

CSE 165: 3D User Interaction

Lecture #13: Travel Part 2

Instructor:
Jurgen Schulze, Ph.D.

Announcements

- Homework Assignment #4
 - Due February 27th at 1:00pm
- Homework Assignment #5 is on-line
- TiE event tonight 6-9pm:
“Virtual Reality and The Future of Immersive Experiences”
 - <http://southcoast.tie.org/>

Travel Part 2

Gait Master

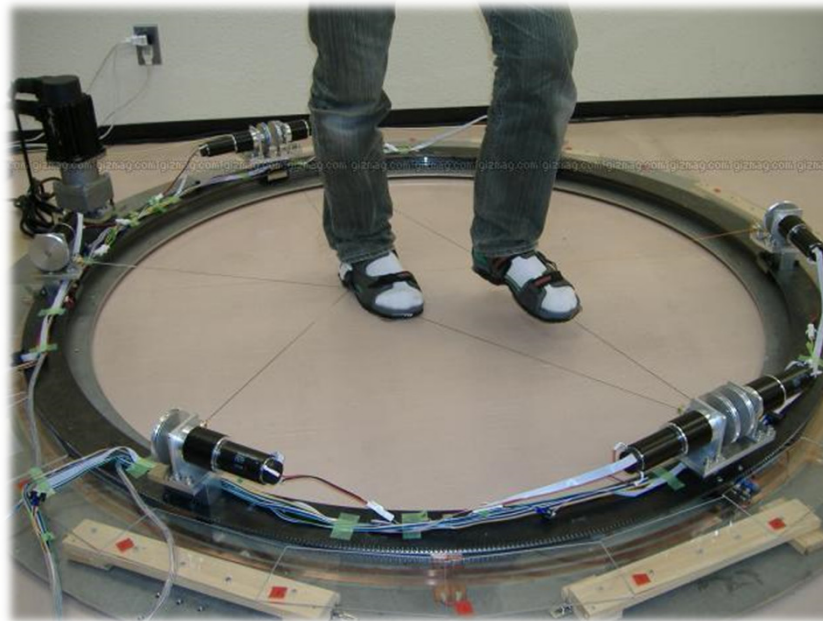
- Video

- <http://www.youtube.com/watch?v=RDDH1iqoDzU>



String Walker

- Video from Emerging Technologies, SIGGRAPH 2007
- <http://www.youtube.com/watch?v=hyLKjyL-Dw8>



Steering Techniques

- Steering:
 - Continuous specification of direction of motion
- Techniques:
 - Eye gaze
 - Head direction
 - Hand pointing
 - Torso-directed
 - Physical device (steering wheel, etc.)

Steering by Eye Gaze

- Move viewpoint in direction of eye gaze
- Gaze direction determined from eye tracker
- Cognitively simple
- Doesn't allow user to look to the side while traveling



Steering by Head Orientation

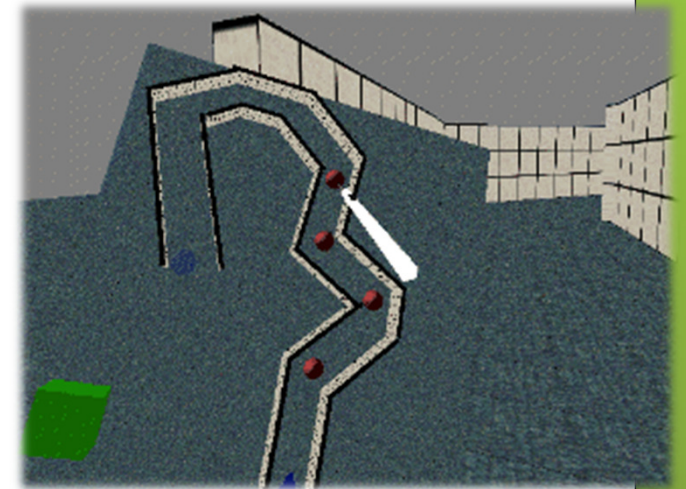
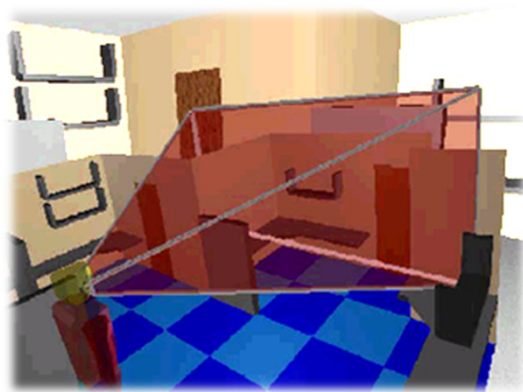
- Move viewpoint in direction head is pointed
- Direction determined from head tracker
- Cognitively simple
- Allows user to look to the side while traveling, but hard to decouple eye gaze and head direction

