Perceptual and Artistic Principles for Effective Computer Depiction
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Introduction

• Different views on picture making
  – Perception & cognition
  – Artistic practice
  – Computer graphics

• Connections between these fields

• Not directly an “how-to” course

• Not a reduction of Art
Art and Science

• Music
  – Psychoacoustics, harmony, musical scales, etc.

• Language
  – Grammar, linguistic, etc.

• Do not ruin the beauty of symphonies & poems

• Science provides insights, structure, context,

• But there is always some remaining magic and genius.
One-way image generation

- From 3D to 2D
- Optical simulation or recording

Real scene:
- 3D geometry
- Material
- Light

Image
Depiction is actually more complex

Real scene (possibly imaginary)

Picture

Perception & Cognition
Message, goal
Speakers

• We are computer scientists
• We use perception & cognition knowledge
• We try to learn from artists

• Maneesh Agrawala, Stanford University
• Frédo Durand, MIT
• Bruce Gooch, University of Utah
• Victoria Interrante, University of Minnesota
• Victor Ostromoukhov, University of Montreal
• Denis Zorin, New York University
Overcoming the limitations of the medium

• 8:40 Limitations of the medium (Durand)

• 9:25 Perception & representation of shape and depth (Interrante)
Color and Perspective

- 10:35 Color (Ostromoukhov)

- 11:25 Perspective and perception (Zorin)
Picture composition and organization

• 1:30 Focus and gaze (Durand)
• 1:55 Gestalt and composition (Durand)
• 2:35 Neurological theories of aesthetic (Gooch)
Beyond projection

- 3:35 Computational vision and pictures (Durand)

- 4:25 Effective visualization and illustration using cognitive science (Agrawala)
Please share your knowledge
Coming soon…

- Web page: http://gfx.lcs.mit.edu/ArtScience02/
- Latest version of slides
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"Hey! What's this, Higgins? Physics equations?... Do you enjoy your job here as a cartoonist, Higgins?"
An example: color

- Blue & yellow are *opponent* in the visual system
- Van Gogh’s painting uses this effect
- The existence of color opponents has implications in visualization and color technology