EGPGV 2017

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Table of Contents

Table of Contents iii

Preface iv

Keynote v

International Program Committee vi

Author Index vii

Performance Modeling and Optimization

PaViz: A Power-Adaptive Framework for Optimizing Visualization Performance 1
Stephanie Labasan, Matthew Larsen, Hank Childs, and Barry Rountree

Prediction of Distributed Volume Visualization Performance to Support Render Hardware Acquisition 11
Gleb Tkachev, Steffen Frey, Christoph Müller, Valentin Bruder, and Thomas Ertl

Progressive CPU Volume Rendering with Sample Accumulation 21
Will Usher, Jefferson Amstutz, Carson Brownlee, Aaron Knoll, and Ingo Wald

Exploratory Techniques

Photo-Guided Exploration of Volume Data Features 31
Mohammad Raji, Alok Hota, Robert Sisneros, Peter Messmer, and Jian Huang

A Space-Efficient Method for Navigable Ensemble Analysis and Visualization 41
Alok Hota, Mohammad Raji, Tanner Hobson, and Jian Huang

Interactive Exploration of Dissipation Element Geometry 53
Tom Vierjahn, Andrea Schnorr, Benjamin Weyers, Dominik Denker, Ingo Wald, Christoph Garth, Torsten W. Kuhlen, and Bernd Hentschel

Alternative Programming Model Techniques

A Task-Based Parallel Rendering Component For Large-Scale Visualization Applications 63
Tim Biedert, Kilian Werner, Bernd Hentschel, and Christoph Garth

Achieving Portable Performance For Wavelet Compression Using Data Parallel Primitives 73
Shaomeng Li, Nicole Marsaglia, Vincent Chen, Christopher Sewell, John Clyne, and Hank Childs

Preface

This book contains the proceedings of the 17th Eurographics Symposium on Parallel Graphics and Visualization (EGPGV), which took place in Barcelona, Spain, on the 12th and 13th of June, 2017.

In this day and age, high-performance graphics and visualization solutions are required in a variety of domains, ranging from making sense of the huge amounts of data coming out of simulations and sensing devices, to delivering real-time immersive experiences that simulate virtual worlds. Such systems are implemented on hardware platforms that are rapidly increasing in complexity, in terms of increasing concurrency, heterogeneity, and depth of memory and storage hierarchies. These factors present unique challenges, to which our community responds with novel methods and approaches for parallel and high-performance graphics and visualization. The EGPGV symposium aims to foster the exchange of experiences and knowledge exploiting and defining new trends in this important computer science area.

The papers program presents contributions that introduce novel parallel systems and techniques. This year, we received a total of 13 high-quality submissions, each of which underwent extensive review by a diverse International Program Committee, consisting of 29 persons from around the world having broad and deep expertise in parallel graphics and visualization. Each contribution was independently reviewed by at least three IPC members, selected by the chairs according to their preferences, expertise, and conflicts. The members were assigned as either primary or secondary reviewers. After all the reviews were completed, the primary reviewer of each contribution led an online discussion among all co-reviewers and was responsible for writing a summary review and recommendation. This active discussion clarified issues with the papers and helped develop consensus about decisions. Based on the reviewers' recommendations, the individual reviews, the online discussions, and after a thorough deliberation by the program co-chairs, 8 of the 13 submissions were selected for inclusion in the final program, which corresponds to an acceptance rate of 61%.

This year's papers program covers a variety of subjects, including the efficient processing and generation of geometric data in GPU environments, the efficient management of large datasets in distributed settings, and the optimization of parallel graphics applications through the creation of efficient workflows.

This year's keynote was jointly delivered by two researchers from NVIDIA's Advanced Rendering Center (ARC) in Berlin, Germany: Tom-Michael Thamm and Marc Nienhuis. They presented recent results that seamlessly blend simulation and data visualization using NVIDIA's IndeX technology, and demonstrated these for computational mechanics applications.

We would like to thank Stefanie Behnke (Eurographics) and Meghan Haley (IEEE) for their help with handling the publications and invaluable assistance with the reviewing system, respectively. We would also like to thank Markus Huber (Univ. of Stuttgart, Germany) for his assistance with the EGPGV website. Finally, we would like to thank all the members of the IPC, the external reviewers, our sponsors, the authors, and the keynote speaker without whom this symposium would not have been possible.

Fernando Cucchietti, Janine Camille Bennett, and Alexandru Telea
Barcelona, Spain, June 2017

Keynote

NVIDIA IndeX - A Scalable HPC Visualization SDK for Computational Mechanics and Data Analytics

Tom-Michael Thamm *Marc Nienhaus*

NVIDIA Advanced Rendering Center (ARC), Berlin, Germany

Abstract

NVIDIA IndeX is a GPU cluster software solution for scalable scientific visualization. The scalability enables real-time high-quality rendering of large-scale data at any resolution in combination with in-situ technology. The novel 3D visual interactive inspection of time-varying or simulation data gives scientists unique insights. Amongst others, the key note outlines the combination of BSC's ALYA with the NVIDIA IndeX SDK in the field of mechanical simulation.

Short Biography of the Speakers

Tom-Michael Thamm is Director for Software Product Management at NVIDIA Advanced Rendering Center (ARC) in Berlin, Germany and is responsible for all software products, such as NVIDIA IndeX, NVIDIA Iray. He is managing and coordinating with his team the customer support as well as the general product definition and positioning. Mr. Thamm worked before NVIDIA ARC for mental images. He is for over 25 years in the 3D visualization business. He has led several key software projects and products, such as the NVIDIA IndeX product for large volume visualization. He has studied Mathematics.

Dr. Marc Nienhaus is the Product Technology Lead of the NVIDIA IndeX commercial software at NVIDIA. He is managing the NVIDA IndeX software engineering team and is responsible for the NVIDIA IndeX product architecture and the development of applications in various application domains. Before joining mental images' R&D rendering department and NVIDIA ARC, Marc researched as a post-doc at the Northwestern University (IL, USA) and led research projects at the University of Potsdam. His research interests include parallel and distributed rendering and computing, scientific visualization, GPU-based rendering, and photorealistic and non-photorealistic expressive depictions. Marc holds a master in Mathematics with a minor in Computer Science from the University of Muenster and a PhD in Computer Science from the Hasso Plattner Institute at the University of Potsdam. Marc has published various papers on GPU-based real-time and non-photorealistic rendering techniques.

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Author Index

Amstutz, Jefferson 21
Biedert, Tim 63
Brownlee, Carson 21
Bruder, Valentin 11
Chen, Vincent 73
Childs, Hank 1, 73
Clyne, John 73
Denker, Dominik 53
Ertl, Thomas 11
Frey, Steffen 11
Garth, Christoph 53, 63
Hentschel, Bernd 53, 63
Hobson, Tanner 41
Hota, Alok 31, 41
Huang, Jian 31, 41
Knoll, Aaron 21
Kuhlen, Torsten W. 53
Labasan, Stephanie 1
Larsen, Matthew 1
Li, Shaomeng 73
Marsaglia, Nicole 73
Messmer, Peter 31
Müller, Christoph 11
Raji, Mohammad 31, 41
Rountree, Barry 1
Schnorr, Andrea 53
Sewell, Christopher 73
Sisneros, Robert 31
Tkachev, Gleb 11
Usher, Will 21
Vierjahn, Tom 53
Wald, Ingo 21, 53
Werner, Kilian 63
Weyers, Benjamin 53