

JEFFERY A. STUART

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PH.D. FOCUS

The focus of my Ph.D. work is on multi-CPU, multi-GPU clusters. In particular, I am focusing on methods to make the GPU a first-class primitive for scientific computing, gaming applications, and eventually general purpose computing. In a broader sense, my work encompasses heterogeneous computing and strives to push the technology and understanding to as high a level as possible.

EDUCATION

University of California, Davis
Ph.D. Computer Science
G.P.A. 4.0 / 4.0 (Higher is Better)

Davis, CA
In Progress

Emphasis: Heterogeneous and Parallel Computing, GPU Computing, Scientific Visualization
Major Courses: Global Illumination, Digital Architecture, Scientific Visualization, Volume Visualization, Machine Learning, Information Visualization

University of Nevada, Reno
M.S. Computer Science
G.P.A. 4.0 / 4.0 (Higher is Better)

Reno, NV
2005 August

Emphasis: Parallel Computing, Virtual Reality, Cross-platform Software Development
Major Courses: Parallel Computing, Advanced Computer Graphics, Advanced Algorithms, Computer Network Systems, Database Systems, Artificial Intelligence, Computer Network & System Administration

University of Nevada, Reno
B.B. Computer Science
G.P.A. 3.7 / 4.0 (Higher is Better)

Reno, NV
2003 December

Relevant Courses: Probability & Statistics, Microprocessor Engineering, Operating Systems, Programming Languages & Models, Software Engineering, Data Communication & Computer Networks, Compiler Construction, Analysis of Algorithms

EXPERIENCE

Max Planck Institut für Informatik
Visiting Researcher
Worked on high-performance computing library for heterogeneous platforms.
Supervisor: Robert Strzodka (strzodka@mpi-inf.mpg.de)

Saarbrücken, DE

2009 April – 2009 June

NVIDIA Research
Research Intern
CUDA and GPU-Computing Research.
Supervisors: David Luebke (dluebke@nvidia.com) and Michael Cox (mcox@nvidia.com)

Santa Clara, CA

2009 January – 2009 March

Google
Google Earth Intern
Worked on Google Earth for the iPhone.
Supervisor: David Kornmann (dkornmann@google.com)

Mountain View, CA

2008 June – 2008 August

Google
Platforms Engineering Intern
Worked on internal tools for profiling and optimizing clustered applications at Google.
Supervisor: Carole Dulong (cdulong@google.com)

Mountain View, CA

June 2007 – October 2007

NVIDIA Corp.
OpenGL Driver Intern
Worked on GPU driver for Apple systems.
Supervisor: Eric Klein (eklein@nvidia.com)

Santa Clara, CA

June 2006 - 2006 September

International Game Technology
Firmware Engineering Intern
Worked on internal libraries and tools, developed games, debugged various hardware and software problems.
Supervisor: Jim Vasquez +1 (775) 448-7777

Reno, NV

2001 June - 2004 September

PUBLICATIONS Jeff A. Stuart and John D. Owens. *Multi-GPU MapReduce on GPU Clusters*. To Appear *International Parallel and Distributed Processing Symposium (IPDPS)*, May 2011.

Jeff A. Stuart, Michael Cox, and John D. Owens. *GPU-to-CPU Callbacks*. In *UnConventional High-Performance Computing 2010* as part of the *EuroPar 2010 Workshop Series*. September 2010.

Jeff A. Stuart, Cheng-Kai Chen, Kwan-Liu Ma, and John D. Owens. *Multi-GPU Volume Rendering using MapReduce*. In *MAPREDUCE '10, The First International Workshop on MapReduce and its Applications*. as part of the *High-Performance and Distributed Computing 2010 Workshop Series*. June 2010.

Jeff A. Stuart and John D. Owens. *Message Passing on Data-Parallel Architectures*. In *Proceedings of the 23rd IEEE International Parallel and Distributed Processing Symposium*, May 2009.

Brian Budge, Tony Bernardin, Jeff A. Stuart, Shubhabrata Sengupta, Kenneth I. Joy, and John D. Owens. *Out-of-core Data Management for Path Tracing on Hybrid Resources*. In *Computer Graphics Forum (Proceedings of Eurographics 2009)*, 28(2):385–396, April 2009.

Jeff A. Stuart, Joseph Jaquish, Scott Bassett, Frederick Harris, and William Sherman. *An Interactive Visualization Method for Integrating Digital Elevation Models and Geographic Information Systems Vector Layers*. In *Proceedings of International Symposium of Visual Computing 2005*, December 5–7, 2005. Lake Tahoe, NV.

Jeff A. Stuart. *A Unified Approach for Cross-Platform Software Development*. Masters Thesis, University of Nevada, Reno.

John D. Studebaker, Justin T. Gerthoffer, David D. Colborne, Jeff A. Stuart, Frederick C. Harris, Jr. *Thraxion: Three-Dimensional Action Simulator*. In *Proceedings of the 2005 International Conference on Software Engineering Research and Practice (SERP 05)*, June 27–30, 2005, Las Vegas, NV.

Jeff A. Stuart, Sergiu M. Dascalu, and Frederick C. Harris, Jr. *Towards a Unified Approach for Cross-Platform Software Development*. In *Proceedings of the 14th International Conference on Intelligent and Adaptive Systems & Software Engineering (IASSE-2005)*, Toronto, Canada, July 20–22, 2005, pp. 235–242.

Deanna M. Needell, Jeff A. Stuart, Tamara C. Thiel, Sergiu M. Dascalu, and Frederick C. Harris, Jr. *Software Requirements Specification for a University Class Scheduler*. In *Proceedings of The 2003 International Conference on Software Engineering Research*

and Practice (SERP 03), June 23–26, 2003, pp. 490–496.

RESEARCH

Present (Began 2010 Fall): Persistent Threads on GPUs.

Present (Began 2010 Summer): Full-scale implementation of MPI on GPU clusters.

2010 Fall (Began 2010 Winter): MapReduce on GPU-based clusters.

2010 Winter (Began 2009 Winter): Parallel Volume Rendering of massive data with CUDA and MPI.

2009 Spring: Library for easier cross-development on multiple types of heterogeneous systems.

2009 Winter: GPU–CPU callbacks.

2008 Fall (Began 2007 Fall): Message Passing on GPUs and GPU-based clusters.

2007 Winter: Distributed system for illumination of tetrahedron-based volumetric datasets.

2008 Fall (Began 2006 Fall): Distributed system for global illumination of massive datasets.

2007 Fall (Began 2006 Fall): Distributed KD-tree construction for massive datasets.

2006 Spring (Began 2006 Winter): Virtual Reality visualization of noisy, volumetric data.

2005 Spring (Began 2005 Winter): Distributed load-balancer for programmatically sub-dividable jobs.