GPU Technology Conference 2010 Sessions on Stereoscopic 3D

(subject to change)

IMPORTANT: Visit 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.

2009 - 4D Visualization and Analysis of Flow

4D flow or vector data is now common in CFD simulations as well as acquisition techniques like 4D flow MRI to study abnormal blood flow patterns. We show how by mixing compute and graphics combined with stereo we are now able to interactively analyze and visualize the resulting data to understand abnormal flow patterns. Topics include flow field rendering, computing derived quantities, merging volumetric rendering with computed geometry such as particles and surfaces, and integration 3d vision stereo.

Speaker: Shalini Venkataraman, NVIDIA

Topics: Medical Imaging & Visualization, Computational Fluid Dynamics, Stereoscopic 3D

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

2107 - Accelerating Stereographic and Multi-View Images Using Layered Rendering

Explore applications of geometry shaders in improving the performance of stereo pair or multi-viewer image generation. This session will cover the basic approach of single-pass stereo-pair creation and provides guidelines for when layered rendering can be used to increase performance. A particular emphasis will be placed on virtual reality and scientific visualization, but the techniques discussed apply to a wide range of rendering environments. Results will be shown for three GPU architectures, including the new GF100 GPU.

Speaker: Jonathan Marbach , TerraSpark Geosciences, LLC

Topic: Stereoscopic 3D

Time: Thursday, September, 23rd, 15:00 - 15:50

2093 - Computational Photography: Real-Time Plenoptic Rendering

Get the latest information on GPU-based plenoptic rendering including a demonstration of refocusing, novel view generation, polarization, high dynamic range, and stereo 3D. Learn how GPU hardware enables plenoptic rendering tasks with high-resolution imagery to be performed interactively, opening up entirely new possibilities for modern photography.

Speakers: Andrew Lumsdaine, Indiana University, Georgi Chunev, Indiana University, Todor Georgiev, Adobe Systems

Topics: Imaging, Computer Vision, Stereoscopic 3D

Time: Wednesday, September, 22nd, 16:00 - 16:50

2043 - Disparity Map Generation

Explore the algorithms and implementation of disparity maps on the GPU. We will discuss how a disparity map facilitates stereoscopic content creation, applications and approaches tried, and final results of real time calculations on GPUs.

Speaker: Henry Gu, GIC

Topics: Stereoscopic 3D, Computer Vision, Imaging

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

2215 - Extending OpenCV with GPU Acceleration

OpenCV is a widely popular computer vision library, with millions of downloads and hundreds of thousands of users. Applications span many industries including robotics, industrial machine vision, automotive, film & broadcast, medical, and consumer applications. NVIDIA and the OpenCV development team are collaborating to provide CUDA implementations of the most demanding algorithms, thus enabling a new level of real-time capability and higher quality results.

This talk with introduce OpenCV, and summarize the new CUDA enabled capabilities, and provide an overview of future plans.

Speaker: Joe Stam, NVIDIA

Topics: Computer Vision, Imaging, Stereoscopic 3D, Video Processing

Time: Thursday, September, 23rd, 10:00 - 10:50

2019 - GPU-Accelerated Internet Technologies & Trends

Join us for a whirlwind demo-punctuated tour of up-and-coming technologies that promise to bring GPU acceleration to the Worldwide Web. We'll cover 2D graphics, 3D graphics and video. In addition to summarizing the emerging standards and technologies, performance test results showing how they scale on various GPUs will be presented, along with recommendations for how to design for best performance. Finally, adoption trends and ecosystem dynamics will be summarized. Attendees should leave with a richer understanding of the possibilities enabled by the GPU-Accelerated Web, and new insights into when and how it will matter.

Speaker: Chris Pedersen, NVIDIA

Topics: GPU Accelerated Internet, Stereoscopic 3D, Video Processing

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

2072 - GPUs at the Computer Animation Studio

Learn five simple ways in which GPUs have been adopted in the production pipeline at Blue Sky Studios. Covers how we use GPUs to improve animation tools, add real-time anaglyph support, and accelerate noise functions including code samples from production tools.

Speaker: Hugo Ayala, Blue Sky Studios

Topics: Film, Stereoscopic 3D, Tools & Libraries

Time: Wednesday, September, 22nd, 16:00 - 16:50

2010 - Implementing Stereoscopic 3D in Your Applications (Pre-Conference Tutorial)

Let's dive into the 3rd dimension. This talk presents a comprehensive technical overview of NVIDIA’s stereo technology and tools. After a complete introduction to NVIDIA’s stereo technology, we will then explore in more detail production techniques for the new artistic space of effects and creativity offered by 3D stereo. The take away of this session will be a solid understanding of NVIDIA’s stereo technology and how to take best advantage of it.

