

CSE 190: Virtual Reality Technologies

LECTURE #3: MONOCULAR VISION

VR Content Presentations

Zhuoqun Xu (Robin)

- <https://www.youtube.com/watch?v=gOc1dAcfCfk>

Tian Yang

- <https://itunes.apple.com/app/inmind-vr/id971720127>

Anish Kannan: Perl

- <https://www.youtube.com/watch?v=WqCH4DNQBUA>

Connor Smith: Notes on Blindness

- <https://www.oculus.com/experiences/gear-vr/1015802351839289/>

Announcements

Homework project 1 is on line.

- Will be discussed at 3:30pm today in CSB 002

ArtPower competition

- Submission deadline April 14th, festival May 10th
- <http://artpower.ucsd.edu/programs/student-new-media-festival/#competition>

Unity programmer wanted for autism app for cell phone based VR.

VR lab opening May 2nd 3pm

Depth Cues – How Do We See 3D?

Monocular, static cues

Motion parallax

Occulomotor cues (accommodation, convergence)

Binocular disparity and stereopsis

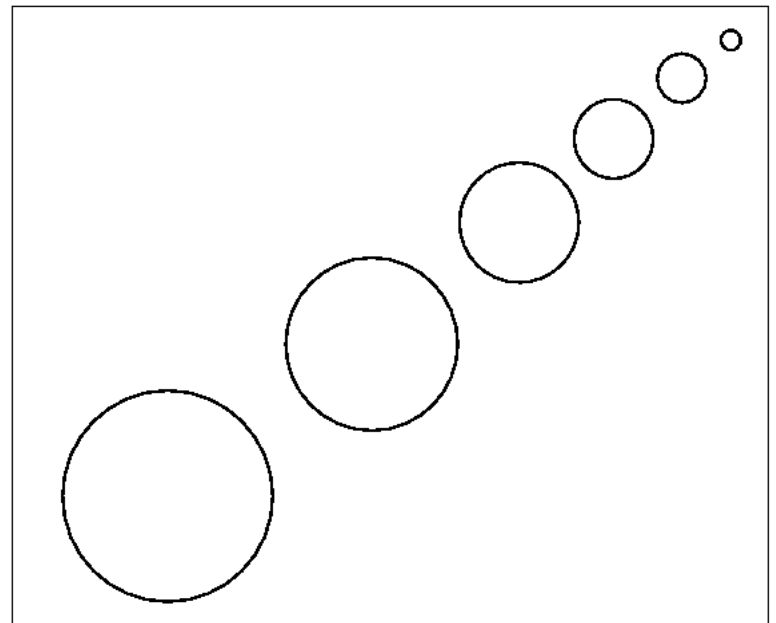
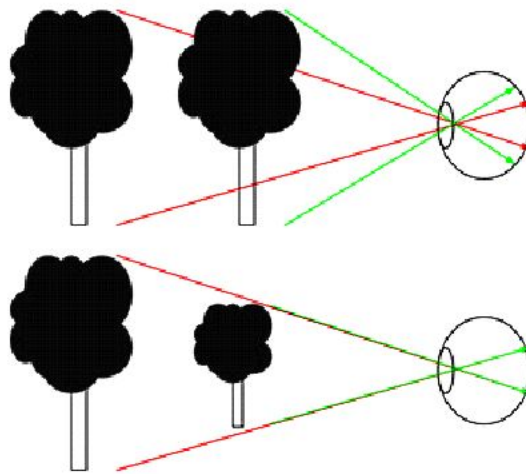
→ All of the above, combined, determine our perception of depth.

