RAY TRACING

SUBSYSTEMS IN THE PROJECT

01 3D OBJECTS

02 VIRTUAL CAMERA AND RAYS

03 REFLECTIONS

04 RENDERING

05 PARALLELIZING

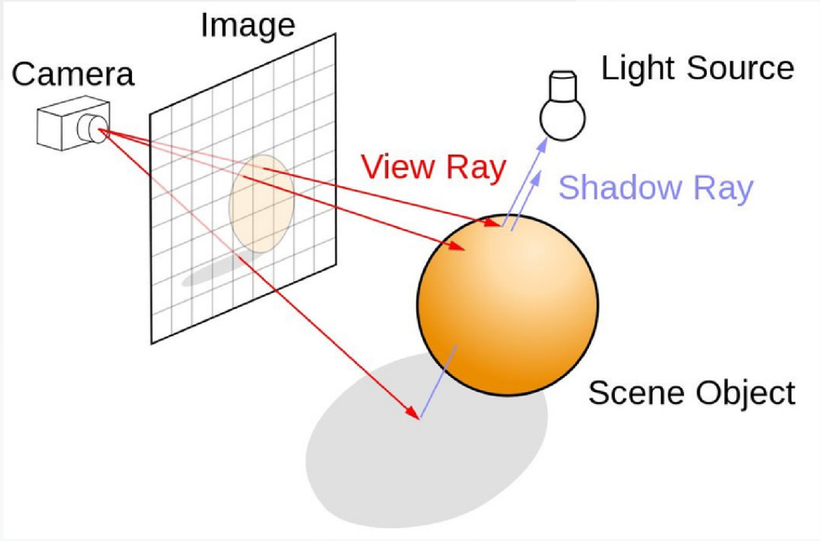
OBJECTS

Three sub-modules will be there:
1) Structure: Defining properties such as radius and centre for a shape.
2) Material: Colour, Emission, Smoothness
3) Collision: Function to calculation collision given a Ray

CAMERAS AND RAYS

The camera will be the origin of rays.

- Camera properties are its location, direction and FOV
- Ray's properties are its origin and direction



REFLECTION

Two types of reflections are there:
1) Diffuse Reflection: Ray bounces in random direction as the surface is not reflective.
2) Specular Reflection: Rays bounce from the surface like its a mirror, reflective angle same as incident angle.

RENDERING

Shooting rays through each pixel multiple times and taking an average of that. Shooting multiple times reduces the noise in the image.

PARALLELIZING

This algorithm is computationally intensive so parallelizing is the first step to optimise this code. Since each pixel shoots its own rays, we can easily parallelize this by distributing work among multiple processors

FUTURE IDEAS

01 MESHED 3D OBJECTS

02 LENSES, REFRACTIONS, SUB SURFACE REFLECTION

03 FOCUS/BLUR EFFECT

04 ADVANCE OPTIMIZATION TECHNIQUES