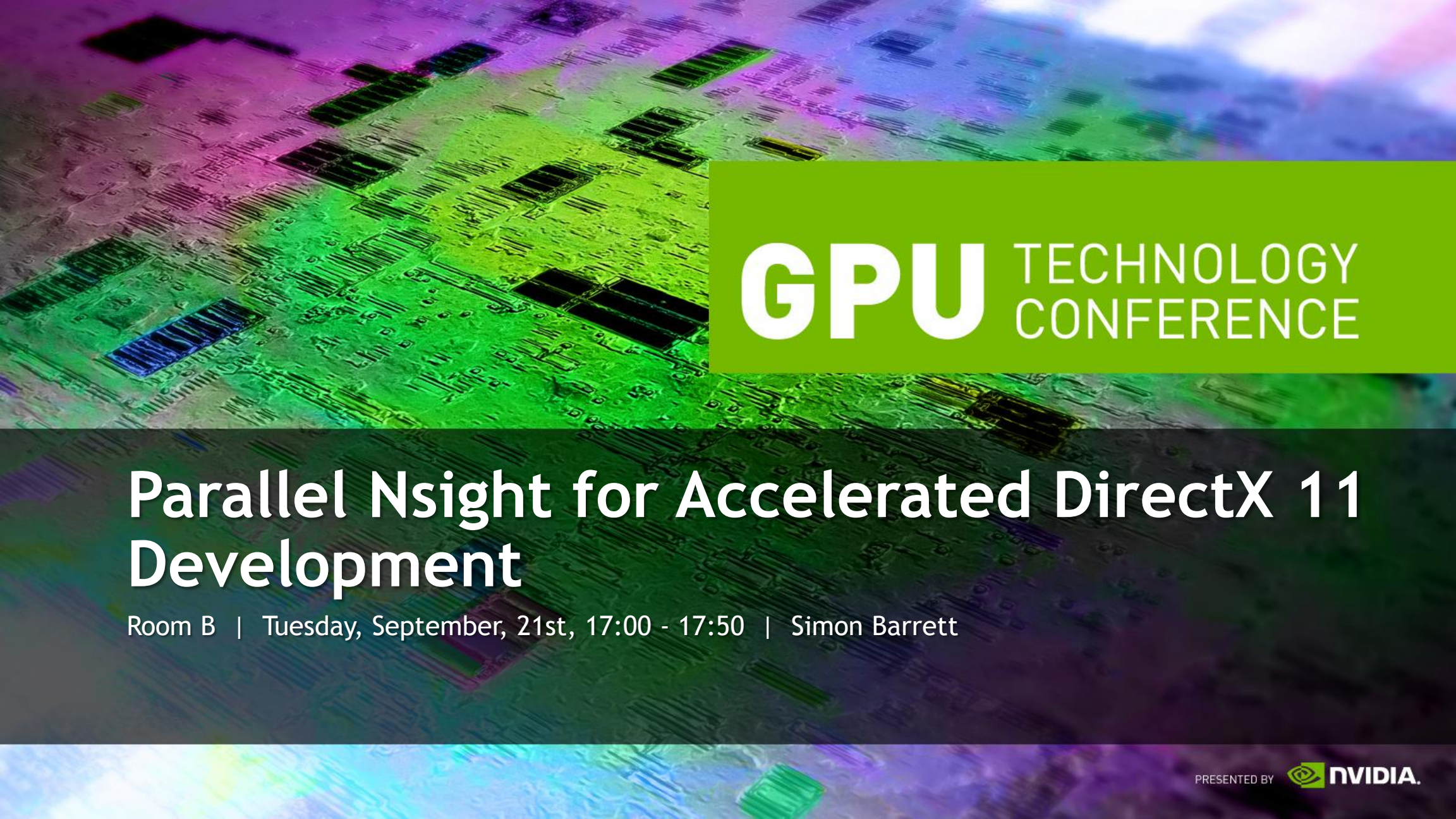


Parallel Nsight for Accelerated DirectX 11 Development

Room B | Tuesday, September, 21st, 17:00 - 17:50 | Simon Barrett

PRESENTED BY NVIDIA.

