Deep G-Buffers for stable Global Illumination Approximation

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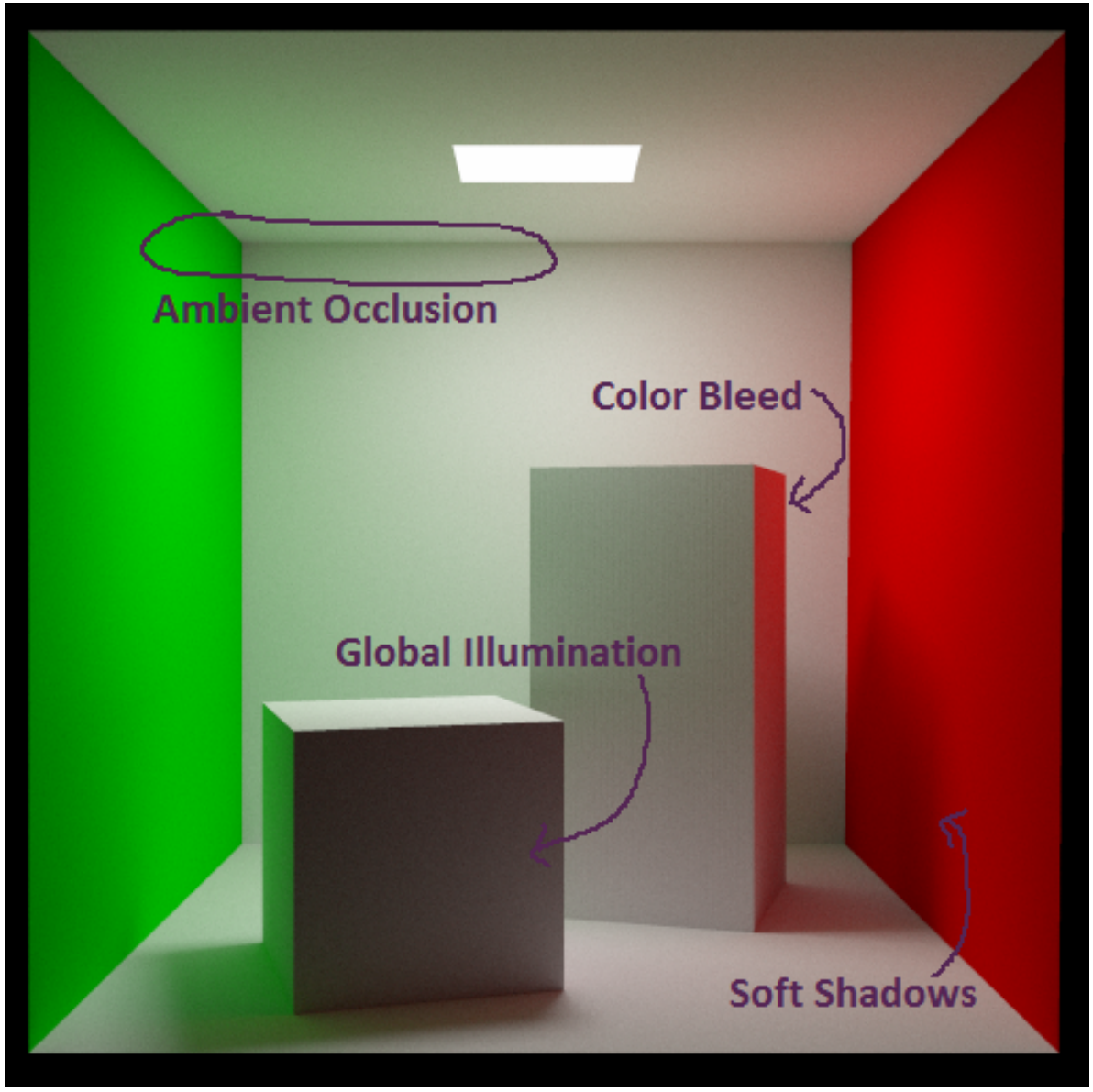
Global illumination

- lights a scene
- considers direct and indirect light
- causes visual effects that convey realism

Visual effects



Pathtracing

- send camera ray through each pixel
- trace it back to light source
- if light source was hit, the pixel is colored (albedo of object it hit)
- else it is black (in shadow)
- each pixel is sampled thousands of times, then averaged

Radiosity

- scene is divided into patches
- each patch is a light emitter and receiver
- iteratively update emmitance and radiance of each patch

Forward rendering

- compute lighting and shading in a single pass
- inefficient

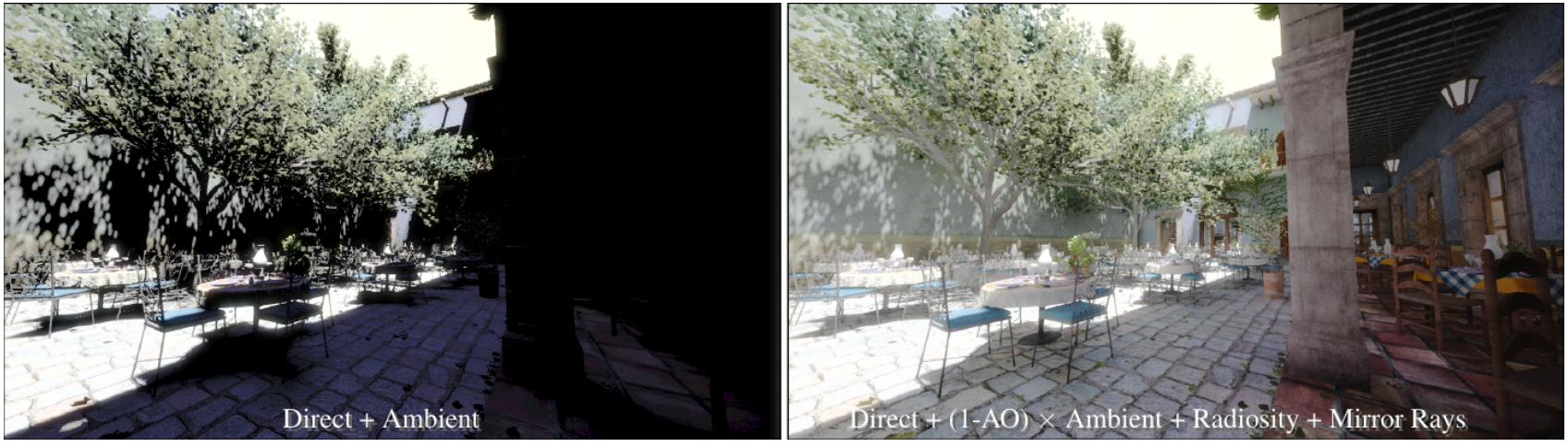
Deferred rendering (with G-Buffers)

- collect g-buffers in first pass
- compute lighting in second pass

Deferred rendering (with Deep G-Buffers)

- generate 2-layer deep g-buffer with depth peeling
- enforce minimum depth separation
- consider second layer for visual effects

Results



- using NVIDIA GeForce 980
- image was generated in 10.8ms (92 FPS)