Intro to Computer Graphics
Today

• Logistics
• Motivation, topics, projects
• Displays and framebuffers
Logistics

• Instructor:
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• TAs:
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  – Francis Ge
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• Webpage:
Why graphics?
Shadows
Different material properties
Model of the body
Moving arms, legs
Model hair
Weather effects
…
Facial animation in movies

The Story of Benjamin Button
Capturing facial shapes with Light Stage
RGBD (kinect) → animation

FaceShift
Animation from Internet photos
3D animation
Topics of our class
Displays

On State

Off State

Transparent Conductor

Polarizer

Nematic Liquid Crystal

Transparent Conductor
Image processing
Geometric transformations

- Model space (Object space)
  - Scale, translate, rotate, ...

- World space (Object space)
  - Rotate, translate

- Eye space (View space)

- Normalized device space (Screen space)
  - Scale

- Image space (Window space)
  - (Raster space)
  - (Screen space)
  - (Device space)

- Projective transformation, scale, translate

- Normalized projection space

Diagram showing the transformation process from model space to image space through various spaces and transformations.
Hierarchical modeling
Shading

Plastic  Metal
Ray tracing
Curves
Surfaces

(a-c) Loop's subdivision scheme: control mesh, meshes after 1 and 2 subdivision steps, and smooth limit surface

(c-h) Our piecewise smooth subdivision scheme: tagged control mesh, meshes after 1 and 2 subdivision steps, and piecewise smooth limit surface
Animation

Keyframing and interpolation
Particle systems

Physical simulation with particle systems
Principles of Character Animation
Projects

• Show webpages
• Check out examples from previous year