Raytracing

PPM Format

Aspect Ratio

Image Sizes

Viewport Size

The rays themselves

Find the top left corner of the image, then find the delta vector to the next pixel over on both x and y axis. Using these delta vectors cast a ray into the scene, if it hits something, recursively create a ray to accumulate color.

On impact the ray can behave according to the surface type, three types are explored here, Diffuse, Metallic, and Dielectric.

In Diffuse surfaces the rays are scattered randomly, to simulate this , a random vector is created in a hemisphere, pointing outwards to the normal on the point of impact.

For Metallic or Reflective surfaces, the ray is reflected along the normal by adding twice the vector with magnitude twice the component of the incident ray about the normal and the directional of the normal. Fuzzy REflection

For Dielectric or Refractive Surfaces, the ray is refracted about the normal by using Snell’s Law and Shlick Approximation. Total Internal Reflection

Defocu Blur

Additional

Antialiasing

Gamma Correction

Positioning