

DXR Photon Mapper

Milestone 2

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Goals

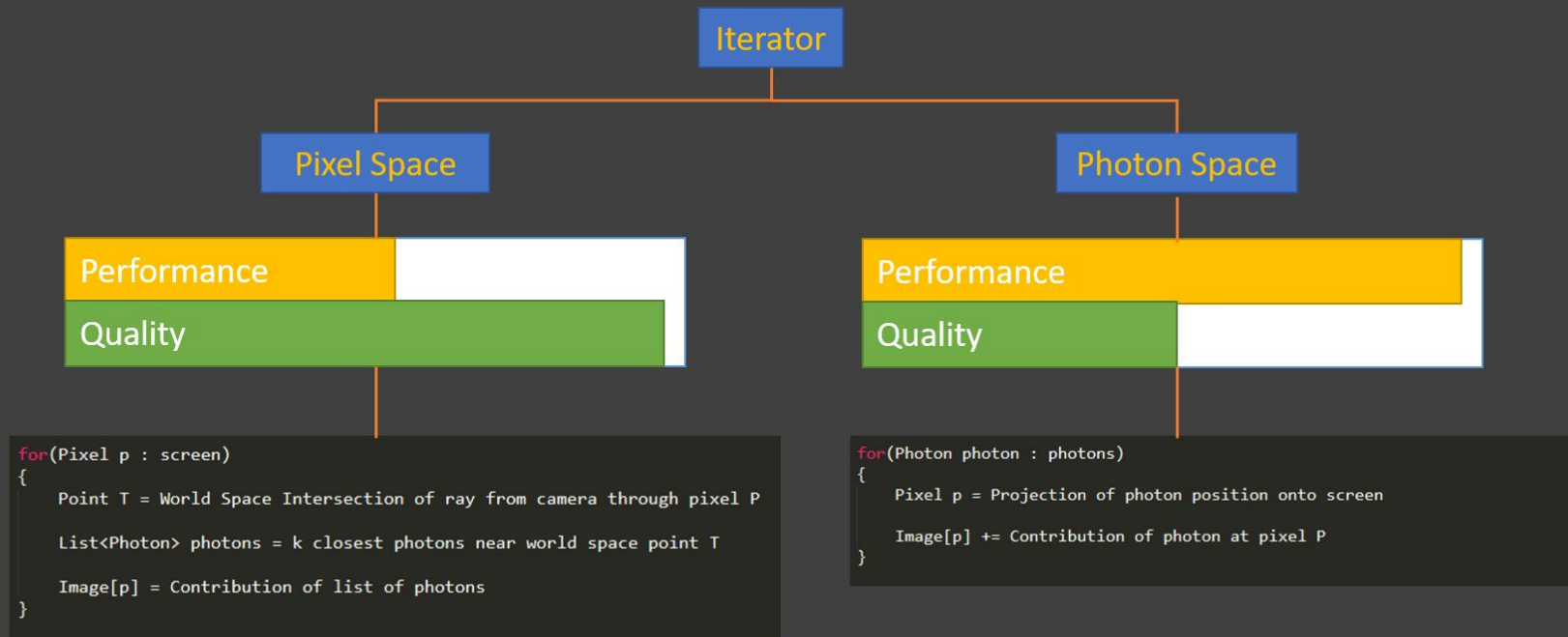
Expectations

- 1) Implementation of Spatial Data Structure
- 2) Basic Photon Generation

Achievements

- 1) Construction of common, efficient data storage across all render passes.
- 2) Multi Pass Render System
- 3) Photon Generation and Propagation
- 4) Naive pixel iterator photon rendering
- 5) Photon major iterator rendering

Pixel Major vs Photon Major Iterator



Pixel Major

Pixel Major Iterator Renderer

once per scene

Photon Generation
and Traversal

every frame

Final Gather

Ray Dispatch
Parameters

Width :

$\text{sqrt}(\text{numPhotons})$

Height :