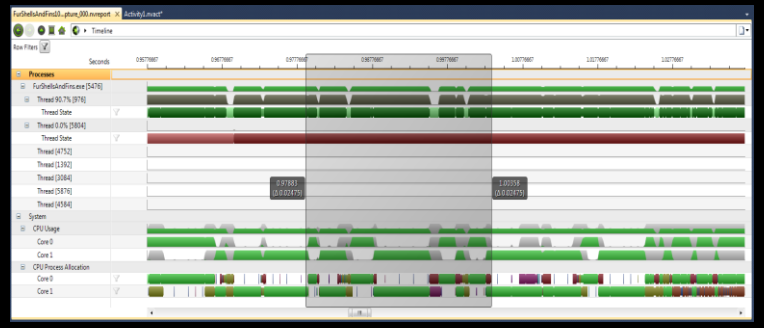
Ask Yourself…

- Where is your application bottlenecked?
  - Is your CPU profiler really telling you where your app. is bottlenecked? What if your app is bottlenecked on the GPU?
- How are you rendering the frame?
  - Are you executing redundant API calls for state set up?
  - Are you rendering excessive / broken geometry?
  - Are your shaders executing correctly, and efficiently?
- Are you utilizing the CPU and GPU cores effectively?

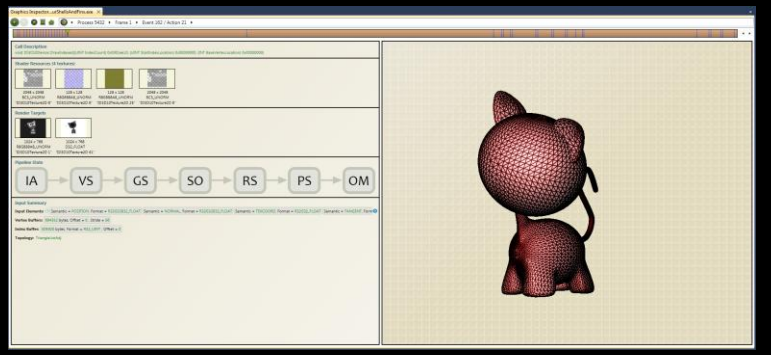
Parallel Nsight

- GPU computing solution in Visual Studio
- Debug, profile and analyze graphics and GPGPU applications
- Direct3D, DirectCompute, CUDA, OpenGL, OpenCL
- Host: Vista / Windows 7, Visual Studio 2008 / 2010
- Target: Vista / Windows 7, HUD overlay
- GPU: DirectX 10 / 11, OpenGL 3.2 / 4.0

