

GPU Technology Conference 2010 Sessions on Video Processing (subject to change)

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2095 - Building High Density Real-Time Video Processing Systems

Learn how GPU Direct can be used to effectively build real time, high performance, cost effective video processing products. We will focus especially on how to optimize bus throughput while keeping CPU load and latency minimal.

Speaker: Ronny Dewaele, Barco

Topics: Video Processing, Imaging

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

2029 - Computer Vision Algorithms for Automating HD Post-Production

Discover how post-production tasks can be accelerated by taking advantage of GPU-based algorithms. In this talk we present computer vision algorithms for corner detection, feature point tracking, image warping and image inpainting, and their efficient implementation on GPUs using CUDA. We also show how to use these algorithms to do real-time stabilization and temporal re-sampling (re-timing) of high definition video sequences, both common tasks in post-production. Benchmarking of the GPU implementations against optimized CPU algorithms demonstrates a speedup of approximately an order of magnitude.

Speaker: Hannes Fassold, JOANNEUM RESEARCH

Topics: Computer Vision, Video Processing

Time: Wednesday, September, 22nd, 15:00 - 15:50

2125 - Developing GPU Enabled Visual Effects For Film And Video

The arrival of fully programmable 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

Elemental Technologies, Inc.

Elemental Technologies is the leading provider of massively parallel video processing solutions for broadcast and online video customers. Elemental's products use off-the-shelf, programmable graphics processing units (GPUs) for compute-intensive video processing tasks. The product line is ideal for digital media workflows that require video encoding for Internet and mobile distribution.

Speaker: Sam Blackman, Elemental Technologies, Inc.

Topics: Video Processing, Computer Graphics

Time: To Be Determined

4004 - Emerging Companies: CEO on Stage featuring Cooliris, Jedox Business Intelligence, and Playcast

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 Cooliris, Empulse, and Playcast - covering the fields of computer graphics, video processing and data mining.

Panelists will include Drew Lanza (Partner, Morgenthaler), Charles Carmel (Cisco), and Nathan Brookwood (Principal Analyst, Insight64).

Speakers: Drew Lanza, Morgenthaler, Natan Peterfreund, Playcast Media Systems, Nathan Brookwood,

Insight 64, Charles Carmel, Cisco, Michael Hummel, empulse GmbH

Topics: General Interest, Databases & Data Mining, Video Processing, Computer Graphics

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

4001 - Emerging Companies: CEO on Stage featuring Elemental Technologies, Geomerics, and Milabra

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This CEO on Stage session will feature Elemental Technologies, Geomerics and Milabra - covering the field of computer graphics and video processing.

Panelists for this session will include Dan’l Lewin (Corporate VP, Microsoft), Flip Gianos (Partner, Interwest), and Jon Peddie (President, JPR).

Speakers: Dan’l Lewin, Microsoft, Jon Peddie, Jon Peddie Research, Flip Gianos, InterWest Partners, Sam Cox, Milabra, Sam Blackman, Elemental Technologies, Inc., Chris Doran, Geomerics

Topics: General Interest, Video Processing, Computer Graphics

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

2173 - Enabling Large-Scale CCTV Face Recognition

Learn how to use CUDA and GPGPU to perform large scale face search for both forensics as well as CCTV face recognition.

Speaker: Abbas Bigdeli, NICTA

Topics: Computer Vision, Video Processing

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 will 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

2087 - Fast High-Quality Panorama Stitching

We present a panorama stitching application implemented with CUDA C on the GPU. The image processing pipeline consists of SIFT feature detection and matching and Graphcut image stitching to achieve high-quality results. We demonstrate live panorama creation with a Webcam.

Speaker: Timo Stich, NVIDIA

Topics: Video Processing, Algorithms & Numerical Techniques, Computer Vision, Imaging

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

2051 - GPGPU in Commercial Software: Lessons From Three Cycles of the Adobe Creative Suite

Learn about leveraging GPUs for commercial software. We will discuss lessons learned creating and using the Adobe Image Foundation libraries to accelerate image and video processing using GPUs and multi-core. These libraries are used by most of Adobe's applications as well as integrated by hobbyist and professional applications with different levels of experience with GPUs and diverse user bases.

Speaker: Kevin Goldsmith, Adobe Systems, Incorporated

Topics: Imaging, Video Processing

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

2224 - GPU Acceleration in Adobe Creative Tools

Hear experts explain how Adobe Creative Suite 5 harnesses the power of CUDA technology in several of its core software applications. We will focus on the complete redesign of the core video playback and rendering engine in Adobe Premiere Pro CS5 and how it uses the power of GPUs to deliver superior performance and change the game for Adobe in professional video production.

