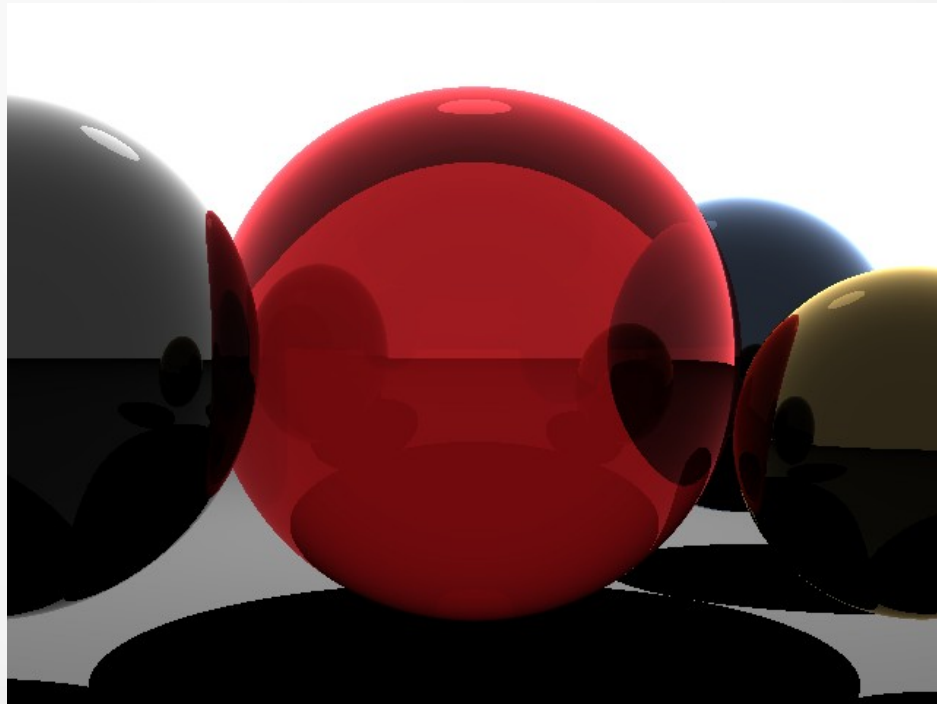
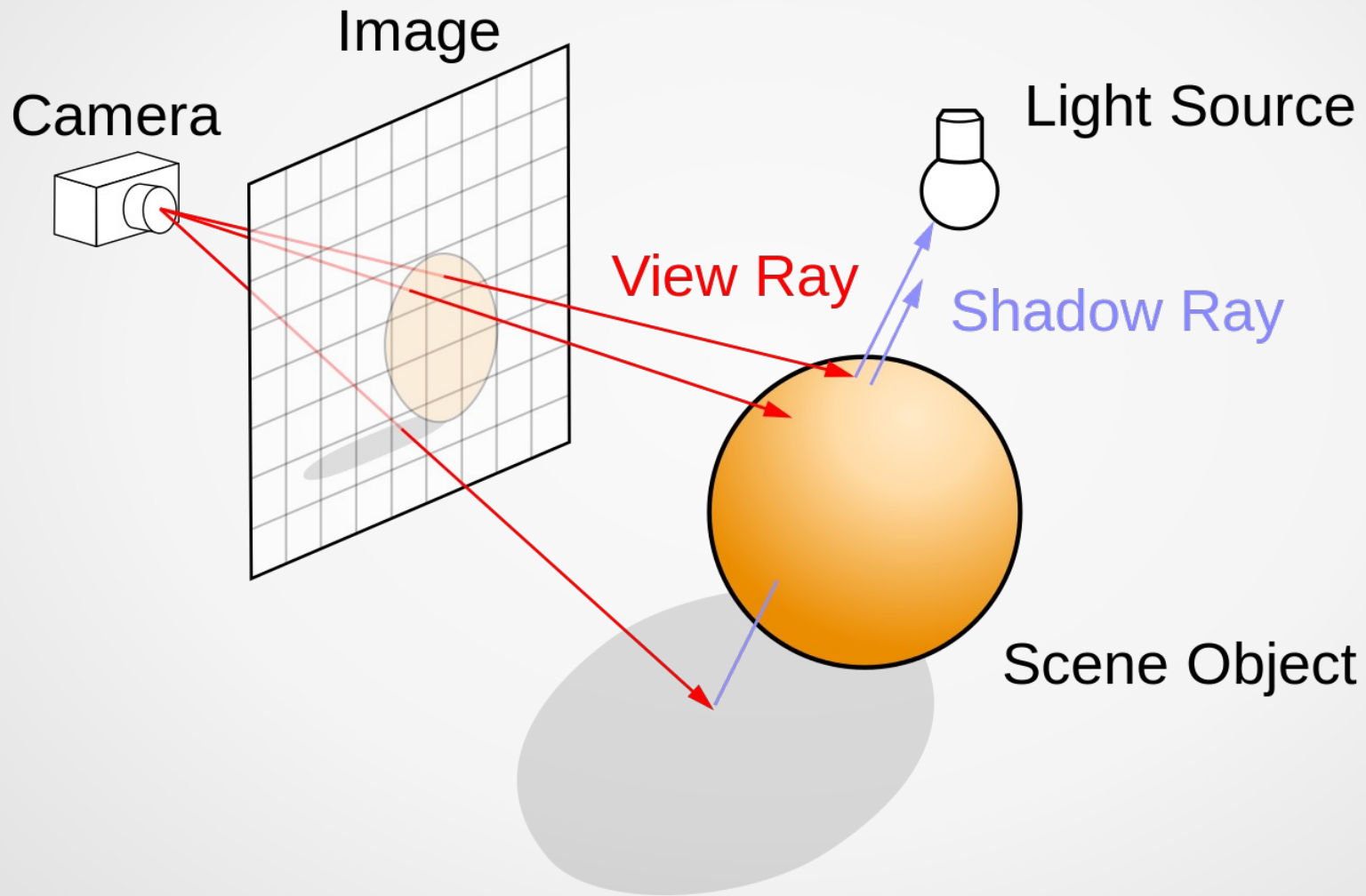