$\text{sqrt}(\text{numPhotons})$

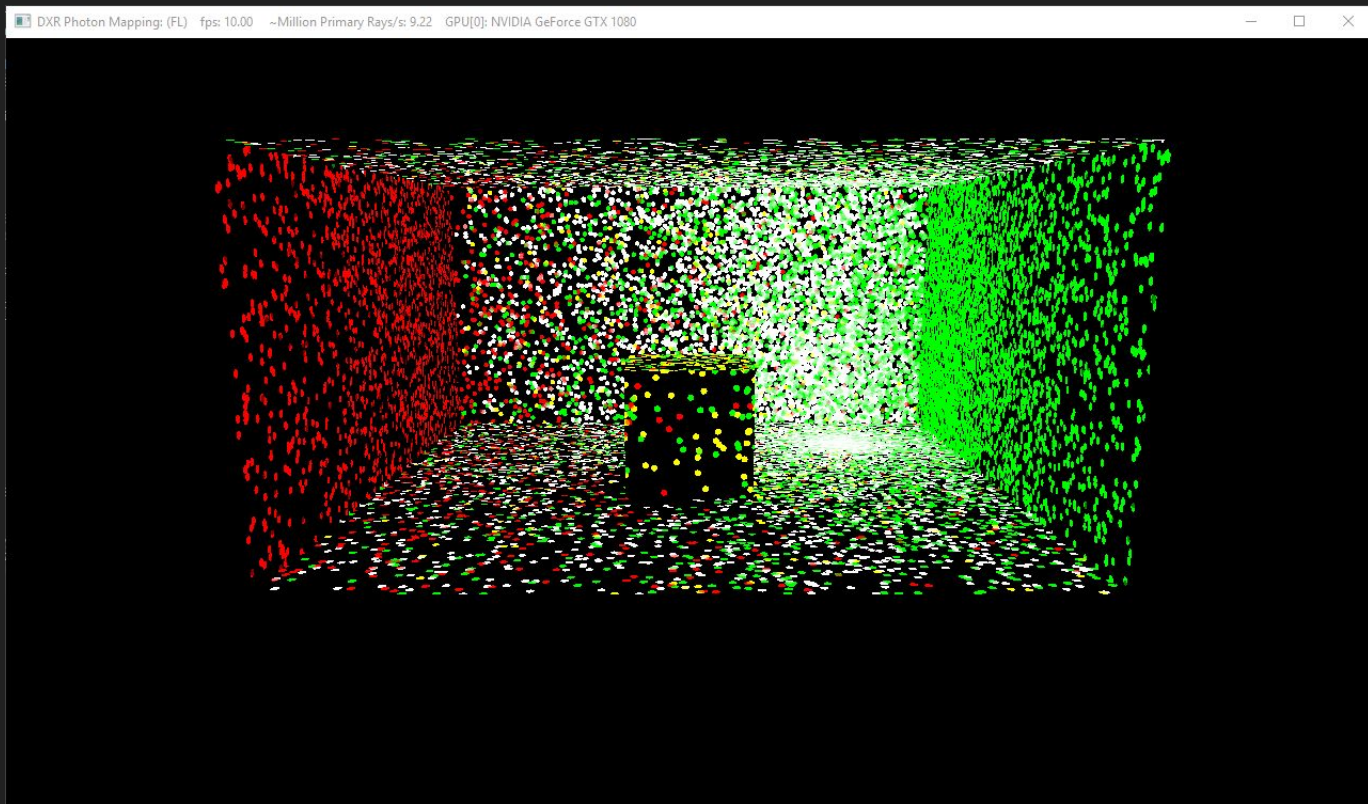
Depth : MaxBounces

Width : ScreenWidth

Height : ScreenHeight

Depth : 1

Pixel Major



Photon Major

Photon Major Iterator Renderer

once per scene

Photon Generation
and Traversal

every frame

Screen Mapping

Final Gather

Ray Dispatch
Parameters

Width :

