

PixelVizion: An NPU-Embedded Visualization Accelerator for Large Data Sets

Features

As imaging and video technology continues to advance, the need to process, analyze, sort, and manipulate large data sets has grown tremendously. The image compositing function has become a visualization bottleneck. PixelVizion is the first Network Processor Unit (NPU)-based computer visualization tool that addresses this bottleneck. It brings single-pass network data transmission and on-the-fly image compositing that yields an order-of-magnitude increase in interactive response times. PixelVizion is a hardware-assisted, lossless, highly scalable, high-frame-rate solution to the visualization bottleneck of image compositing. It composites extremely large volumes of data at rates that are 10 to 20 times faster than those of current compositing technologies. As a cost-effective, commercial, off-the-shelf solution, PixelVizion removes the need for an expensive network interconnect and accommodates a variety of software rendering packages.

Applications

- Orthopedics, rehabilitation, and sports science
- Virtual medical training
- Specialized diagnostic imaging
- Virtual skin grafting
- Weather patterns
- Large-scale scientific problems
- Animation and special effects
- Video game graphics
- Film postprocessing

Benefits

- Provides 10x to 20x faster image composition
- Cost-effective, commercial off-the-shelf solution
- Removes the need for an expensive network interconnect
- Flexible programming to enable faster development cycles
- Highly modular and scalable
- Frees processing power for other applications
- Accommodates a variety of software rendering packages

For additional information contact:
Carolyn Connor Davenport, 505-665-9891, cmcd@lanl.gov



PixelVizion, the first Network Processor Unit (NPU)-based visualization accelerator, can be used to provide high-speed graphics composition for large data sets. The background image from the Foam Crush data set shows the noncompressed foam microstructure, a network of struts and membranes. Foreground is the PixelVizion system. The two large racks contain 16 rendering nodes. The smaller rack contains three NPUs, which bring single-pass network data transmission and on-the-fly image compositing, plus a display node.

Los Alamos 2006 Winners

ENABLE: Energetic Neutral Atom Beam Lithography/Epitaxy

Green Primaries: Enviro-Friendly Energetic Materials

MICHELLE: A Software Tool for Three-Dimensional Modeling of Charged-Particle-Beam Devices

PixelVizion: An NPU-Embedded Visualization Accelerator for Large Data Sets

Trident