NVIDIA Shading Rasterizer (NSR)

Per-Pixel Lighting and Bump Mapping with NSR

First introduced in GeForce2 GTS, the NVIDIA Shading Rasterizer™ (NSR) makes realistic material properties possible through per-pixel shading effects. Now with all NVIDIA second generation GPUs high-quality, dynamic per-pixel shading is possible. The NVIDIA Shading Rasterizer, combined with the blazing fill rate of an NVIDIA GPU, delivers incomparable resolution and accuracy. Complex scenes are now rich with detail. Features such as per-pixel bump mapping can be utilized to a more dramatic visual effect.

Why Per-Pixel Operations?
A pixel is the smallest unit that can be displayed on a screen. By bringing calculations for operations such as lighting and shading down to the smallest unit, developers can control such effects to the nth degree, making every image look stunning.

What is Per-Pixel Shading?

The NSR allows software developers to calculate lighting characteristics on a per-pixel basis in real time. Previous graphics solutions utilized light maps or vertex lighting, which compromised quality and accuracy for performance, forcing users to choose between real-time rendering or full-featured rendering. Developers no longer have to rely on basic multitexturing techniques to fool the eye—real-time per-pixel shading makes 3D elements look and behave like their real-life counterparts. With the NSR, wood looks grainy, lit objects gleam in the hotspots yet also cast realistic shadows, and water ripples and rolls into waves. Per-pixel lighting functions are now more accurate and more flexible than any lighting routine previously available—without compromising real-time performance.

The animated example above illustrates the advanced use of per-pixel shading. The figure without NVIDIA's Shading Rasterizer is fairly clear and detailed, but the figure with NSR is graphically stunning. The detailed texture of the creature's facial features comes alive; the definition of the nostrils and the furrowed brow are palpable.

Real-time per-pixel lighting is a revolutionary technology made possible for the first time by the NVIDIA Shading Rasterizer. Dynamic per-pixel lighting frees developers from the restrictions of other lighting schemes and provides them with a sophisticated palette of effects. With the power of the NSR, a second generation NVIDIA GPU elevates the multimedia experience by maintaining high resolutions in dynamic environments and delivering the ultimate gaming experience. (http://www.OrpheusComputing.com/)