Ray Tracing

Rendering

What:

渲染是一个将一组对象作为输入并生成一个像素数组作为输出的过程。

Why:

How:

Object-order Rendering：依次考虑每个对象，并为每个对象找到并更新其影响的所有像素。

Image-order rendering：依次考虑每个像素，对于每个像素，找到影响它的所有对象并计算像素值。

Ray tracing

What:

Ray tracing is an image-order algorithm for making renderings of 3D scenes

Why:

How:

A ray tracer works by computing one pixel at a time, and for each pixel the basic

task is to find the object that is seen at that pixel’s position in the image. Each

pixel “looks” in a different direction, and any object that is seen by a pixel must

intersect the viewing ray, a line that emanates from the viewpoint in the direction

that pixel is looking. The particular object we want is the one that intersects

the viewing ray nearest the camera, since it blocks the view of any other objects

behind it. Once that object is found, a shading computation uses the intersection

point, surface normal, and other information (depending on the desired type of

rendering) to determine the color of the pixel.

A basic ray tracer therefore has three parts:

1. ray generation, which computes the origin and direction of each pixel’s

viewing ray based on the camera geometry;

2. ray intersection, which finds the closest object intersecting the viewing ray;

3. shading, which computes the pixel color based on the results of ray intersection.