$\sqrt{\text{numPhotons}}$

Height :

$\sqrt{\text{numPhotons}}$

Depth : MaxBounces

Width :

$\sqrt{\text{numPhotons}}$

Height :

$\sqrt{\text{numPhotons}}$

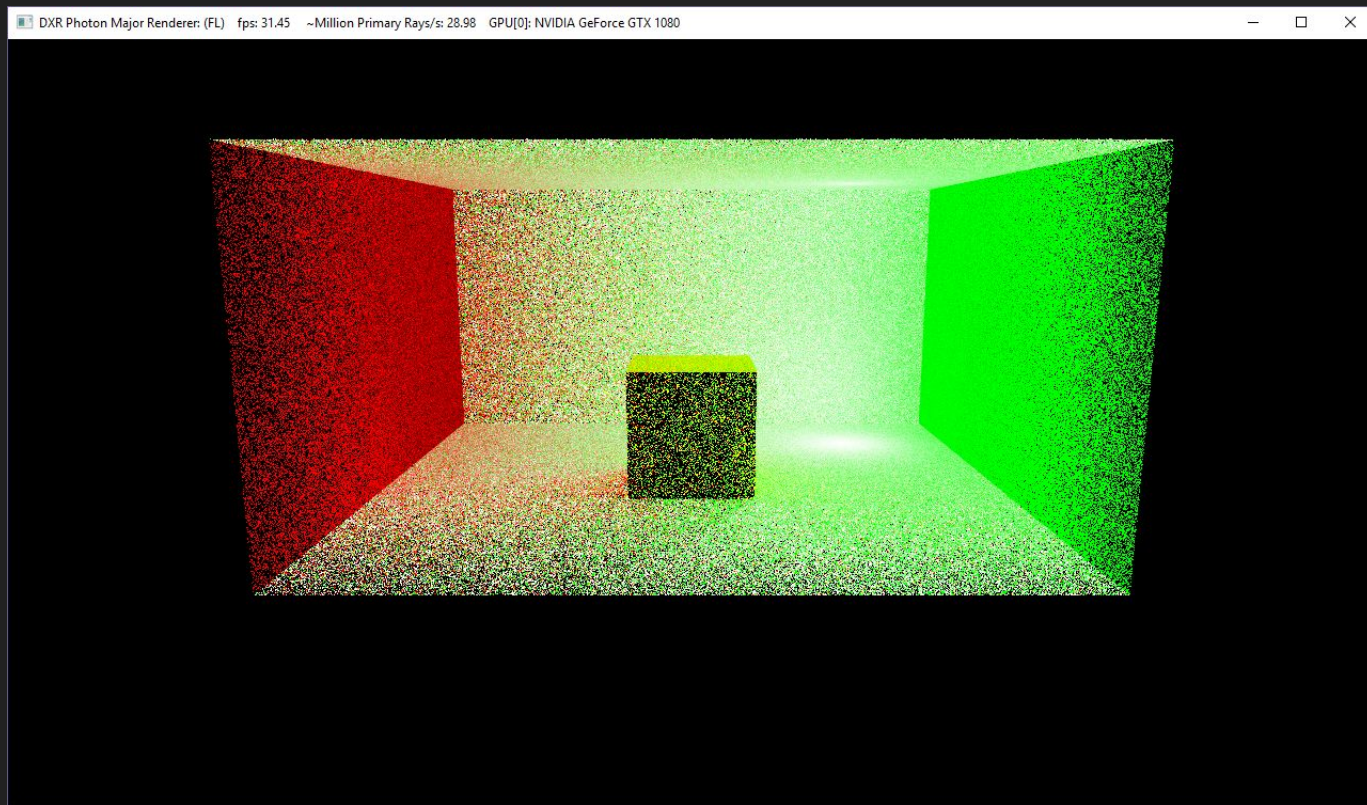
Depth : MaxBounces

Width : ScreenWidth

Height : ScreenHeight

