

## GPU Technology Conference 2010 Sessions on Ray Tracing

(subject to change)

*IMPORTANT: Visit [www.nvidia.com/gtc](http://www.nvidia.com/gtc) for the most up-to-date schedule and to enroll into sessions to ensure your spot in the most popular courses.*

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### **2047 - Bridging Ray and Raster Processing on GPUs**

Explore new techniques in real time rendering. We will discuss a system for ray traced global illumination (GI) carefully integrated with a traditional raster renderer using an incremental irradiance cache. Covers novel GPU methods for spawning secondary GI rays on only visible cells, smoothly sampling the visible 3D cache into 2D, and incrementally ray traced spherical harmonics basis. Details applying a range of optimizations to achieve real-time frame rates with the OptiX ray tracing engine.

Speaker: Kenny Mitchell, Black Rock Studio

Topic: Ray Tracing

Time: Tuesday, September, 21st, 11:00 - 11:50

### **2074 - Driving a Product from Rasterization to Ray Tracing: The Developer Experience**

Learn from the challenges encountered while using DirectX to update the Bunkspeed Move rasterization engine to work with Mental Images' iRay. This work was part of the creation of Bunkspeed Shot, which allows the user to leverage both the high quality image generation of iRay and a highly interactive, good quality rasterization engine (used for quick setup of a scene). Covers major differences between a ray tracing based interactive system, including GPU based ray tracing, and a traditional GPU rasterization engine.

Speaker: Morgan Nicholas, Bunkspeed

Topic: Ray Tracing

Time: Tuesday, September, 21st, 15:00 - 15:50

### **2250 - GPU Ray Tracing Exposed: Under the Hood of the NVIDIA OptiX Ray Tracing Engine**

Take a deep dive into many of the design choices and implementation details of the NVIDIA OptiX ray tracing engine. Learn how domain specific compilation, a unique execution model and a general object model, are combined into a flexible and powerful API.

Speakers: Steve Parker, NVIDIA, Austin Robison, NVIDIA, Phillip Miller, NVIDIA

Topic: Ray Tracing

Time: Tuesday, September, 21st, 17:00 - 17:50

## **2042 - Interactive 3D Audio Rendering Systems**

Learn how to leverage GPUs for interactive audio rendering. This session will give a short overview of the architecture of current GPUs, emphasizing some key differences between GPU and CPUs programming models for audio processing. We will illustrate the benefits of GPU-accelerated audio rendering with results from 3D audio processing and sound scattering simulations. Finally, we will discuss best practices for GPU implementations as well as future opportunities for audio rendering on massively parallel architectures.

Speaker: Nicolas Tsingos, Dolby Laboratories

Topics: Audio Processing, Ray Tracing, Signal processing

Time: Thursday, September, 23rd, 11:00 - 11:50

## **2261 - Introduction to GPU Ray Tracing with NVIDIA OptiX (Pre-Conference Tutorial)**

Learn how to use NVIDIA OptiX to quickly develop high performance ray tracing applications for interactive rendering, offline rendering, or scientific visualization. This session will explore the latest available OptiX version.

Speakers: Dave McAllister, NVIDIA, Steve Parker, NVIDIA, Phillip Miller, NVIDIA

Topics: Ray Tracing, High Performance Computing, Computer Graphics

Time: Monday, September, 20th, 14:30 - 15:50

## **2024 - NVIDIA Acceleration Engines with NVIDIA SceniX (Pre-Conference Tutorial)**

Learn how NVIDIA SceniX is a rapid start to building state of the art, realtime 3D applications, and how raytracing can be combined with raster graphics for new levels of interactive realism.

Speakers: Phillip Miller, NVIDIA, Holger Kunz, NVIDIA

Topics: Programming Languages & Techniques, Computer Vision, Ray Tracing

Time: Monday, September, 20th, 13:00 - 14:20

## **2056 - Next-Generation Rendering with CgFX**

Dive into the details of using CgFX – Cg’s effect framework – to combine ray-tracing with real-time rendering and enable the next generation of complex high-quality rendering. You will learn how to use CgFX to create complex rendering effects in a concise and elegant fashion by: - Blending material-level and scene-level effects in a consistent way, - Seamlessly integrating CUDA-based data processing within the CgFX rendering pipeline, - Mixing OptiX-based rendering with CgFX and OpenGL.

Speaker: Tristan Lorach, NVIDIA

Topic: Ray Tracing

Time: Tuesday, September, 21st, 16:00 - 16:50

## **2104 - Rapid Prototyping Using Thrust: Saving Lives with High Performance Dosimetry**

Radiation poisoning is an everpresent danger for intervention teams that must visit nuclear sites. Virtual reality can help teams prepare for intervention, but efficient computation of radiation dosage is critical to study complex scenarios. Radiation protection research often uses codes based on the straight line attenuation method. As with other approaches, geometrical computations (finding all the interactions radiation rays/objects intersection) remain the simulation bottleneck. This talk will describe how we have used the Thrust high-level library for CUDA C/C++ to quickly prototype innovative algorithms and achieve a significant speed up.

Speaker: Lancelot Perrotte, CEA

Topics: High Performance Computing, Algorithms & Numerical Techniques, Physics Simulation, Ray Tracing

Time: Wednesday, September, 22nd, 11:00 - 11:50

## **2013 - iray - GPUs and the Photorealistic Rendering Revolution**

Hear about the ongoing revolution in the production of photorealistic imagery being powered by GPUs. We will explore the algorithms and concepts behind iray – a CUDA accelerated

software library from mental images/NVIDIA that provides an interactive, push-button, fast synthetic digital camera in software to a variety of OEM applications and platforms. We will demonstrate iray embedded in commercial CAD and Digital Content Creation applications as well as in 3D cloud computing platforms.

Speaker: Michael Kaplan, mental images/NVIDIA

Topics: Digital Content Creation (DCC), Cloud Computing, Ray Tracing

Time: Tuesday, September, 21st, 14:00 - 14:50