Monocular Depth Cues

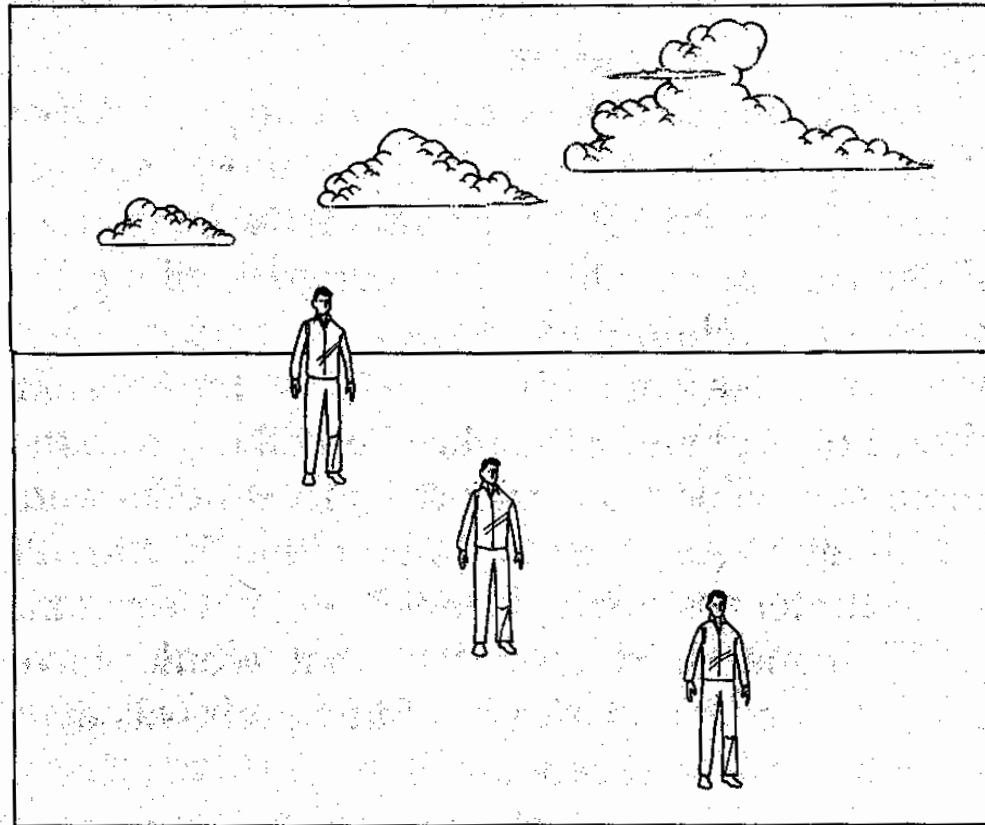
Relative Size

Monocular depth cues

Retinal projection depends on size and distance

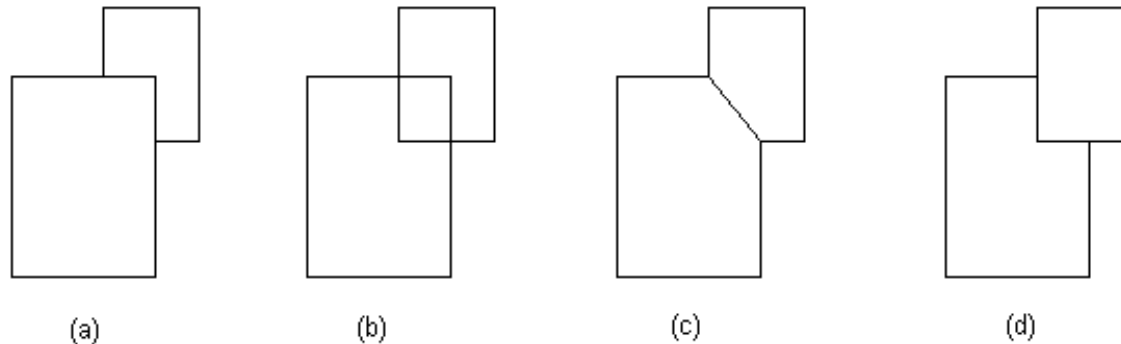


Height relative to horizon



Monocular/Static Cues

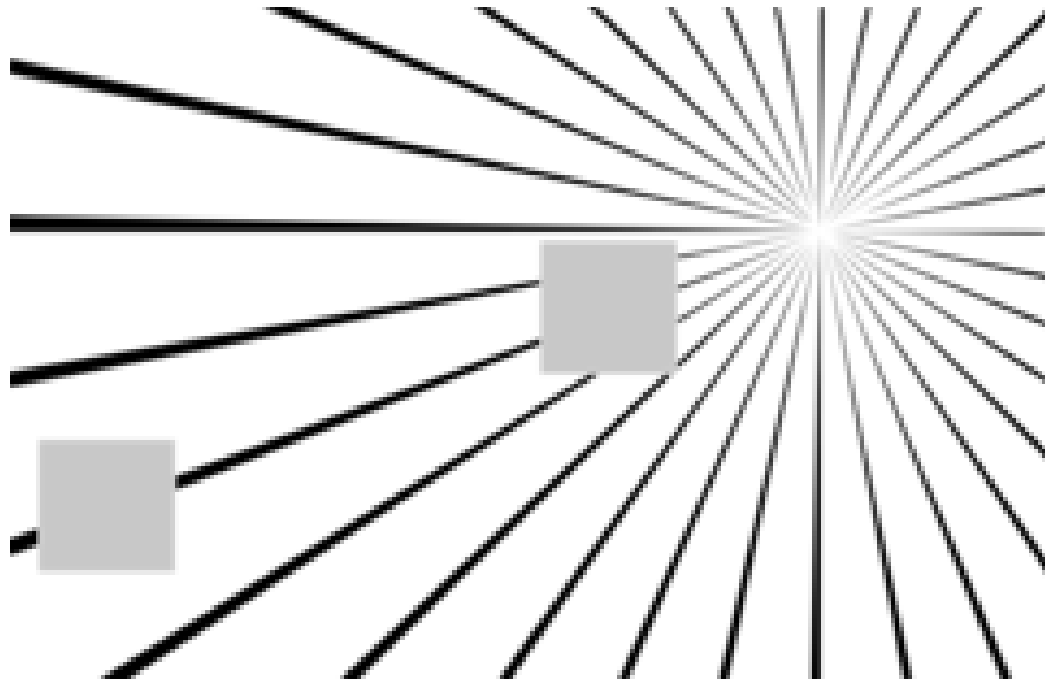
Occlusion



Depth perception based on overlapping. The object with more continuous border line is felt to lie closer. In figure (a) it is