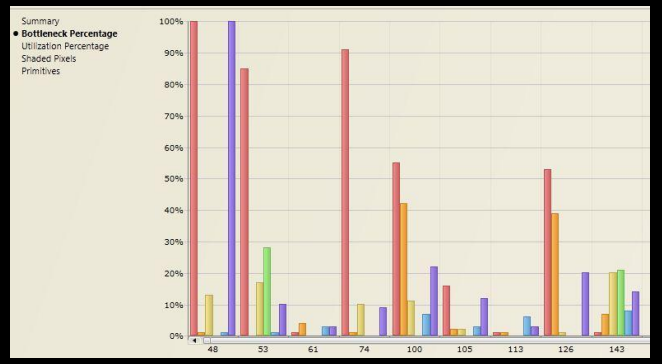
Parallel Nsight



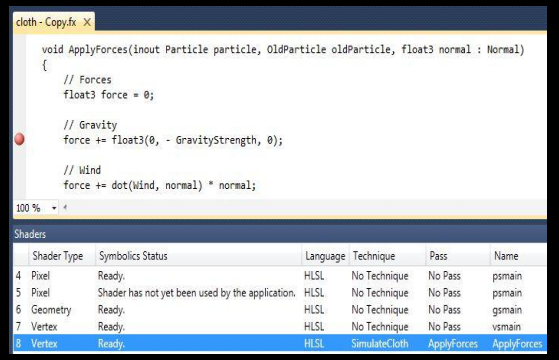
Analyzer



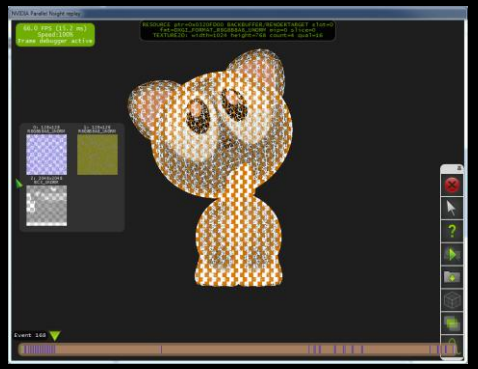
Graphics Inspector



Frame Profiler



Graphics Debugger



HUD

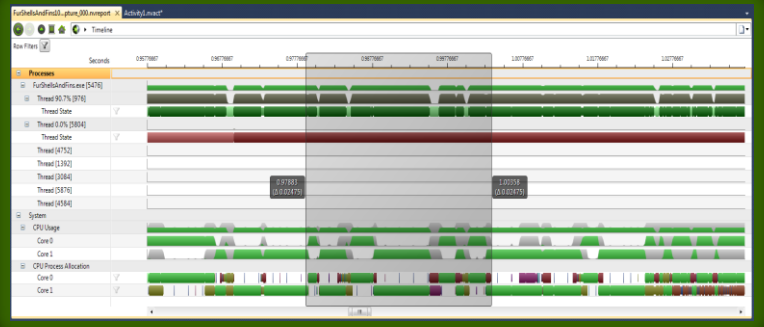
Demo

- Gamebryo MangledMetal DirectX11 game demo

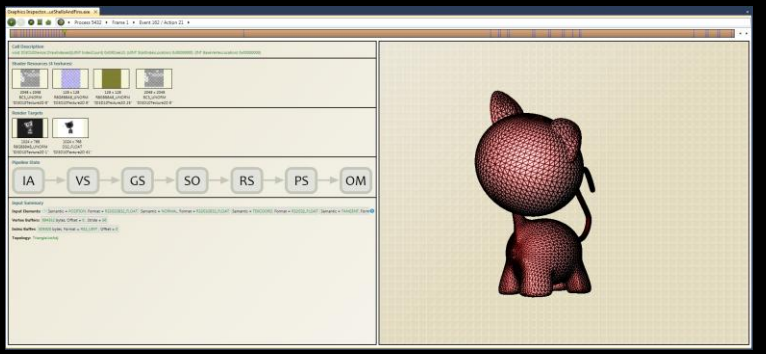
- Thank you Emergent Game Technologies!

