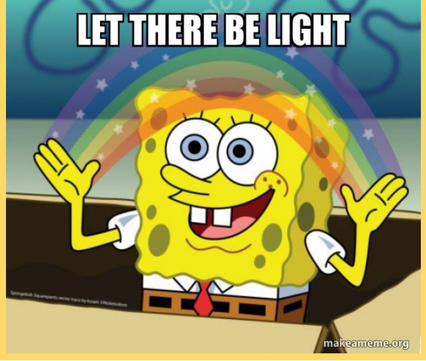


Lit

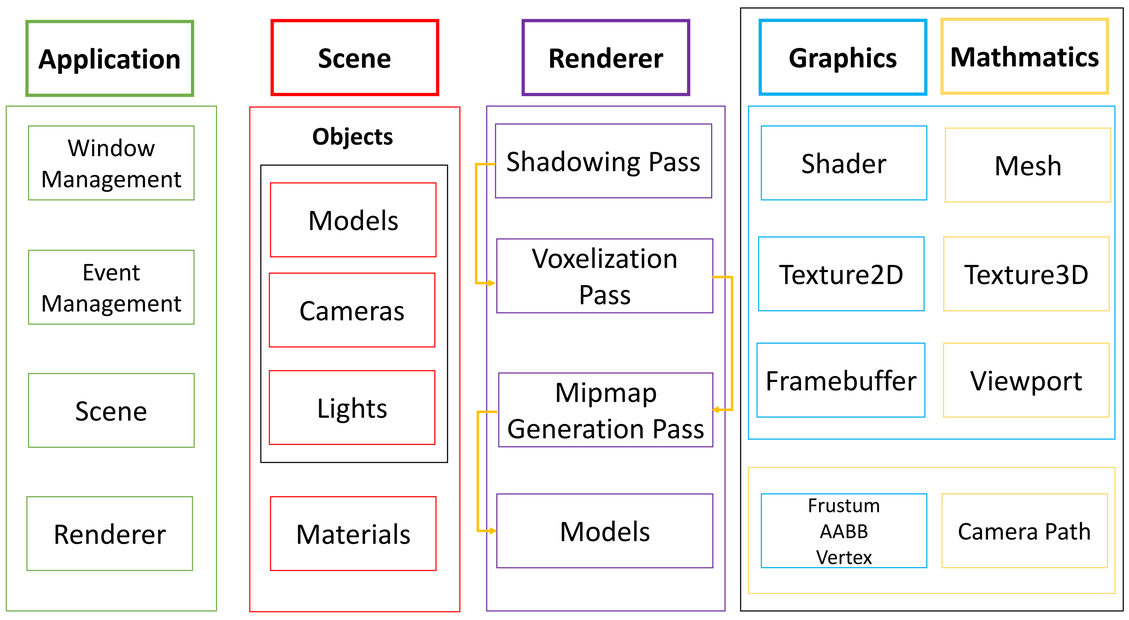
캡스톤 프로젝트 6조 **Lit**
곽상열 양교원

Introduction

- Expressing nature's beauty in a real-time is still challenging issues.
- Global Illumination effect is major component to achieve high quality rendering results.
- Implement renderer to synthesize realistic image in a real-time.