Topics: Video Processing, Imaging

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

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

2075 - GPU-Accelerated Video Encoding

Learn how to accelerate video encoding using the GPU. We will give an overview of the typical video encoding pipeline and discuss how different parts of the pipeline can be ported to GPU using various approaches. We will focus on block-based Motion Estimation, in particular, as it is the corner stone of video encoding algorithms. The efficiency of its implementation on the GPU is crucial to the speed and quality of the encoder.

Speaker: Anton Obukhov, NVIDIA

Topic: Video Processing

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

2027 - GPU-Based Image Processing in Military Applications

There are more than 6000 Unmanned Aerial Vehicles (UAVs) in use in the US Military. The US Army alone has flown more than 1 million UAV flight hours. Every UAV captures at least one stream of video; some as many as 9. All this video needs to be processed and analyzed both during the mission, and post-mission. Traditionally, custom ASICs, and FPGAs were required for even the most rudimentary image processing tasks. Now, GPUs provide orders of magnitude more compute at a fraction of the cost. Hear how MotionDSP uses GPUs to provide previously impossible capabilities to military imaging.

Speaker: Sean Varah, MotionDSP Inc.

Topics: Video Processing, High Performance Computing

Time: Thursday, September, 23rd, 09:00 - 9:50

2048 - H.264/AVC Video Encoding with CUDA and OpenCL

Join experts from MainConcept, a leading provider of video codecs to the professional market, as they demonstrate the latest version of their CUDA-based H.264/AVC Encoder.

Speaker: Thomas Kramer, MainConcept

Topics: Video Processing, Tools & Libraries

Time: Thursday, September, 23rd, 09:00 - 9:50

2121 - Maximizing Throughput of Barco's GPU-Enabled Video Processing Server

Find out how Imec middleware realizes the full potential of GPU-enabled video processing servers to manage multiple video processing pipelines. We will discuss how the middleware monitors GPU and CPU execution to best balance the load. Covers how we achieved a 30% increase in throughput with only a minimal 0.05% overhead on Barco's GPU-enabled video processing server.

Speakers: Maja D'Hondt, imec, Roel Wuyts, imec

Topics: Video Processing, Tools & Libraries

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

2161 - NVIDIA Quadro Digital Video Pipeline Overview

This session will provide an overview of the Quadro Digital Video Pipeline. It will cover a description of the DVP components, application architectures software architectures, and programming resources available.

Speaker: Thomas True, NVIDIA

Topics: Computer Graphics, Video Processing, Programming Languages & Techniques

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

2159 - Programming the NVIDIA Digital Video Pipeline with Direct3D (Pre-Conference Tutorial)

Learn how to program the NVIDIA Quadro Digital Video pipeline using Direct3D. This session will provide an overview of the SDK, discuss device control, data transfers, performance measuring and tuning, ancillary data and application design considerations.

Speaker: Thomas True, NVIDIA

Topics: Programming Languages & Techniques, Video Processing, Computer Graphics

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

2158 - Programming the NVIDIA Digital Video Pipeline with OpenGL (Pre-Conference Tutorial)

This tutorial session teaches attendees how to program the NVIDIA Quadro Digital Video Pipeline with OpenGL. It will go in-depth into the techniques and recommended practices.

Speaker: Thomas True, NVIDIA

Topics: Programming Languages & Techniques, Video Processing, Computer Graphics

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

2003 - Using CUDA to Accelerate Radar Image Processing

Come see how current GPU technology provides the means for the first portable real-time radar image processing algorithm. This session will outline how the GPU has afforded nearly three orders of magnitude improvement in performance for Synthetic Aperture Radar's (SAR) hallmark image processing algorithm. We will present algorithm details and further improvements.

Speakers: Richard Carande, Neva Ridge Technologies, Aaron Rogan, Neva Ridge Technologies

Topics: Signal processing, Algorithms & Numerical Techniques, Imaging, Video Processing

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

2016 - VDPAU: PureVideo on Unix

Learn about VDPAU (Video Decode and Presentation API for Unix). VDPAU provides GPU-accelerated video decoding, post-processing, UI compositing, and display on Unix. VDPAU also supports sharing surfaces with OpenGL and CUDA ("interop"). This allows developers to implement their own post-processing algorithms or scene analysis, or to use decoded video surfaces as part of a scene rendered using OpenGL.

Speaker: Stephen Warren, NVIDIA

Topics: Video Processing, Tools & Libraries

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