

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*

Contents

1	Global Illumination	2
1.1	Pathtracing	2
1.2	Photonmapping	2
2	Deferred Rendering	2
2.1	How deferred rendering handles lighting more efficiently	2
3	G-Buffer	2
3.1	Frame-Buffer	2
3.2	Z-Buffer	2
3.3	Position-Buffer	2
3.4	Normal-Buffer	2
3.5	Diffuse-buffer	2
3.6	Computing local illumination using G-Buffers	2
3.7	Computing global illumination using G-Buffers	2
3.8	Performance comparison: G-buffers vs Pathtracing	2
3.9	Output comparison: G-Buffers vs Pathtracing	2
4	Deep G-Buffer	2
4.1	Concept	2
4.2	How Deep G-Buffers improve performance	2
4.3	Performance comparison: G-buffers vs Deep G-Buffers vs Pathtracing	2
4.4	Output comparison: G-Buffers vs Deep G-Buffers vs Pathtracing	2

1 Global Illumination

Global Illumination is achieved by taking into account every light, as well as every reflection of every light. To do this there are different methods with the most common ones being pathtracing and photonmapping.

1.1 Pathtracing

1.2 Photonmapping

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

3.8 Performance comparison: G-buffers vs Pathtracing

3.9 Output comparison: G-Buffers vs Pathtracing

4 Deep G-Buffer

4.1 Concept

4.2 How Deep G-Buffers improve performance

4.3 Performance comparison: G-buffers vs Deep G-Buffers vs Pathtracing

4.4 Output comparison: G-Buffers vs Deep G-Buffers vs Pathtracing