Depth : 1

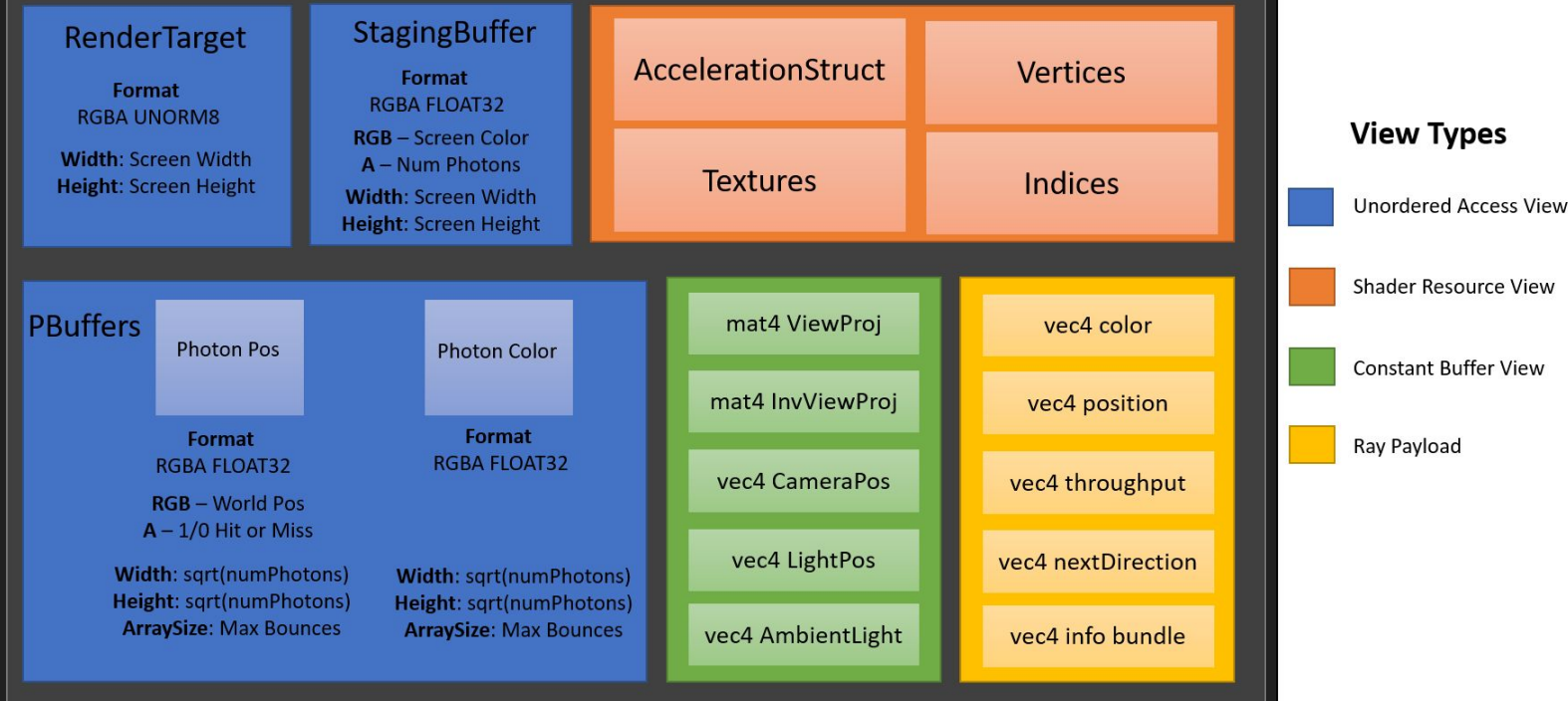
Photon Major



1M Photons

Memory

DXR Based Photon Mapper Memory Layout



Issues with DXR?

- 1) We have only tested the implementation on the fallback layer
- 2) Blackbox - acceleration structure