the larger rectangle and in figure (d) it is the smaller. In figures (b) and (c) no depth information can be obtained.

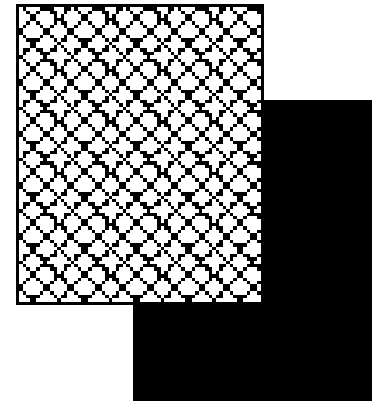
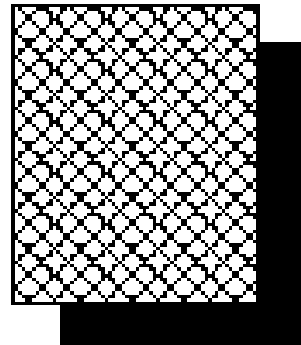
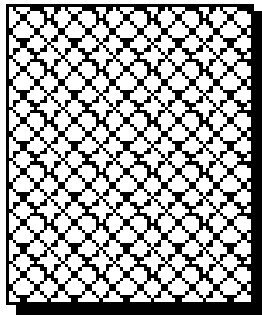
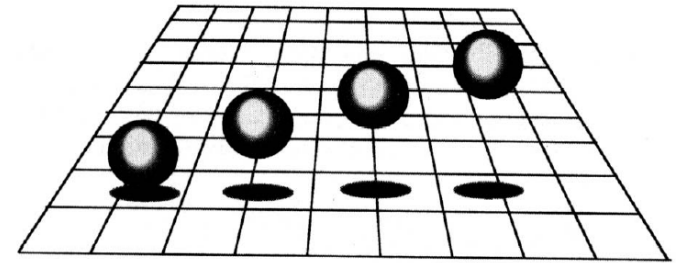
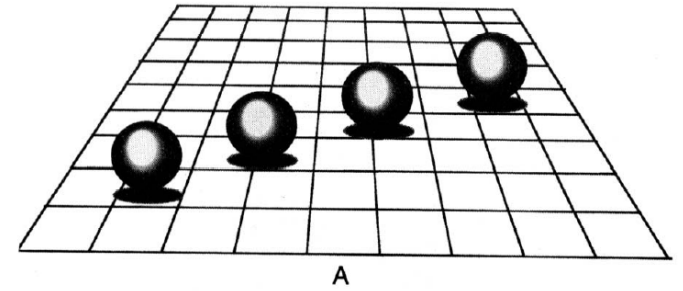
http://www.hitl.washington.edu/projects/knowledge_base/virtual-worlds/EVE/III.A.1.c.DepthCues.html