GPU TECHNOLOGY CONFERENCE

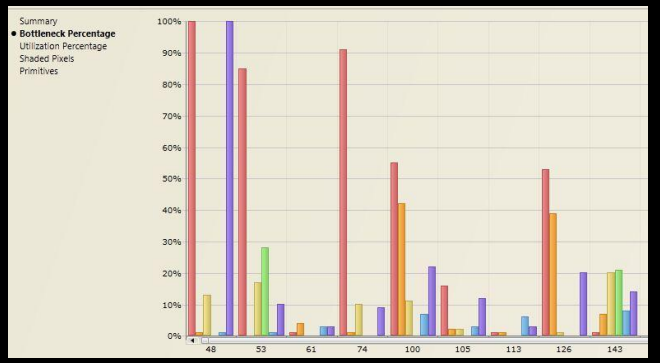
Parallel Nsight



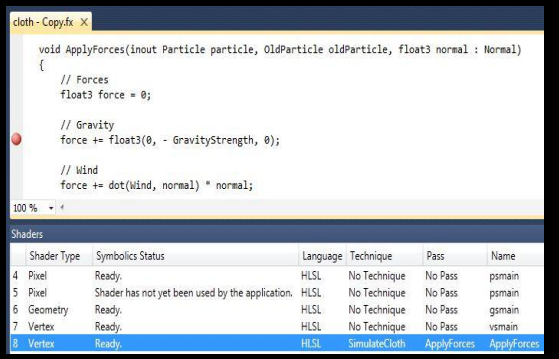
Analyzer



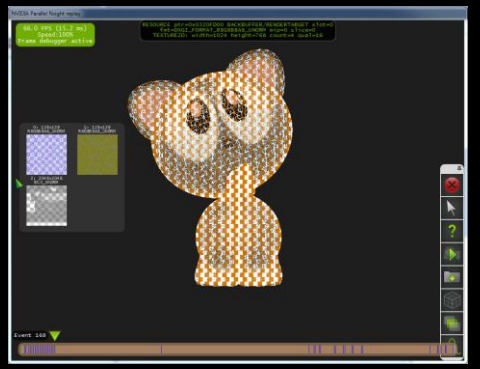
Graphics Inspector



Frame Profiler



Graphics Debugger



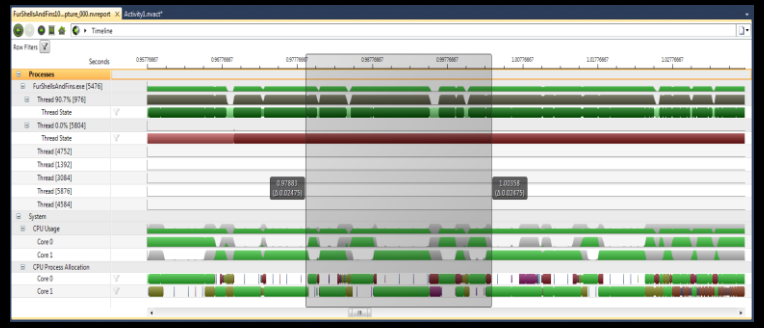
HUD

Annotate Your Application

- Add DirectX Perf Marker calls to annotate ranges of events
  - D3DPERF_BeginEvent() D3DPERF_EndEvent()
- Add WKPDID_D3DDebugObjectName calls to annotate objs
  - SetPrivateData(WKPDID_D3DDebugObjectName, 9, “MyTexture”);
- Add NVIDIA Tools Extension (NVTX) calls to annotate ranges and threads
  - Shipped as part of Parallel Nsight
  - $(NVTOOLSEXT_PATH)/include/nvToolsExt*.h
  - nvtxRangePush*() nvtxRangePop() nvtxNameOsThread*()

GPU TECHNOLOGY CONFERENCE

Parallel Nsight



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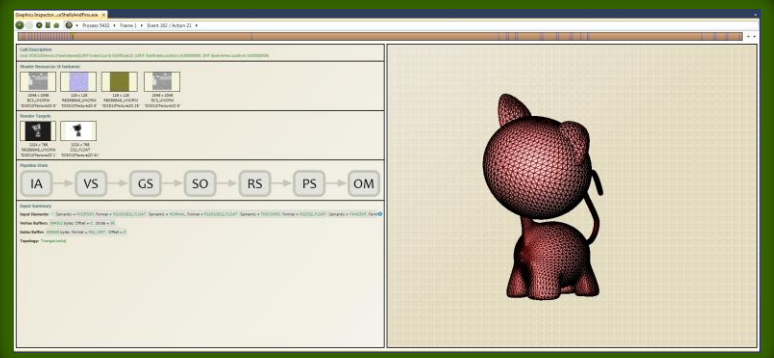
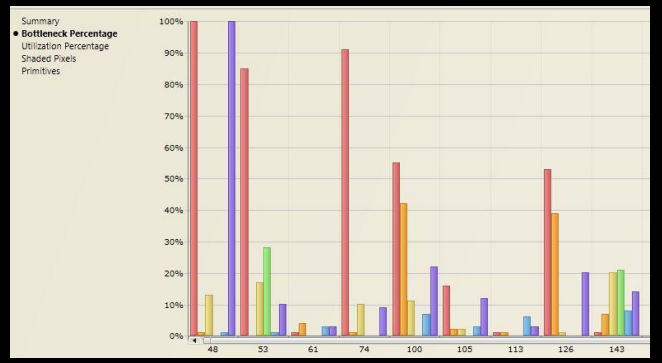


Graphics Inspector



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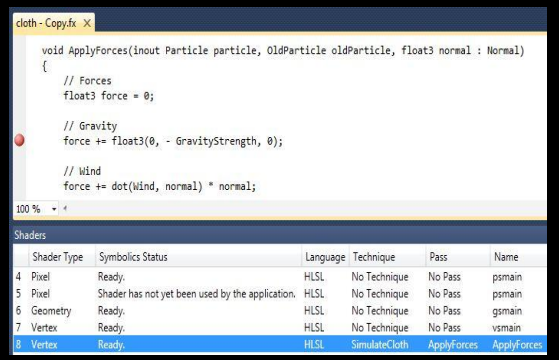

