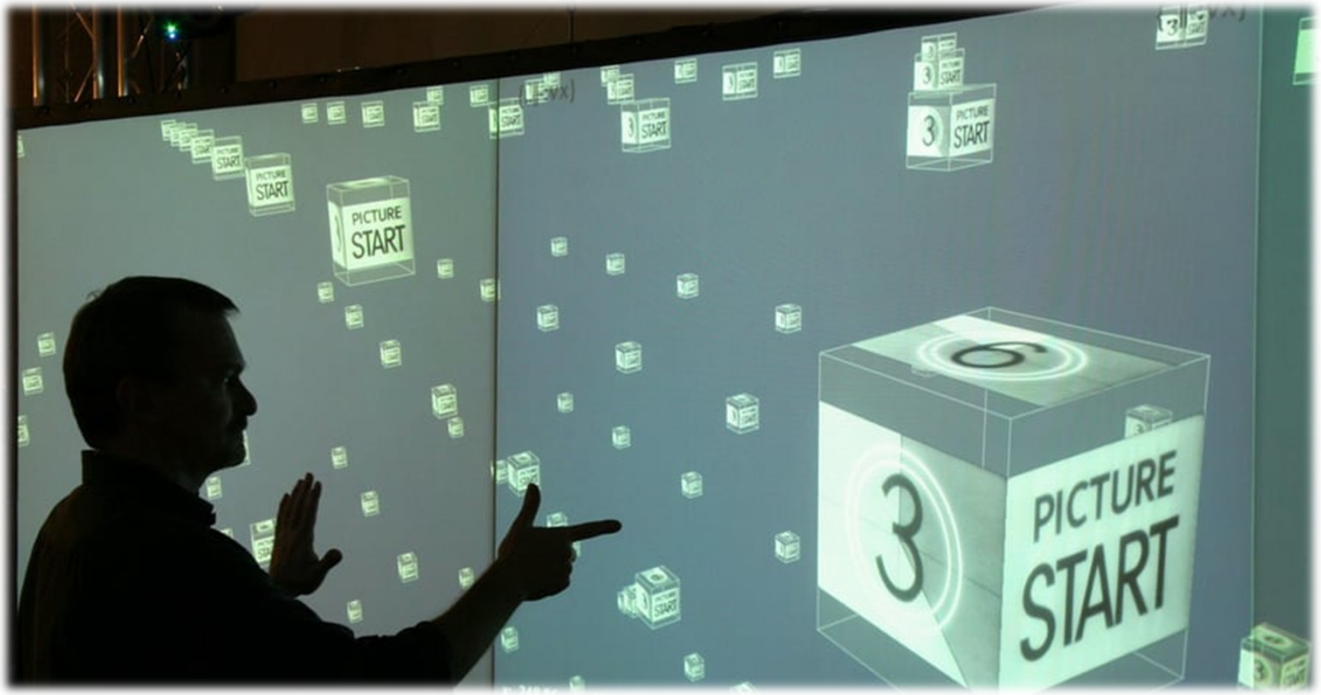
- Speech recognition
- Spoken dialogue techniques
- Requires
  - speech recognition engine
    - speaker dependent vs. independent
    - varying vocabulary size
  - good microphone
- Invisible to the user
- Push to talk

Gestural Commands

- One of the first system control techniques
- Posture – static hand configuration
- Gesture – dynamic movement

Oblong Industries: G-Speak

- https://vimeo.com/2229299

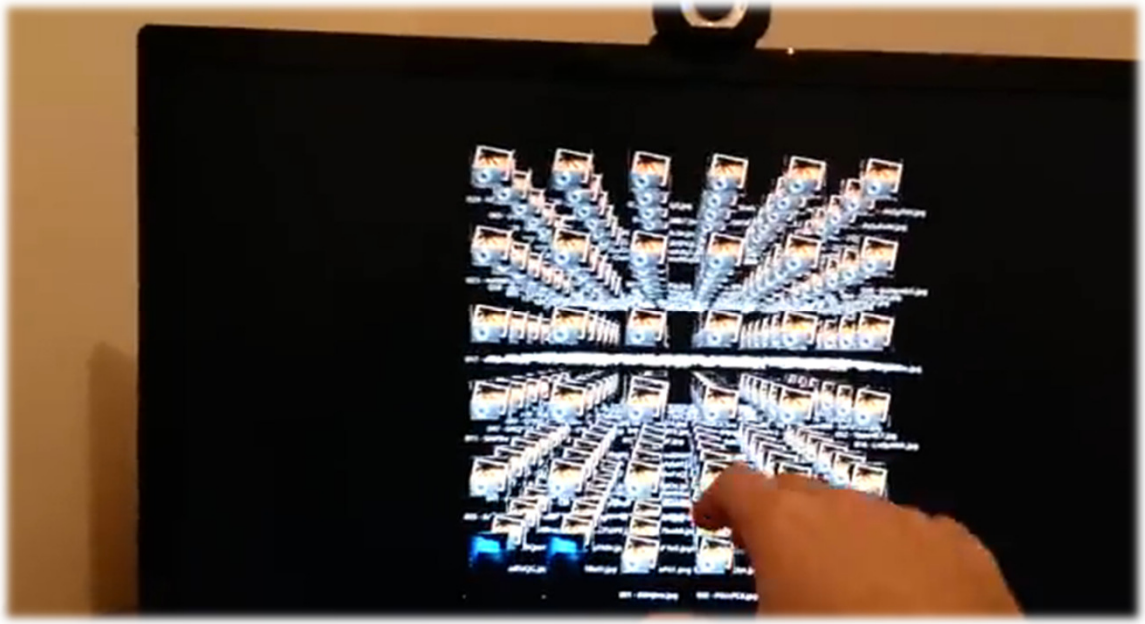


Gesture Command Types

- Speech connected gestures: spontaneous gesticulation while talking
- Mimic gestures: directly describe a concept
- Symbolic: e.g., thumbs up
- Sign language: artificial vocabulary

