When Will Ray Tracing Replace Rasterization?

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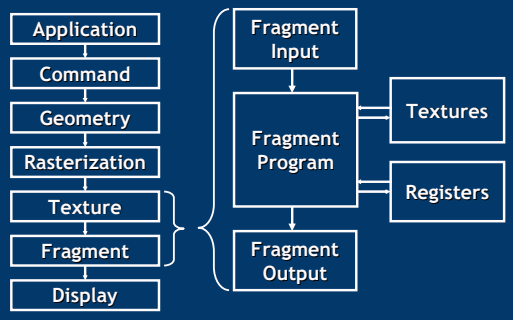
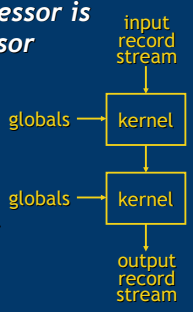
Programmable Graphics Processor



Rasterization with programmable fragment processing and dependent texutre mapping

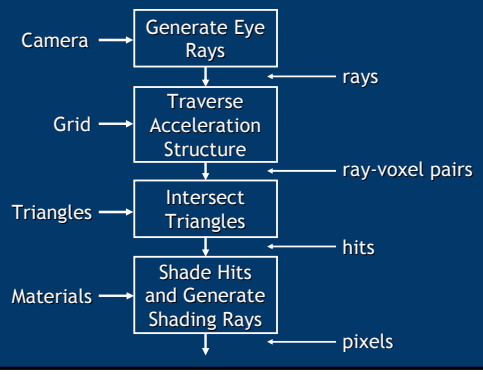
Stream Programming Model

Programmable fragment processor is essentially a stream processor



- Kernels and streams
  - Stream is a set of data records
  - Kernels operate on records
  - Streams connect kernels together
  - Kernels can read global memory

Ray Tracing Can Stream Too



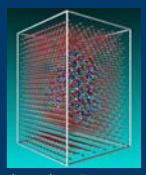
Who wins? Both!

- Ray tracing and rasterization are both tools
  - Use the right tool for the job
- Hybrid rendering
  - Standard OpenGL pass for initial visibility
  - Shading computed by ray tracing
    - Accurate shadows
    - Global illumination

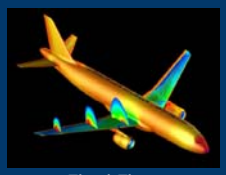
Demo

Open Issues

- Immediate mode ray tracing?
- Is streaming really the best architecture for ray tracing?
- Do other interesting computations map well to stream processing?



Molecular Dynamics



Fluid Flow

Shameless Plug

Ray Tracing on Programmable Graphics Hardware

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