

# ***New Programming methods to increase GPU utilization and scale rendering performance***

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## **ABSTRACT**

OpenGL is over twenty years old and has gone through many optimizations. OpenGL 3 / 4 introduced many new features such as tessellation, compute shaders which result in less CPU overhead. However for many applications such as Visual Simulation it is still relatively easy to become CPU bound where the power of the GPU is limited by CPU speed and driver overheads.

In this talk, we will cover programming pointers to increase GPU utilization and scale rendering performance in your application using the latest OpenGL extensions. The objective is towards “Approaching Zero CPU Driver Overhead (AZDO)”

Specific key examples include:

- Command lists that provide an optimal way for batching and dispatching calls. This new extension is based on NVIDIA's bindless technology

- Multi-view projection acceleration - useful in high performance rendering for multi-projection viewports. The same geometry is projected multiple times in a single pass rather than the app iterating through every necessary projection in shaders.

- Tiled Resources also referred to as Sparse Textures that provide an efficient way to manage large textures.

## **BIO**

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Shalini Venkataraman is a Senior Applied Engineer in NVIDIA's Professional Solutions Group where she works on using GPUs to solve large-scale imaging and visualization problems in Medical, Oil&Gas and Scientific Computing domains. Prior to that she was a researcher at various High Performance Computing centers in the US and Singapore. Her interests are in parallel and large data visualization. She has a MS in Computer Science from the Electronic Visualization Lab, University of Illinois-Chicago and BS from the National University of Singapore.