The Ray Tracer Code

CS-445, Fall 2012
Main Components

- **main** - Starting point of program
  - Contains the GLUT windowing commands
  - Contains pointers to Objects:
    - **Camera**
    - **RenderEngine**
- **RenderEngine** class—performs the rendering calculations!!
  - Has pointer to the **World**
- **Camera** —
  - Location & orientation (uvn), resolution, viewplane size & location
- **World** - hold the assets of the scene:
  - **Camera**, List of shapes, list of lights
  - Pointer to the image array
Scene Assets

• *Shapes*:
  – *GeometryObject* class parent class for shapes
    • Has pointer to the *Material*
  – *Sphere* – inherits from *GeometryObject*
    • Knows how to compute hit point:
      – intersection of ray with itself
    • Knows how to calculate the normal at hit point
• *Material* – holds surface properties of shapes
  – Color, reflection coefficients, specularity
• *PointLight* – hold light properties
  – Color, intensity, location
Utility Classes

- **RBGColor** - stores rgb color
- **Vector3D** – store xyz. Can represent
  - Vectors, points
- **Ray** – stores ray properties
  - Starting point, direction
- **ShadeRec** – convenience class for storing hit point properties
  - Location, normal, Material, tmin (ray parameter)
- **Constants** – holds global constants