

# MIPSRAY: A Ray Tracer

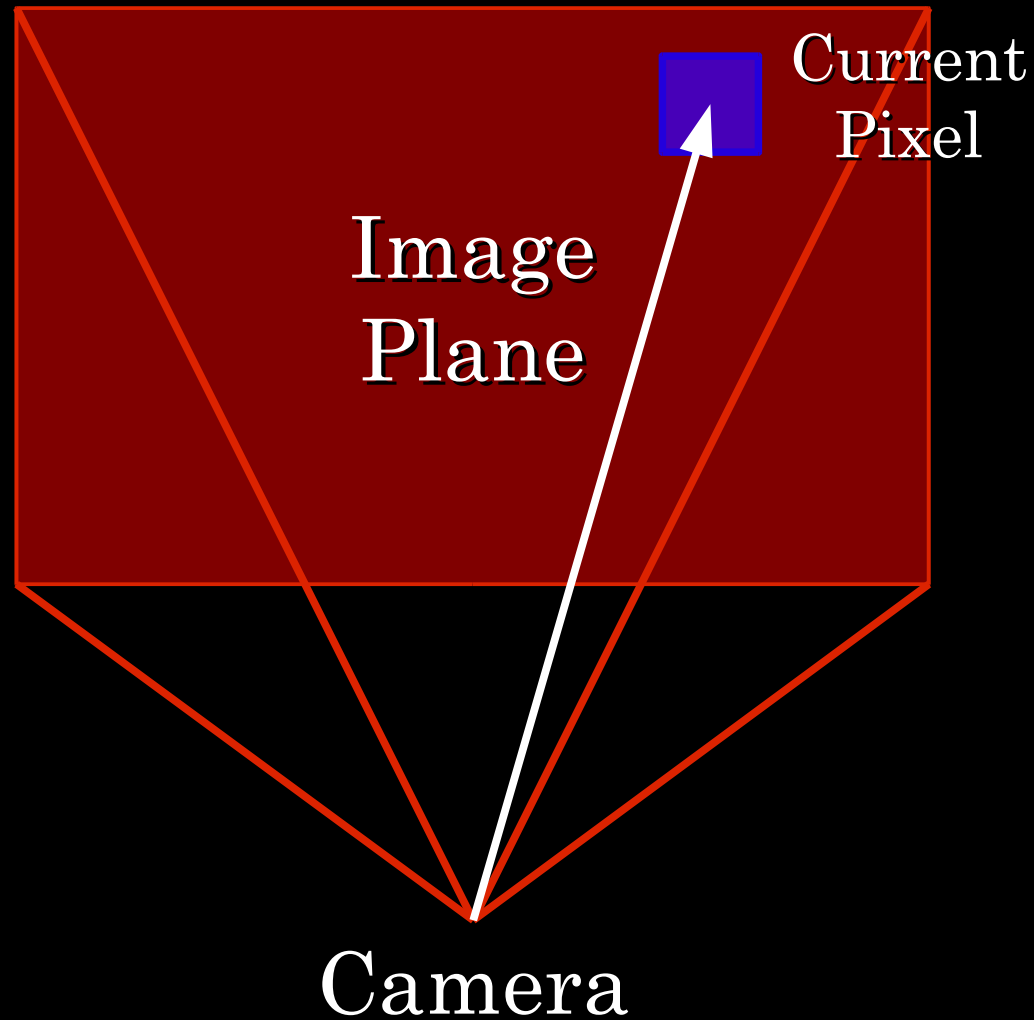
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EECS 314: Computer Architecture