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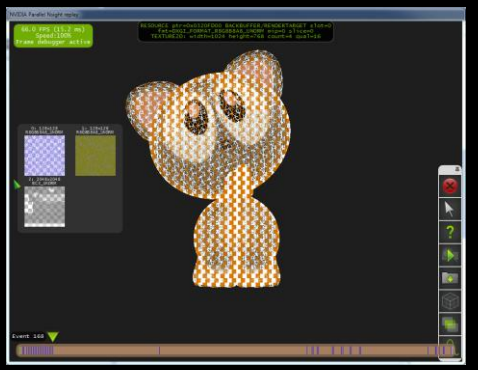
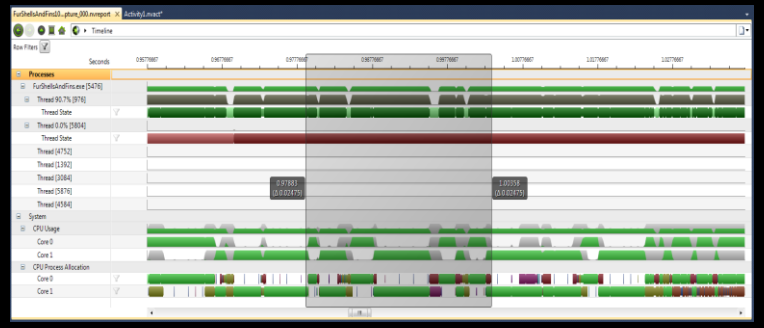


HUD

GPU TECHNOLOGY CONFERENCE

Parallel Nsight



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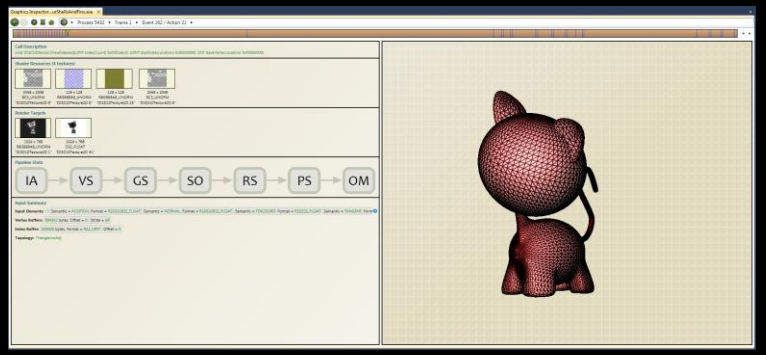
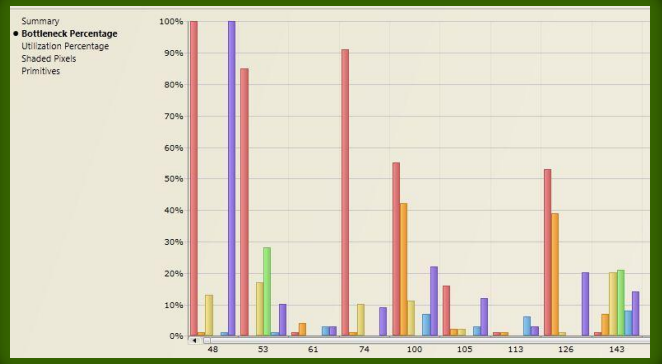
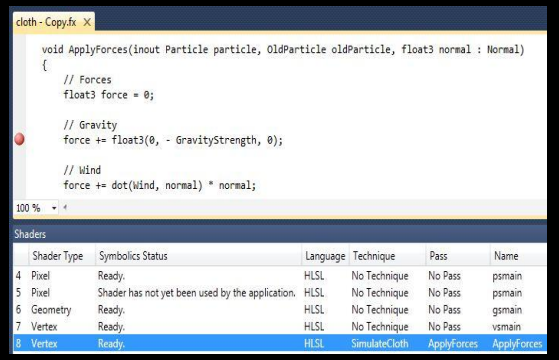