Testing Ray Tracers

Brian Labrum



Ray tracing



Ray test generator

- Clip space
- disabled lighting
- test (test number)(args)
- 512x512 image
- Fov 45

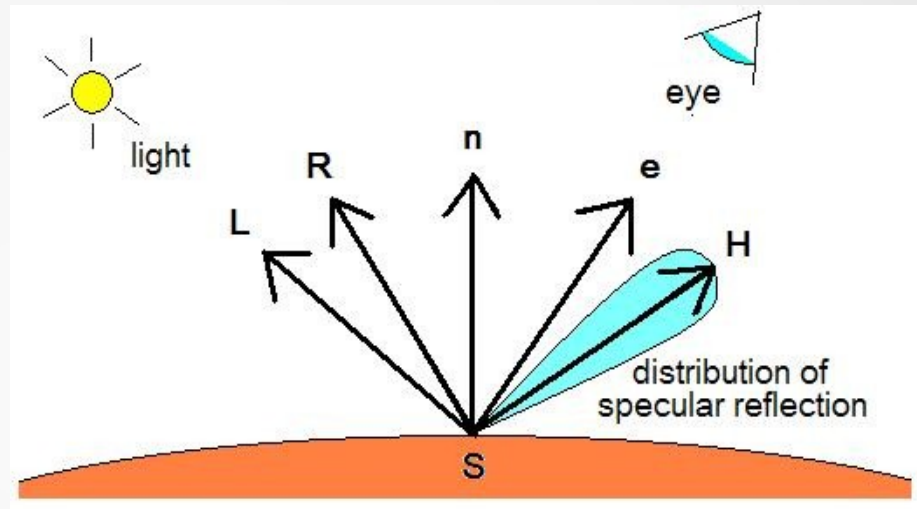


image resolution 512 x 512

s1 location<-0.4687500000000000,-0.4687500000000000,-20> color<1.0,0.0,0.0> radius 5

s2 location<-0.2343750000000000,-0.2343750000000000,-10> color<0.0,1.0,0.0> radius
0.00351562490686774