Holotouch File Browser

- http://www.youtube.com/watch?v=mPKdTMmdQ9A



Devehat 2014

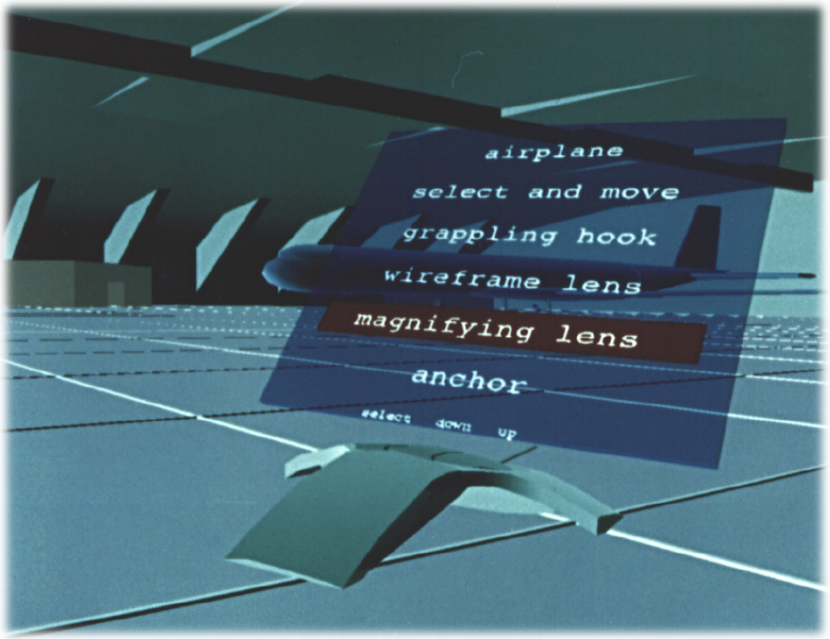
Tools

- Provide directness of interaction
- Familiar (real-world derived)
- Physical tools
  - real physical objects (props)
  - may have graphical representation
- Virtual tools

CavePainting (Keefe 2001)

Virtual Tool belt

Tricorder



Wloka, Greenfield 1995

- Physical input device has virtual representation
- Functionality changes according to selected tool

Tangible User Interfaces

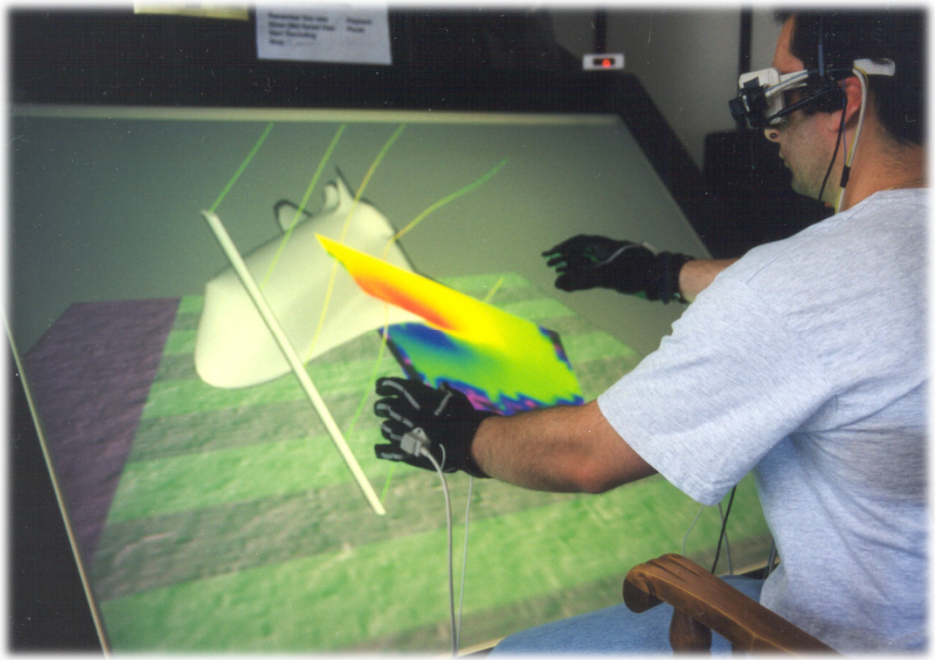
Reactable (Jorda et al., 2005)

Video:
https://www.youtube.com/watch?v=tgcpyZIqvT8

Multimodal System Control

- More than one input modality (speech, gesture, facial expression, etc…)
- Advantages
  - Allows decoupling of interaction modes
    - Avoids switching between, e.g., navigation and other interaction mode
  - Error reduction and correction
  - Flexibility and complementary behavior
  - Control of mental resources: reduce cognitive load

Multimodal Interaction – Examples



Hand gestures and speech [Van Dam et al. 2000]