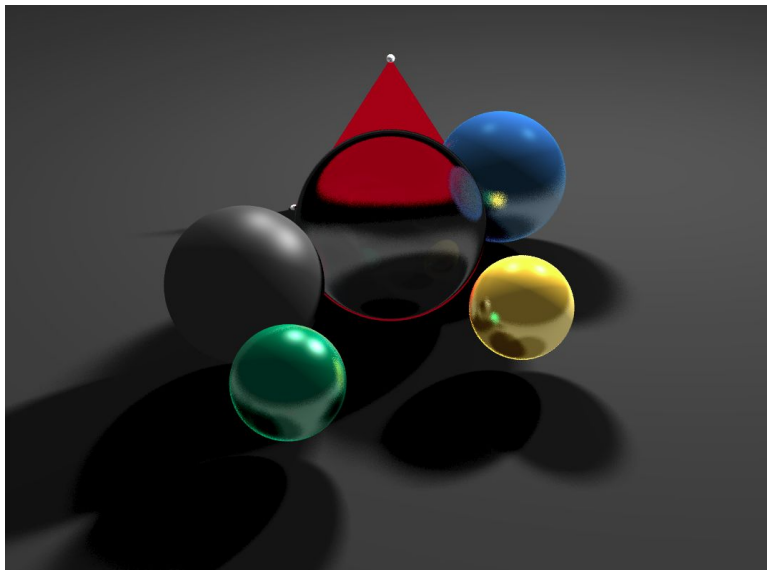


RAYTRACER

Github : <https://github.com/ousan/raytracer.git>

Folder Structure:

- **libraytracer**: includes raytracer library.
 - inc, consists header files
 - src, includes source code
 - lib, includes static library
 - CMakeLists.txt, creates makefile for given library
 - build_library.sh, uses CMakeLists.txt to generate static library
- **bin**: contains binary application.
- **non_ui_example**: includes an application which has no ui, it directly uses libraytracer and sets predefined position and colors.
- **ui**: includes ui implementation which is created by using QT framework.
- **scene_ppm**: example output



Example output

Library Definition:

- raytracer, is interface of this library and includes functionality of this library
- camera, expects position and field of view as angle, it also uses canvas width and height
- canvas, defines height and width of scene
- color, expects RGB values between 0-255
- light, expects position and intensity as vector
- lighting, calculates lighting and shadow
- object is a base class of sphere, triangle, plane classes and shows how to define sub-classes.
- renderer, render the scene with given input
- scene, includes all the objects and lights
- ray, trace the path and it is used determine intersections
- vector3, define coordination of a point on XYZ domain.

Example Input:

MainWindow

Ray Tracer

Canvas Size
Width: Height:

Light
Position: Intensity:

Camera
Position: Fov:

Sphere
Position: Radius: Color:

Triangle
Position a: Position b: Position c: Color:

Requirements vs Implementations:

REQUIREMENTS	STATUS	COMMENT
Define size of rendering canvas.	OK	
Set camera position and up vector.	NOK	field of view is using instead of up vector
Add scene lights defined by position and color.	NOK	Intensity is using instead of color
Planes -- defined by point and vector	NOK	Plane is not implemented
Triangles -- defined by three points	OK	
Spheres -- defined by point and radius	OK	
Desktop application	OK	

References:

- [Tutorial](https://www.scratchapixel.com/lessons/3d-basic-rendering/introduction-to-ray-tracing/ray-tracing-practical-example)
(<https://www.scratchapixel.com/lessons/3d-basic-rendering/introduction-to-ray-tracing/ray-tracing-practical-example>)
- [Example Code from github](https://github.com/michaelmendoza/simple-raytracer)
(<https://github.com/michaelmendoza/simple-raytracer>)