(250,262) <0.0,1.0,0.0>

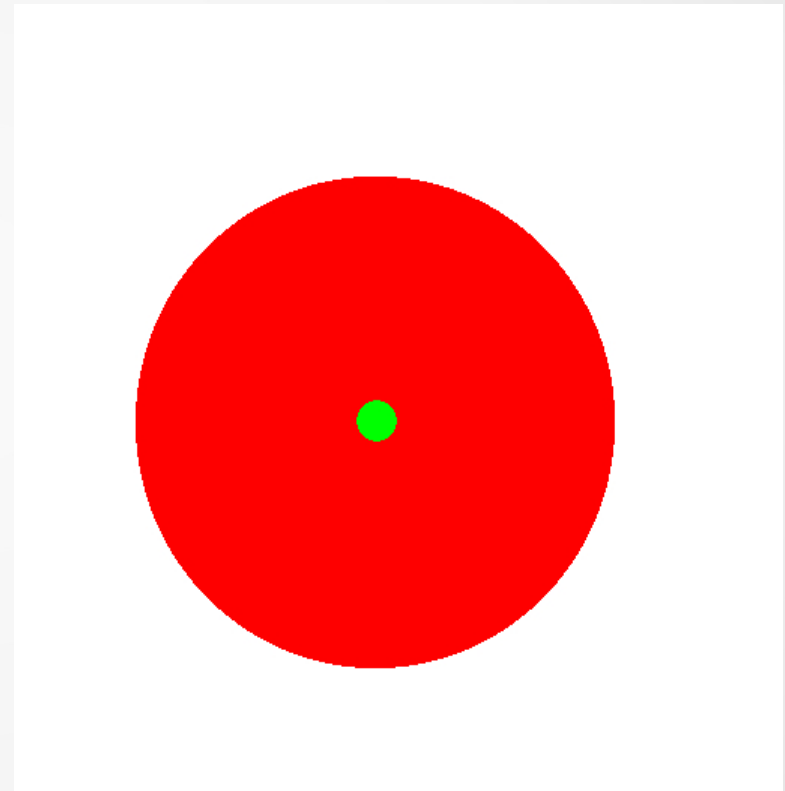
Pixel color checker

- Checks if pixel is correct color
- Takes file location and pixel coordinates
- Only checks if pixel is green

Test 1 two spheres

- Test generates 2 spheres 1 large the other small
- Takes in scale value p for smaller sphere where

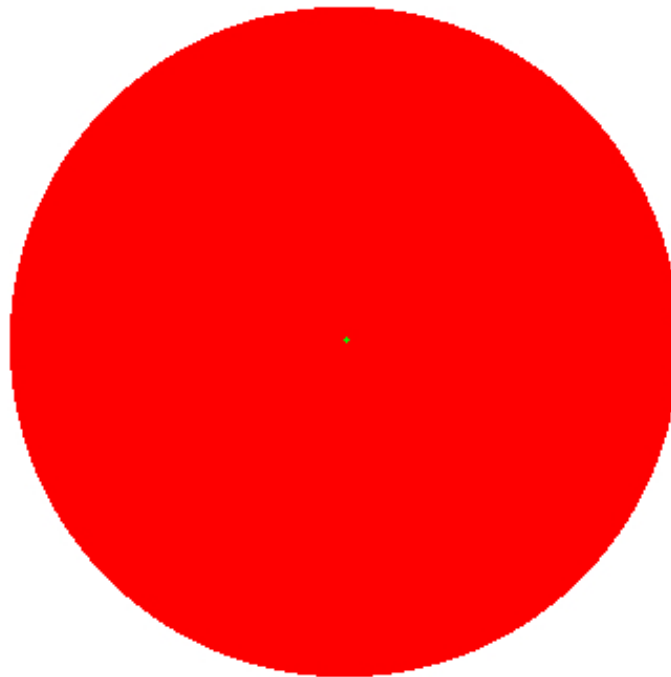
Test 1 (float p)



Test 1 results

C++ tracer

P =	Pixel check	visible
55	y	y
50	n	y
5	n	y
1	n	y
.5	n	n



Test 2 distant sphere

- Test generates one sphere
- Takes in distance value d that determines how far away sphere is
- test 2 (int d)