Speakers: Samuel Gateau, NVIDIA, Steve Nash, NVIDIA

Topics: Programming Languages & Techniques, Stereoscopic 3D

Time: Monday, September, 20th, 16:00 - 17:20

2071 - Large Scale Visualization Soup

The unprecedented realism that is possible today allows for visualization at an ever larger scale. This talk will walk through several case studies from high resolution single displays to completely immersive environments. Details will be shared on how to architect and implement these installations, with attention to the typical issues encountered. It will cover how to implement stereo 3D in OpenGL, Direct3D, as well as how that relates to the different display technologies (projectors, multi-display, CAVEs, etc.).

Speaker: Steve Nash, NVIDIA

Topic: Stereoscopic 3D

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

2065 - Massively Accelerating Iterative Gauss-Newton Fitting

To measure three-dimensional shape data of objects, we build up a measurement system that assigns three-dimensional coordinates to the position of projected measurement labels in a camera image. To achieve high measurement accuracy across high amounts of measurement points, we need a very quick routine to localize measurement labels with high precision. To speed up the computation, we evaluate the fits using the CUDA architecture. The final implementation speeds up the fitting of 104 two-dimensional Gauss functions by a factor of 90.

Speaker: Daniel Härter, University of Freiburg, IMTEK, Laboratory for Process Technology

Topics: Computer Vision, Stereoscopic 3D

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

2169 - Real-time Volumetric Medical Ultrasound Applications for GPU Computing

Real-time volumetric medical ultrasound requires computationaly intensive rapid processing of data for visualization of aquired acoustic data. Clinical applications of GPU-based technologies in obstetrics and cardiology will be discussed.

Speaker: Roee Lazebnik, Siemens Healthcare

Topics: Medical Imaging & Visualization, Imaging, Stereoscopic 3D, Computer Graphics

Time: Wednesday, September, 22nd, 10:00 - 10:50

2241 - Standing Out: Implementing a Great Stereo UI

Learn how to make S3D compatible user interfaces, HUDs, and in-game menus. The first part of this session will outline the common problems users encounter when displaying traditional 2D UI in stereoscopic 3D. The second part will focus on the different techniques, tips/tricks, and best practices developers can use to create high-quality S3D interfaces. The presentation will highlight examples from several shipped titles, as well as showcase a complete 3D UI game demo running in S3D on multiple devices including PC and mobile.

Speaker: Brendan Iribe, Scaleform

Topics: Stereoscopic 3D, Tools & Libraries, Computer Graphics, Mobile & Tablet & Phone

Time: Thursday, September, 23rd, 14:00 - 14:50

2146 - Virtual Surgery

Come see how 3D Vision technology is used in Virtual Surgery Training for Medical Education. BioDigital Systems in conjuncture with University of California San Francisco (UCSF), has developed a dental injection simulator to teach students of dentistry the mechanics of nerve block injection. 3D Vision Technology has added a new dimension of realism by providing users with a unique immersive experience.

Speaker: Aaron Oliker, BioDigital

Topics: Medical Imaging & Visualization, Stereoscopic 3D

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

2222 - Working Man's Guide to 3D Video Editing

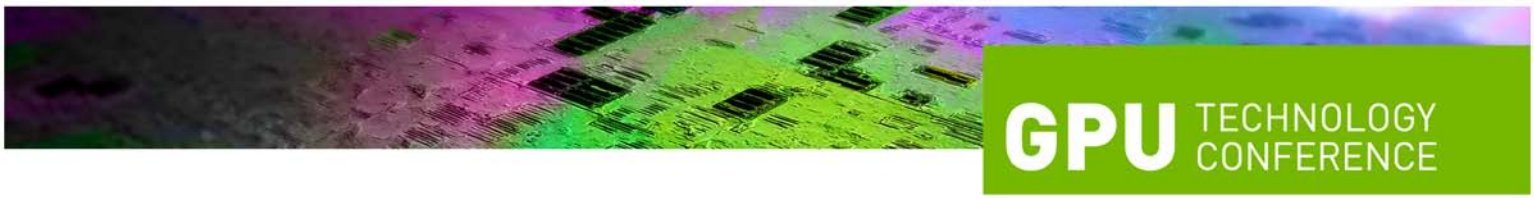
Video editing is currently at two simultaneous inflections points: use of GPUs for video processing and the beginning of wide spread adoption of 3D. At this time however, identifying and navigating through the necessary tools and equipment to create compelling 3D video content is challenging.

This session is intended to provide a pragmatic guide to creating prosumer 3D video content and how the GPU greatly assists and speeds up this process.

The intended audience is anyone interested in how to create compelling 3D movies at a prosumer level.

Speakers: Ian Williams, NVIDIA, Kevan O'Brien, NVIDIA

Topics: Digital Content Creation (DCC), Stereoscopic 3D



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