

# Midterm Topics List

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- **Color**

- Eye’s mechanism and perception of color
- Full spectra and our RGB color model
- Additive and Subtractive mixing
- Chromacity and the CIE color space
- Color Phenomenon - reflection, transmission, scattering, etc.

- **Shading**

- Local Shading Phenomenon - what is, what isn’t
- Pointwise Shading
  - \* BRDF - Full, Component-wise and Extended
  - \* Approximate BRDF as used in our shading model (section 3 handout)
  - \* Lambertian (Diffuse) materials
- Surface shading - Phong, Gouraud and Flat Shading

- **Linear Transformations**

- 2D - Scale, Rotate, Shear, Translate
- 3D - Scale, Shear, Translate
- Homogenized Coordinates (2D and 3D)
- 3D Rotations
  - \* Axis-Aligned Rotations
  - \* Euler Angles
  - \* Exponential Maps
  - \* Quaternions

- **Perspective Transforms** (yes, perspective transforms often are linear transforms)

- What is it? It is present in Raytracing? Scan Conversion?
- Linear Projection
- Orthogonal Projection
- Canonical View Space - “placing your eye at an arbitrary position and direction”
- Perspective Projection
  - \* Theory
  - \* Vanishing Points
  - \* Visual Tricks
  - \* Depth Distortion

- **Raytracing**

- Why Raytracing? What can we model with it, what can’t we? What is expensive, what is cheap?
- General Algorithm
  - \* Different “kinds” of rays - shadow, reflection, etc - and how we incorporate them.
  - \* Intersection tests - sphere and triangle.
- Extra additions - soft shadows, area lights, motion blur, DoF, etc.
- Speedup Structures and BSPs - Know how to build and traverse BSPs on paper!