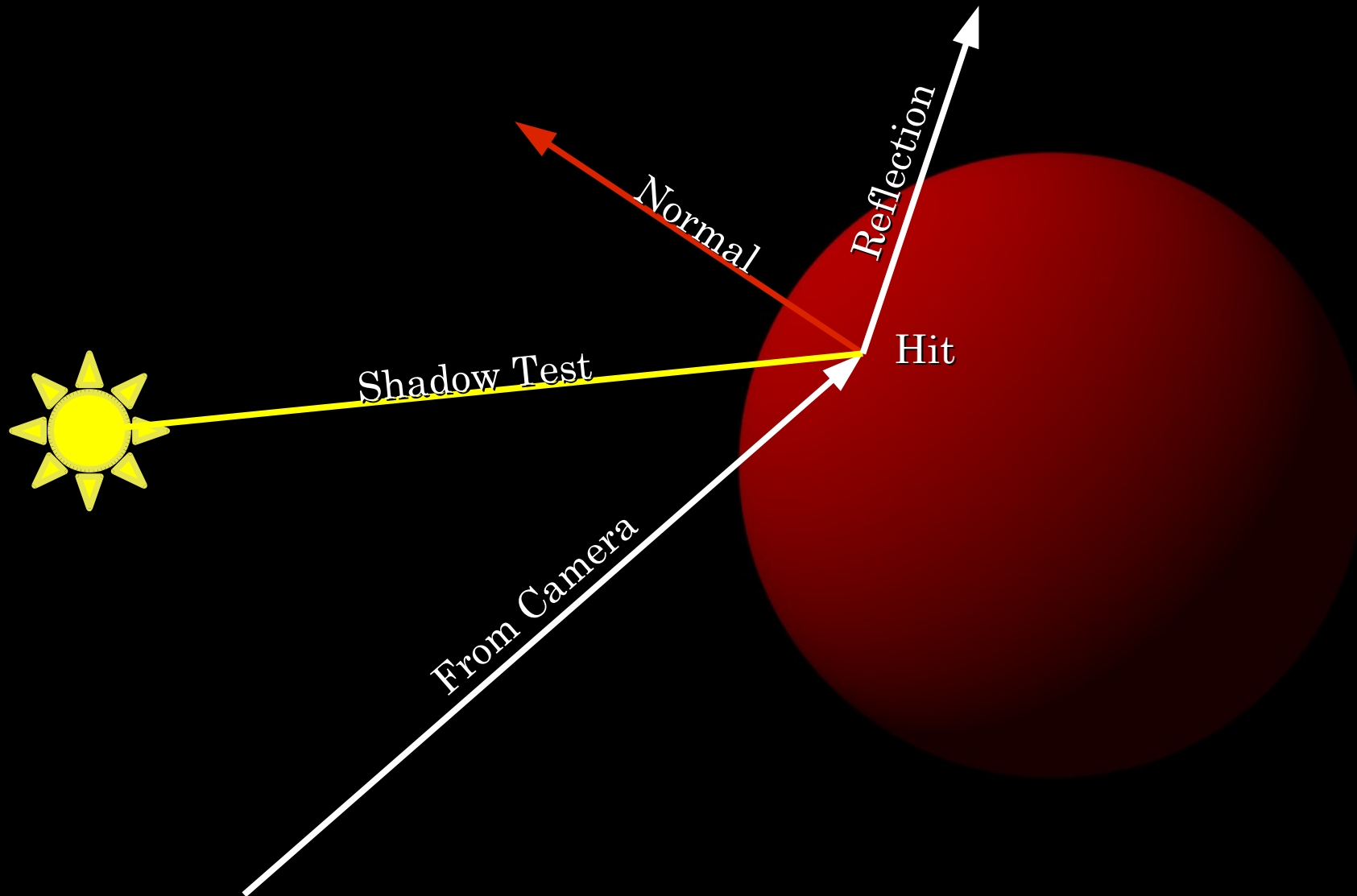
# Ray Tracer Overview



# The Camera Ray



# The Ray Tracing Algorithm



# The Ray Tracing Algorithm

Start with a ray...

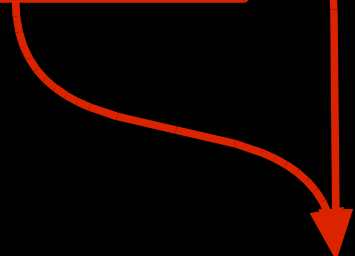
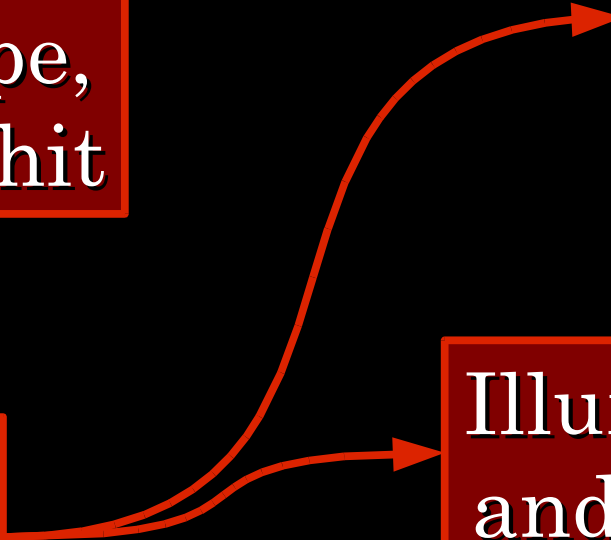
For each shape,  
Compute the hit