Methods

Framework



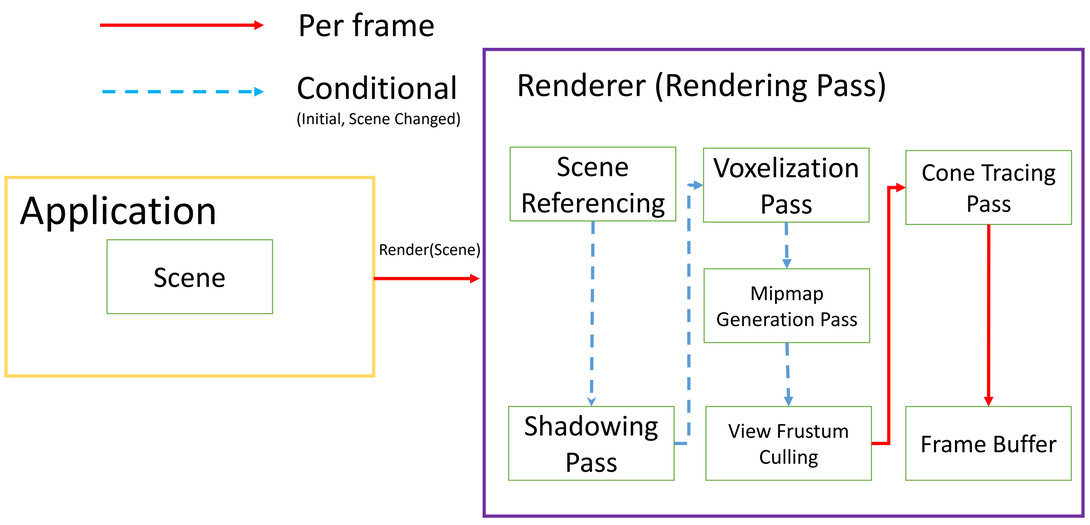
Low Level APIs

Platforms

Windows

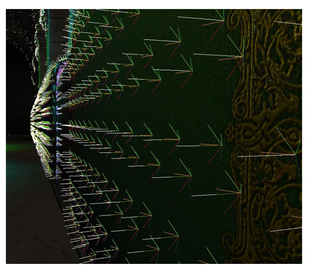
Linux

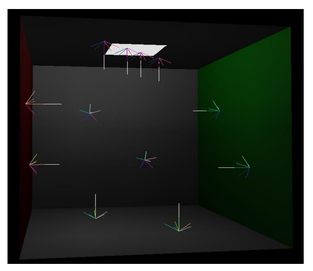
Implementation (Renderer)



Cone Tracing Pass

- Gathering Indirect Lights using Cone Tracing
  - Direct Diffuse : Lambertian DRDFs
  - Direct Specular : Cook-Torrance BRDFs
  - Indirect Diffuse : Trace 6 Cones
    - 60 ° per cone
    - Also compute ambient occlusion
  - Indirect Specular : GGX Importance Sampling
    - Aperture of cone is vary on material roughness
    - 2 ~ 4 Samples to achieve real-time performance
- Linear Attenuation ($Light\ Energy \propto \frac{1}{Distance}$)

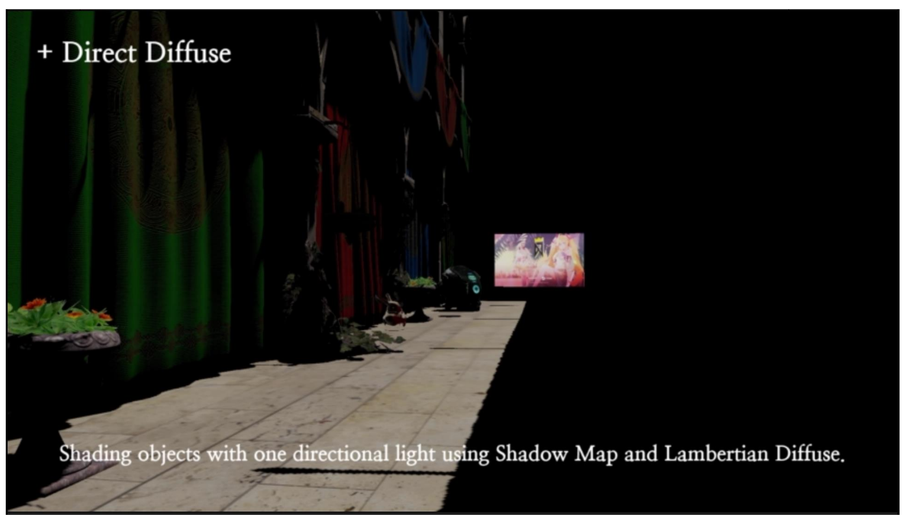




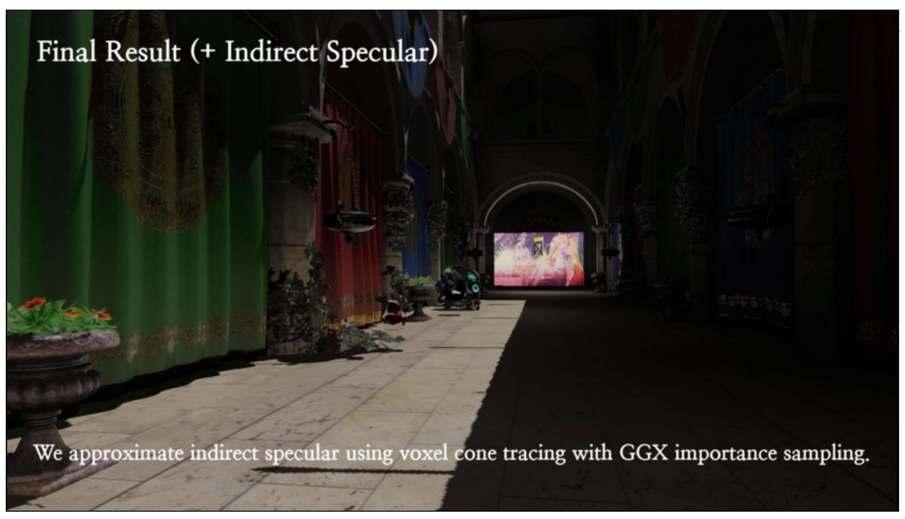
Visualize Diffuse Cone's Directions

Results

Emissive + Direct Diffuse Reflection



Final Result w/ Indirect Specular Reflection



Conclusion

- With our renderer we can achieve our goal to implement Global Illumination effect.
- But we still can extend indirect light bounces and improve voxelization method.
- Also, we can implement post-process effect and find more flexible and physically plausible BSDFs.