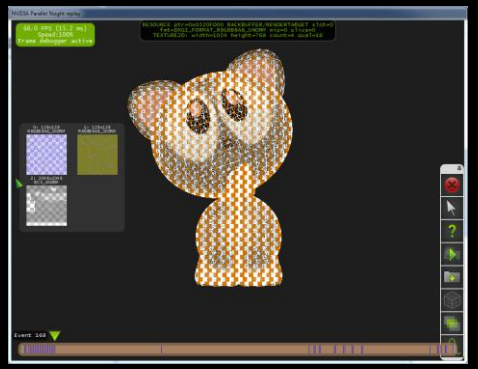
Graphics Inspector



Frame Profiler



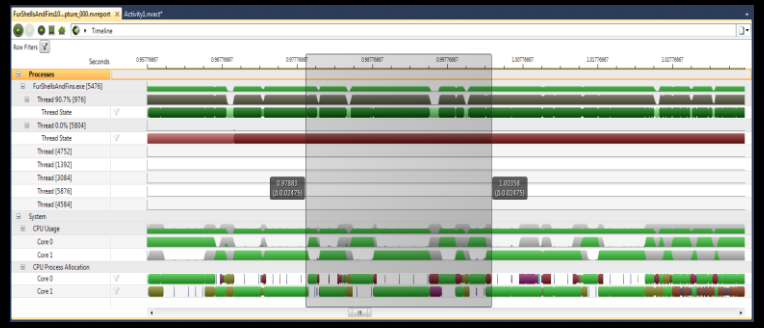
Graphics Debugger



HUD

GPU TECHNOLOGY CONFERENCE

Parallel Nsight



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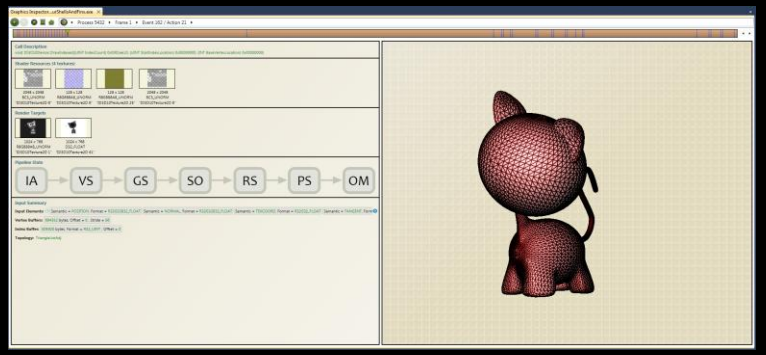
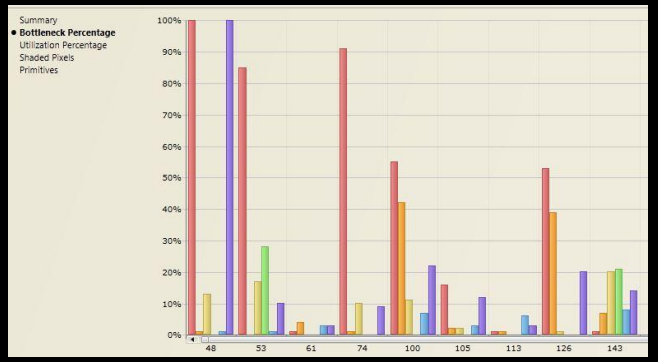
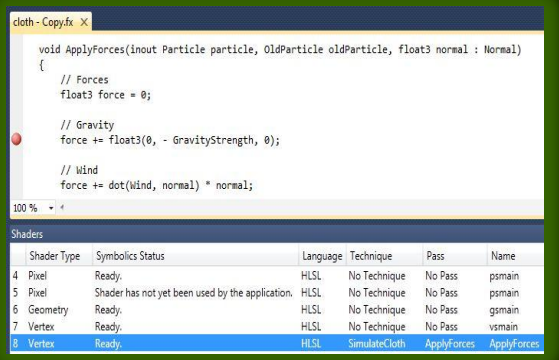


