

Re: Deep G-Buffers for Stable Global Illumination Approximation

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Abstract

G-Buffers can be used to efficiently render images with a large amount of light sources compared to other local illumination methods. This is possible thanks to a process called "deferred rendering". By using Deep G-Buffers we can even approximate global illumination more efficiently than traditional methods like pathtracing.

Keywords *g-buffer, deep g-buffer, pathtracing, global illumination, shading*

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1 Global Illumination

Global Illumination is achieved by taking into account direct lighting as well as indirect lighting, which essentially means that we compute reflections to a certain degree. The most popular method to do this in 3D animated movies is pathtracing (source pixar paper).

1.1 Pathtracing

2 Deferred Rendering

2.1 How deferred rendering handles lighting more efficiently

3 G-Buffer

3.1 Frame-Buffer

3.2 Z-Buffer

3.3 Position-Buffer

3.4 Normal-Buffer

3.5 Diffuse-buffer

3.6 Computing local illumination using G-Buffers

3.7 Computing global illumination using G-Buffers

4 Deep G-Buffer

4.1 Concept

4.2 How Deep G-Buffers improve performance

5 Performance and Output Comparison

5.1 G-Buffers vs Deep G-Buffers vs Pathtracing