

GPU Development Made Simple

RTT AG recently announced a high-performance, real-time ray tracer, RealTrace, as part of DeltaGen, their software for complex 3D visualization. A leading global provider of visualization in the automotive, aerospace and consumer goods sector, RTT created the ray tracer using the RapidMind multi-core software platform running on graphics processing units (GPUs).

By leveraging the RapidMind multi-core software platform, applications such as this can harness the full potential of the latest multi-core processors from Intel® and AMD® as well as seamlessly take advantage of the application acceleration available in today's stream processors such as the GPU or the Cell BE. With RapidMind, software developers focus on the algorithms to best drive innovation in their application and the RapidMind platform provides the cutting edge performance promised by these new processors. The resulting applications is hardware independent and will automatically scale to additional cores and future multi-core processors.

"The RapidMind platform abstracts away the complexities of multi-core programming, allowing RTT to harness the tremendous performance of GPUs. With RapidMind, we can quickly roll out applications that provide our customers with unprecedented capabilities in lightning-fast timelines once thought impossible. Our real-time, interactive RTT RealTrace system is one such example."

-Peter Stevenson, chief operating officer of RTT USA

Real-time Ray Tracing

Why ray tracing? Ray tracing provides physically accurate support for effects such as reflection and refraction, which are not easily obtained otherwise. Ray queries are a fundamental computer graphics operation and are the basis for physically correct light simulations, line-of-sight calculations and collision detection.

Why real-time? Traditionally, ray tracers have been used only for time-consuming offline renderings. Real-time ray tracing brings movie-class effects to real-time visualization applications. Instead of employing large clusters of computers to do this, RTT's solution can run on GPU processors. This means that a single machine can be used for tasks such as seeing what a proposed headlamp looks like or for checking for bothersome reflections in a windshield.

By exploiting the programmability of the RapidMind platform, the ray tracer allows the use of arbitrary shaders to describe the surface materials of objects located in the scene to be ray traced. Because of the highly parallel nature of the RapidMind platform, rays are traced in a highly efficient matter, allowing large and complex models to be displayed in real-time by making use of the parallel vector processing capabilities of GPUs. All of the standard features commonly found in ray tracing engines are supported by RealTrace.

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