Take the  
closest hit

Recursive call  
for reflect/refract

Illuminate  
and shade

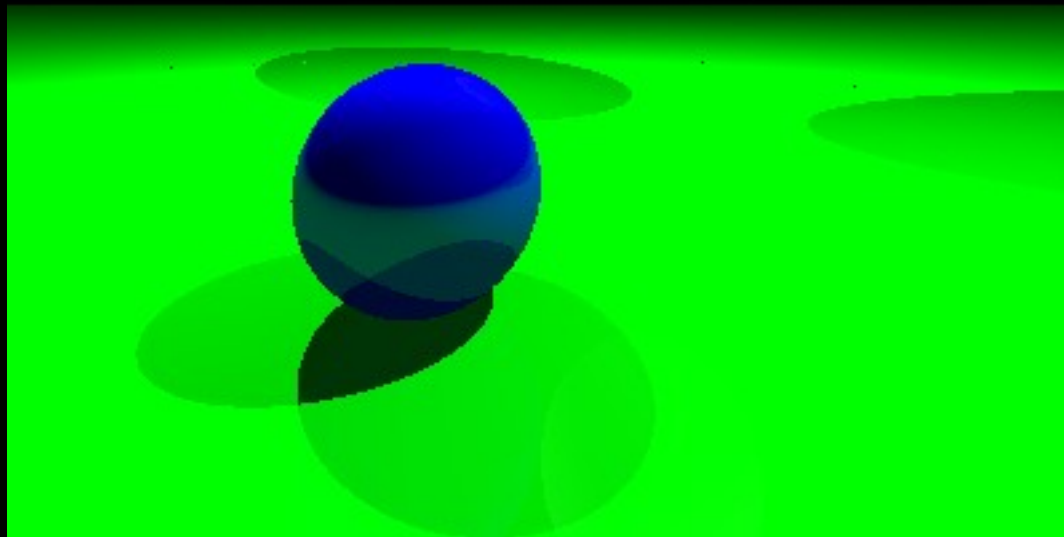
...and return a color



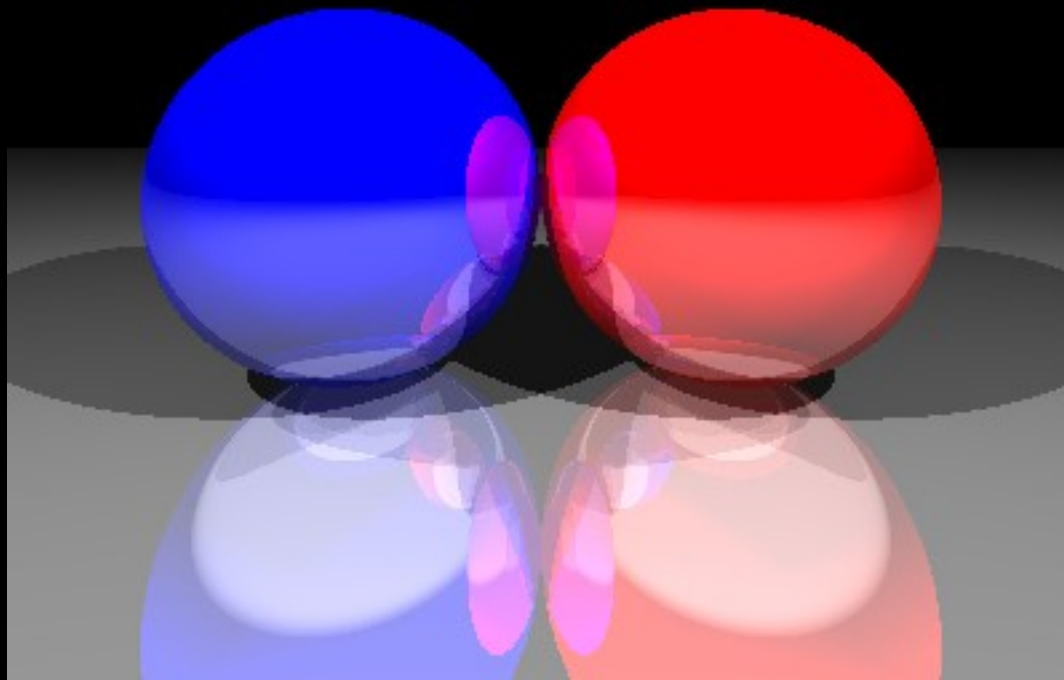
# Implementation Challenges

- Repeated vector arithmetic
  - Module (add, subtract, scalar, cross, dot, norm)
- Root solvers (linear, quadratic)
- Shape solvers (sphere, plane)
- BMP file format
- Debugging

# Time for pictures



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