

SIGGRAPH 2002

When Will Ray-Tracing Replace Rasterization?

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My Position

- We won't live to see it
- But ...
- Merged techniques will be common

Will IBR Replace Rasterization?

- Asked in Stanford course panel
- Easy to refute
- Suggests interesting issues:
 - Is Image Based Rendering another contender?
 - Does this tell us anything about ray tracing?
 - What has actually happened?

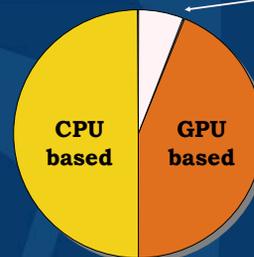
“In ten years, all rendering will be volume rendering.”

Jim Kajiya, 1991

Course 42

- High-Quality Volume Rendering on Consumer PC Hardware
- “How to leverage new features of modern graphics hardware to build interactive, high-quality volume rendering applications ...”
- Prerequisites: “Basic programming skills and familiarity with OpenGL.”

Volume Rendering Leverages Hardware



Special purpose hardware
(e.g. Volume Pro 1000)

Estimates courtesy of Vital Images

Techniques are Merged



- Works on CPUs and GPUs
- Fails on special purpose hardware

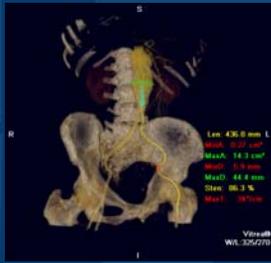


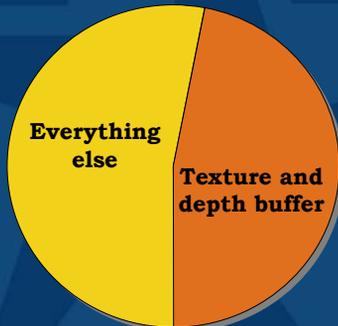
Image courtesy of Vital Images

Rasterization Includes Image Based Rendering



- Texture mapping
- Depth buffering
- Image composition
- ...

NV30 Die Area



Ray Tracing = Point Sampling



- Rasterization
 - No more talk of area sampling
 - Geometry is sampled at points
- High-quality rendering
 - Little talk of radiosity
 - Stochastic ray tracing dominates
- Images still area sampled
 - e.g. MIPmapping

“Reflection occlusion is cheaper than ray tracing.”

Hayden Landis,
Sunday in course 16

GPU Hardware Will Evolve



- Fast, parallel, programmable basis set
 - Image Based Rendering
 - Volume Rendering
 - Rasterization
 - Ray Tracing
 - ...

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