

# CSCI-4962: Three-Dimensional Computer Graphics

Class 22: November 11, 2002

## Visible Surface Detection, Ray Tracing

### Today's Class

We will first complete our discussion of *visible surface detection*.

1. Binary space partition trees
2. Octrees
3. Ray casting

We will then look at *Ray Tracing*, which is a popular global illumination method for rendering images with shadows, transparent surfaces, etc.

1. Ray tracing: forward ray tracing, recursive ray tracing
2. Recursive ray tracing algorithm
3. Intersection computations for ray tracing, and efficiency issues

### Reading

Chapter 8.8 (visible surface detection) and Chapter 13.1–13.3 (ray tracing) of the Angel textbook. Read <http://www.bluesnews.com/abrash/chap64.shtml> for a description of the use of BSP trees in Quake.

For a description of techniques used in “Fiat Lux”, see <http://www.debevec.org/FiatLux/> and <http://www.cs.berkeley.edu/~debevec/Items/NewScientist/>.

### Activity

Download and play with the POV-Ray ray tracer at [www.povray.org](http://www.povray.org).

### Next Class

Fractals.