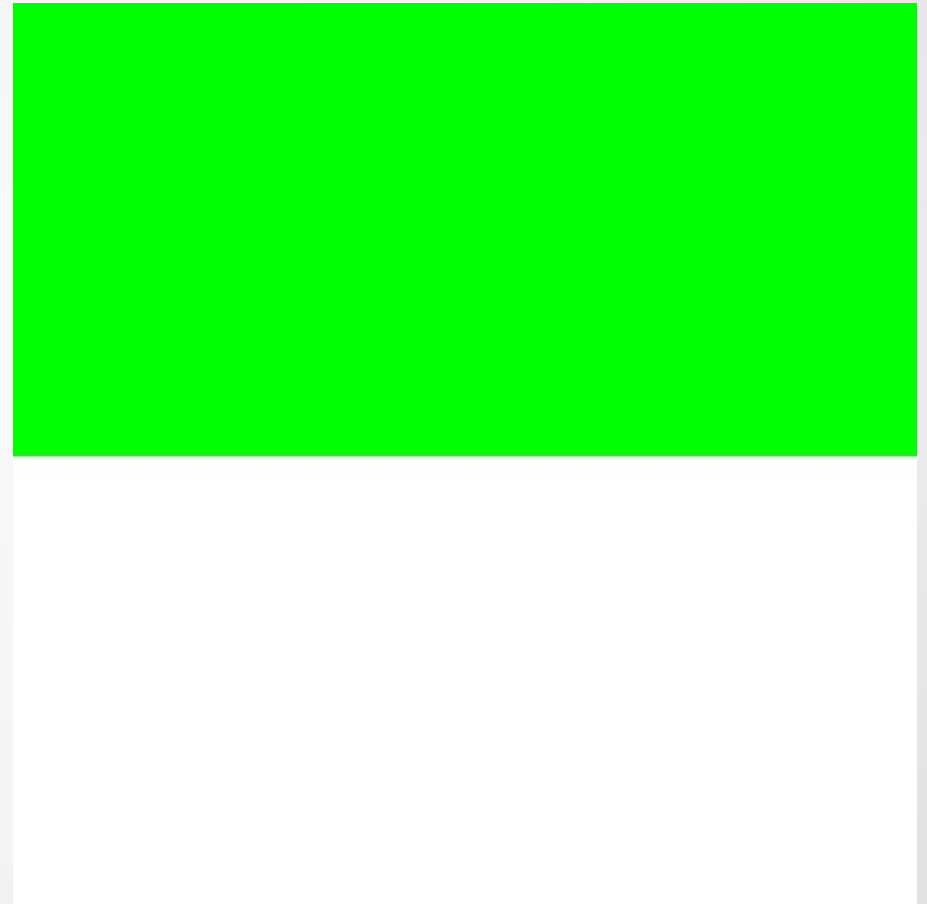
Test 2 results

C++ tracer

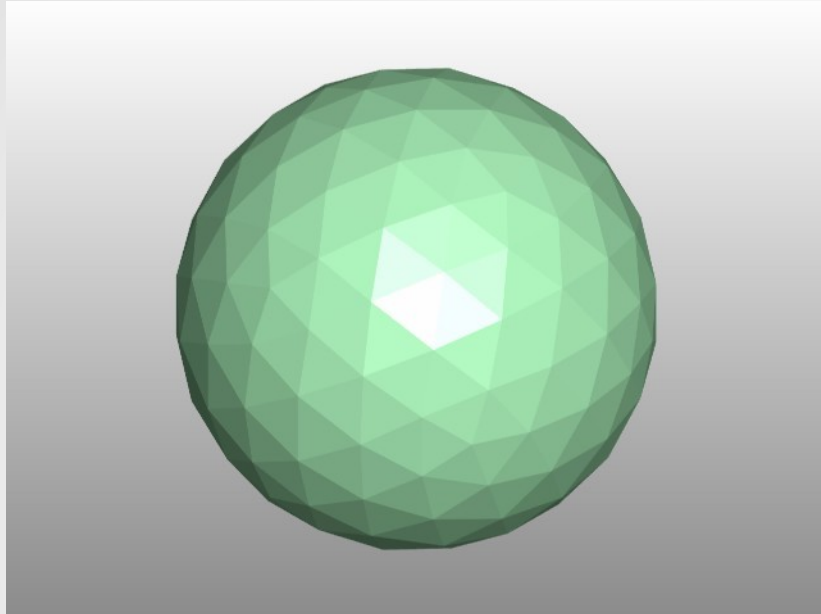
d =	Pixel check	visible
100	y	y
125	n	y
500	n	y
1250	n	y
1300	n	n

Test 3 sphere edge

- Test generates one sphere
- Takes in distance value p that determines how large the sphere is
- test 3 (float p)



Guaranteed to fail

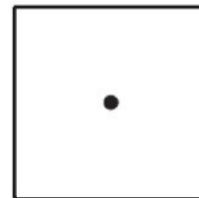


CS 354

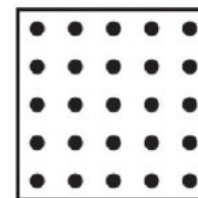
50

Ray Tracing Quality

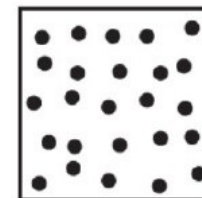
- Aliasing is a problem in ray tracing
 - Spatial and temporal
- Spatial anti-aliasing
 - Average over several samples per pixel



1 sample



5x5 grid



5x5 jittered grid

What's next

- Arbitrary image resolution
- Nested spheres
- Reflections
- Refraction
- generate multiple tests at once

Useful?