Steering by Pointing

- Similar to steering by head orientation, but uses hand tracker instead of head tracker
- Cognitively slightly more complex than steering by eye/head
- Allows travel and eye gaze in different directions

Route-Planning

- One-time specification of path
- Implementation:
 - Draw entire path
 - Specify points along path
 - Manipulate user representation

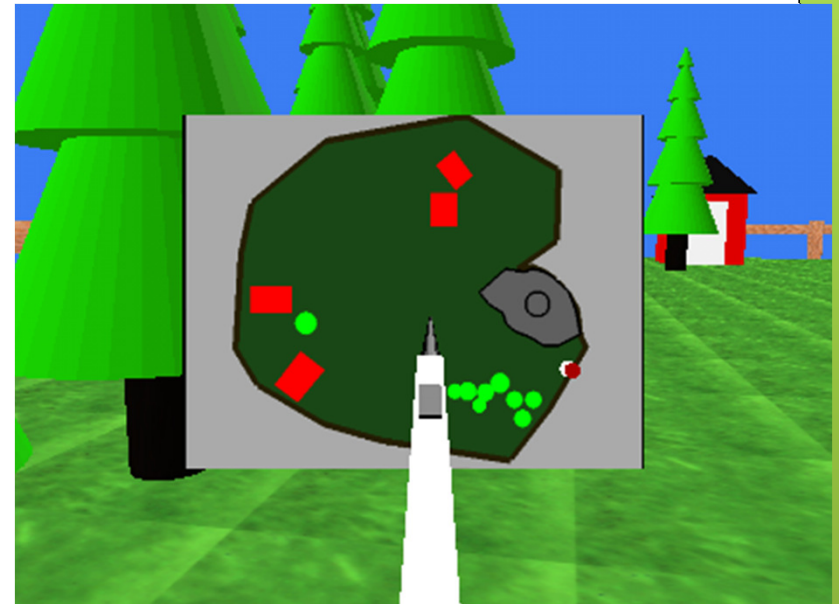


Target-Based Techniques

- Direct specification of destination
- Techniques:
 - Point at target object
 - Choose target from list
 - Enter coordinates
 - Use Map/WIM

Map-Based Travel Techniques

- User represented by icon on 2D map
- Drag icon with stylus to new location on map
- When released, viewpoint moves smoothly to new location



Manual Manipulation – Grabbing the Air Technique

- Use hand gestures to move yourself through the world
- Metaphor of pulling a rope
- Can be one-handed, but often a two-handed technique
- Works well with Pinch Gloves or Razer Hydra

Viewpoint Orientation Techniques

- Head tracking
- Orbital viewing
- Non-isomorphic rotation
- Virtual sphere (trackball)

castAR

- <https://www.youtube.com/watch?v=hL1qT0TK6aw>



System Control

Universal 3D Interaction Tasks

- Selection
- Manipulation
- Navigation
- System control
- Symbolic input

System Control

- Often considered glue of 3D UI
- Commands are issued to
 - request system to perform a particular function
 - change interaction mode
 - change system state