Linear Perspective



<http://anthonysaba.wikispaces.com/Depth+Perception>

Shadows



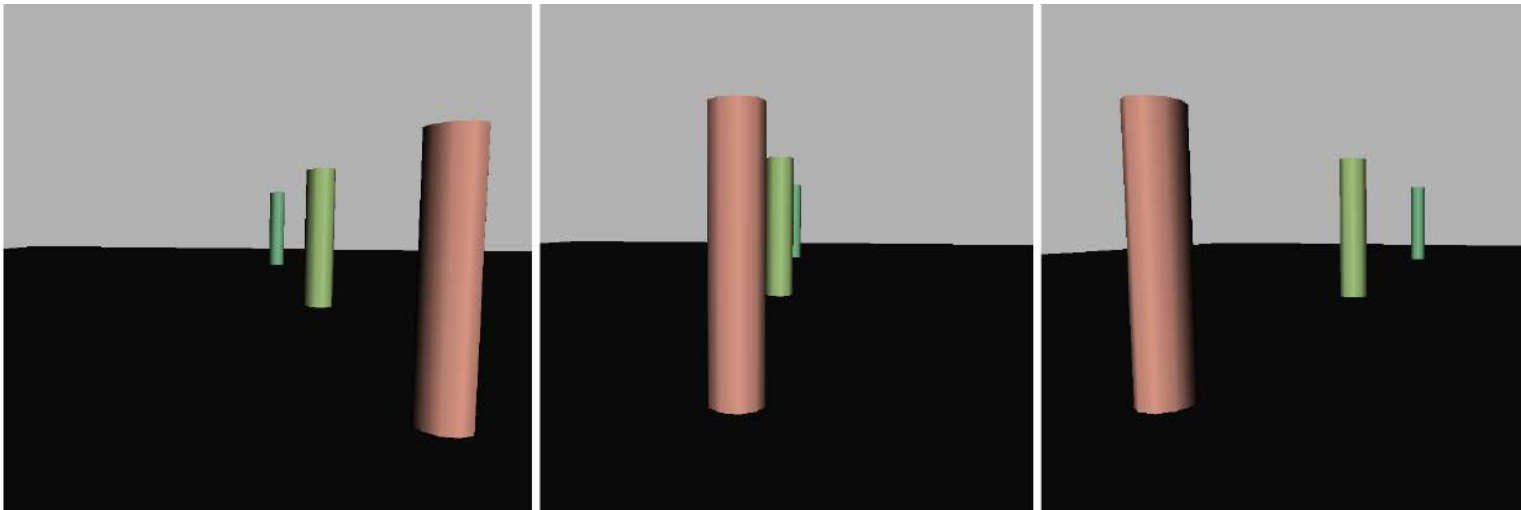
Lighting and Texture



Motion Parallax

Moving viewer

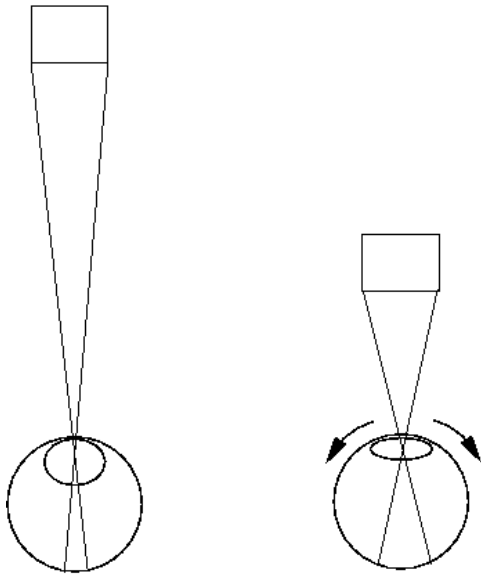
In image sequence below, viewer moves to the right



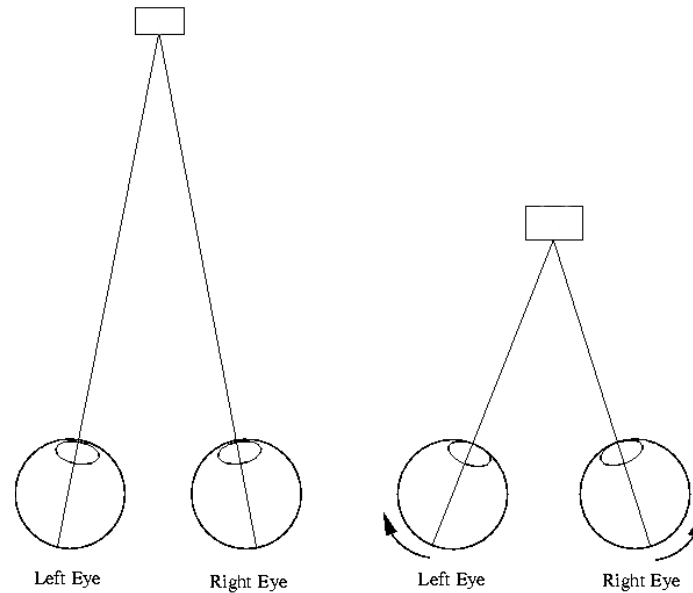
Accommodation

Physical stretching and relaxing of eye lens

Do not confuse with convergence!



Accommodation



Convergence