A Brief Introduction to 3D Content

Our world is three dimensional but our display devices are two dimensional...

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Introduction

☞ What is the problem?
Sculpture is 3D – This presentation is 2D

♫ How do we solve this problem?
Our eyes have 2D retina (mostly)

❖ How do we solve this problem?
Three Dimensional Problem vs. Two Dimensional Representation

Three Dimensional Diagram:
- Force $F_1$: 800 N at 60°
- Force $F_2$: 5 units at 30°
- Force $F_3$: 4 units at 30°

Two Dimensional Diagram:
- Force $F_1$: 1 ft at 45°
- Force $F_2$: 5 ft at 30°
- Force $F_3$: 3 ft at 45°
Can Render Three-D Virtual Objects to Two Dimensions
Physical Component

In the real world . . .
Physical Component

In the virtual world . . .
Depth Cues

- Monoscopic
- Stereoscopic
Depth Cues - Monoscopic

- Interposition
- Shading / shadows
- Size
- Linear perspective
- Surface Texture Gradient
- Height in visual field
- Atmospheric effects
- Brightness
Depth Cues - Stereoscopic

☞ Stereopsis
  - two eyes
  - see things from two perspectives
  - various technologies to implement
  - most important up close
Depth Cues - Motion

Motion Cues
- very strong
- body movement vs. object movement
- work in conjunction - proprioception
Depth Cues - Physiological

- Accommodation (focus)
- Convergence (in / out)
Depth Cues – Other Senses

- Sound
- Smell
- Taste
Computer Helps With Depth Cuing

- Maya
- 3DS
- Blender

- Preview for tomorrow
Questions?