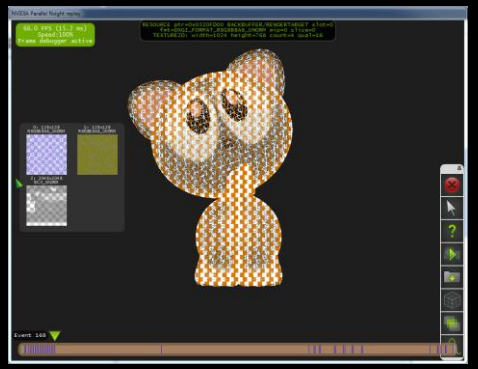
Graphics Inspector



Frame Profiler



Graphics Debugger



HUD

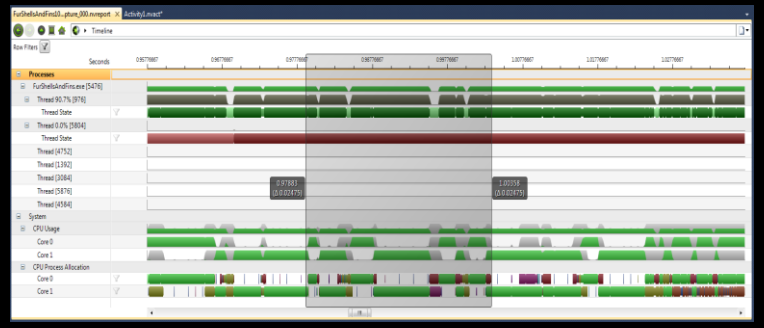
Ambient Occlusion

- Increases the realism of shadows
- Objects that block ambient light are accounted for
- Subtle shadows in depth valleys
- Implemented via a Compute Shader for this demo

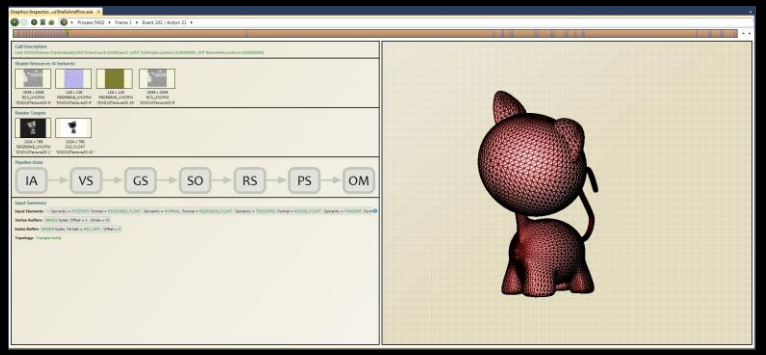
Graphics Debugger: AO Example

GPU TECHNOLOGY CONFERENCE

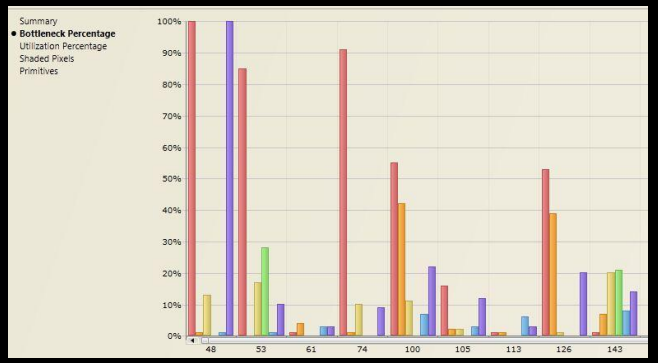
Parallel Nsight



Analyzer



Graphics Inspector



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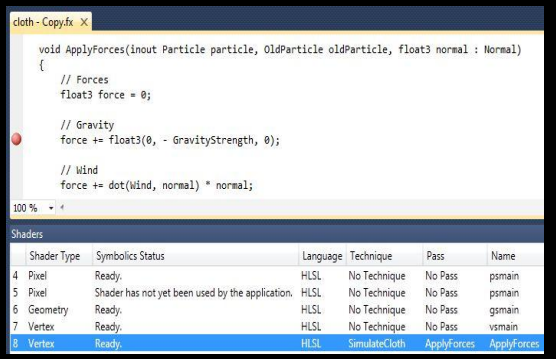

Graphics Debugger

HUD

Parallel Nsight HUD

- Scrubber
  - Hierarchical display of command lists
- Texture overrides
- Depth Complexity
- Save frame capture: My Documents\Parallel Nsight\Captures
- Replay capture: Nvda.Replayer.100.exe

Summary

- Annotate your application's ranges and D3D objects
- Use the Analyzer to find parallelism / blocking issues
- Use the Graphics Inspector to understand frame rendering
- Use the Frame Profiler to pinpoint GPU bottlenecks
- Use the Graphics Debugger to inspect / debug your shaders
- Use the HUD to test texture overrides and serialize frames
- Download Parallel Nsight today!
  - http://www.nvidia.com/ParallelNsight

Questions?