Methodology

- Ray tracing is guided by the concept that all the objects we see are illuminated by light, which comes from various light sources. Each beam of light that we see goes from a light source, to various objects. We trace light rays backwards from our eyes to various objects to the light’s source. At each intersection between a ray and an object, we simulate the interaction.
- A bounding volume hierarchy and Octree was used to accelerate the rendering process.
- Monte Carlo path tracing and bidirectional path tracing used to approximate the render equation.

Results

- The finished ray tracer is capable of loading objects and meshes into a scene, directing a camera, simulating interactions between light and various materials, and accelerating the rendering speed, also Monte Carlo path tracing and bidirectional path tracing.

GitHub: https://github.com/liura/ray-tracing

References


Acknowledgments

- Prof. Eugene Zhang, Prof. Yue Zhang, Jinta Zheng, Fariba Khan and ASE Saturday Academy.