GPU Technology Conference 2010 Sessions on Film (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.

2125 - Developing GPU Enabled Visual Effects For Film And Video

The arrival of fully programable GPUs is now changing the visual effects industry, which traditionally relied on CPU computation to create their spectacular imagery. Implementing the complex image processing algorithms used by VFX is a challenge, but the payoffs in terms of interactivity and throughput can be enormous. Hear how The Foundry's novel image processing architecture simplifies the implementation of GPU-enabled VFX software and eases the transition from a CPU based infrastructure to a GPU based one.

Speakers: Bruno Nicoletti, The Foundry, Jack Greasley, The Foundry

Topics: Film, Tools & Libraries, Video Processing

Time: Wednesday, September, 22nd, 14:00 - 14:50

4011 - Emerging Companies: CEO on Stage featuring Cinnafilm, Perceptive Pixel, and Total Immersion

See the hottest new technologies from startups that could transform computing.

In a lively and fast-paced exchange, the “Emerging Companies Summit - CEO on Stage” sessions will feature CEOs from three startups who will have 8 minutes to introduce their companies and 8 minutes to interact with a panel of industry analysts, investors and technology leaders.

This CEO on Stage session will feature Cinnafilm, Perceptive Pixel, and Total Immersion - covering film, imaging, and computer vision.

Panelists will include Bill Tai (CRV), Paul Weiskopf (Adobe), and Tim Bajarin (Creative Strategies).

Speakers: Bill Tai, Charles River Ventures, Lance Maurer, Cinnafilm, Inc., Bruno Uzzan, Total Immersion, Paul Weiskopf, Adobe, Tim Bajarin, Creative Strategies

Topics: General Interest, Computer Vision, Film, Imaging

Time: Thursday, September, 23rd, 16:00 - 16:50

2239 - Fast GPU Preconditioning for Fluid Simulations in Film Production

Explore how a less efficient, but highly parallel algorithm can still be a superior alternative to a sequential CPU method. This talk will present a simple CUDA-based Poisson solver to the conjugate gradient method designed for solving well-conditioned matrices such as those that arise from the pressure projection stage of a Navier-Stokes fluid solver. In contrast to other active areas of research in this field, we show that a more brute force approach can still significantly out-perform the best CPU alternatives by sacrificing a high convergence rate in place of achieving much faster iterations.

Speaker: Dan Bailey, Double Negative

Topics: Computational Fluid Dynamics, Algorithms & Numerical Techniques, Film

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

2284 - GPU implementation of Collision-Based Deformation

Addressing the production needs for the upcoming Disney animated movie, we are in the process of developing a new Maya deformer that incorporates state-of-the-art collision-based deformations. Our deformer includes both dynamic and quasi-static solutions. Our solvers conserves volume and constrains surface area by solving linear systems in a graded volume mesh. To achieve realistic deformation in production-ready data at interactive rates, we leverage the computational power of the NVIDIA GPU architecture using CUDA. Our underlying data structure is specifically designed and optimized for CUDA (i.e. coalescing data access, minimizing CPU-GPU interaction, utilizing shared memory).

Speaker: Dmitriy Pinskiy, Walt Disney Animation Studios

Topic: Film

Time: Wednesday, September, 22nd, 17:30 - 17:50

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

2162 - Real-time Reyes: Programmable Rendering on Graphics Processors

We present a discussion of ideas and techniques behind programmable graphics pipelines on modern GPUs, specifically the example design of a real-time Reyes renderer. Walking through this example, we address the philosophy beneath programmable GPU graphics, the broad strategy for the specific pipeline, and algorithmic and implementation-level details for key rendering stages. We cover several issues concerning GPU efficiency, including those involving work scheduling, parallelization of traditional stages, and balancing of rendering workloads. We expect the audience to gain an in-depth exposure of the state of research in programmable graphics, and an insight into efficient pipeline design for irregular workloads.

Speakers: Anjul Patney, University of California, Davis, Stanley Tzeng, University of California, Davis

Topics: Computer Graphics, Film

Time: Wednesday, September, 22nd, 17:00 - 17:50

2165 - Rendering Revolution

Learn how GPU technologies are transforming the making of pixels. This talk will cover GPU-centric rendering techniques that leverage both the raw computational capabilities of NVIDIA's GPUs and advanced pixel-shading techniques for interactive visualization and rendering.

Speaker: Ken Pimentel, Autodesk

Topics: Computer Graphics, Film

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

2285 - Walt Disney Animation Studios' GPU-Acelerated Animatic Lighting Process with Soft Shadows and Depth of Field

See how Walt Disney Animation's software uses OpenGL and GLSL shaders to interactively display depth of field, accurate lighting, and soft shadows in the Maya viewport. Learn how this

improved our animatic process and helps us make better animated movies. We'll show the tools in action and show the progression of a shot from standard Maya to final animatic look, and will compare the result with a production Renderman render. We'll also walk you through the GLSL shader render passes it uses to do deferred lighting and shadowing.

Speaker: David Adler, Walt Disney Animation Studios

Topics: Film, Digital Content Creation (DCC)

Time: Wednesday, September, 22nd, 17:00 - 17:20