Final Review
Pre-midterm Material

• Not focus of final
• Some material will appear
Introduction to Animation

- Traditional Animation
- Keyframe Animation
- Interpolating Rotation, e.g., using quaternions
Particle Systems

- Differential equation basics
- How to simulate them
- Angel Ch. 11 (+ Baraff & Witkin notes)
Rasterization

- Scan Conversion of Lines
  - Bresenham’s Algorithm
- Scan Conversion of Polygons
- Antialiasing
- Compositing
- [Angel, Ch. 7.9-7.11, 8.9-8.12]
Image Processing

- Blending
- Display Color Models
- Filters
- Dithering
- Image Compression
Overview of Physically Based Modeling

• Skip
Ray Tracing

- Ray Casting
- Ray-Surface Intersections
- Barycentric Coordinates
- Reflection and Transmission
- Optimizations (from notes)
- [Angel Ch. 13]
Spatial Data Structures

- Hierarchical Bounding Volumes
- Regular Grids
- Octrees
- BSP Trees
- Constructive Solid Geometry (CSG)
- [Angel 9.10]
Radiosity

- Measures of Illumination
- The Radiosity Equation
- Form Factors
- Radiosity Algorithms
- [Angel, Ch 13.4-13.5]
Global Illumination

- Substructuring
- Progressive Refinement
- Bidirectional Reflectance Dist. Fcn.
- Combining Radiosity and Ray Tracing
- [Angel, Ch 13.5]
Non-photorealistic Rendering

- Pen-and-Ink Illustrations
- Painterly Rendering
- Cartoon Shading
- Technical Illustrations
Visualization and Volume Rendering

• Height Fields and Contours
• Scalar Fields
  – Isosurfaces
  – Marching cubes
• Volume Rendering
  – Volume ray tracing
  – Splatting
  – 3D Textures
• Vector Fields
  – Hedgehogs
  – Animated and interactive visualization
• [Angel Ch. 12]