

Jay Edward Steele, PhD

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Summary

Computer scientist interested in solving complex problems that demand high quality work, self-motivation, and novel techniques. Experienced in developing, understanding, and optimizing various algorithms in multiple domains, specifically graphics.

Experience

SOFTWARE ENGINEER, INTEL CORPORATION *August 2009 - Present*
Consults with DreamWorks Animation to optimize core rendering applications for Intel architecture and investigate next-generation software and hardware parallel technologies.

RESEARCH ASSISTANT, CLEMSON UNIVERSITY *August 2005 - August 2009*
Researched new simulation techniques for cloud rendering and forest illumination based on Lattice-Boltzmann methods utilizing GPU-based clusters, built on top of CUDA, for fast computation.

INTERN, WETA DIGITAL *Summer 2008*
Introduced CUDA and explored its uses in production pipeline. A new tool was developed, using CUDA, that allowed much faster waterfall simulation and improved artist workflow.

INTERN, INTEL *Summer 2006*
Performed software rasterizer maintenance and performance analysis for Intel's Larrabee GPU project.

GRADUATE PROJECTS, CLEMSON UNIVERSITY
Rigid body simulations, photon mapping, particle systems, GPGPU w/ GLSL, real-time rendering w/ OpenGL, Linux kernel development (disk scheduling, networking, video card driver), custom-language compiler

Skills

Proficient in C++, C, CUDA; Experience with Python, Java, Javascript
MPI, OpenMP, Pthreads, TBB, Boost Threads
CPU Optimization: Vectorization, Profiling w/ VTune Performance Analyzer
GPU Optimization
Intel Compiler, GCC
Linux development, Windows development
OpenGL, GLSL

Education

PhD Computer Science, Clemson University, August 2009

BS Computer Science, Duke University, May 2001, *Magna Cum Laude*

Dissertation

FAST RENDERING OF FOREST ECOSYSTEMS WITH DYNAMIC GLOBAL ILLUMINATION

A new global illumination algorithm, based on lattice-Boltzmann methods, allows fast cinematic relighting of complex forest ecosystems. Visibility is determined through ray tracing, implemented with CUDA. Current results allow cinematic relighting of large forest scenes (> 100 million triangles) at near real-time frame-rates.

Publications

RELIGHTING FOREST ECOSYSTEMS

J. Steele and R. Geist

Proc. 5th Int. Symp. on Visual Computing, (ISVC 2009), Las Vegas, Nevada, November, 2009, pp. 55-66.

A LIGHTING MODEL FOR FAST RENDERING OF FOREST ECOSYSTEMS

R. Geist and J. Steele

Proc. IEEE/EG Symposium on Interactive Ray Tracing (RT08), Los Angeles, CA, August 2008, pp. 99-106, back cover.

PARALLEL PROCESSING FLOW MODELS ON DESKTOP HARDWARE

R. Geist, Z. Jones, and J. Steele

Proc. of the 46th Annual ACM SE Conf., Auburn, AL, March, 2008.

CONVECTIVE CLOUDS

R. Geist, J. Steele, and J. Westall

Eurographics Workshop on Natural Phenomena, Prague, Czech Republic, Sept., 2007, pp. 23-30,83.

SECOND-ORDER ILLUMINATION IN REAL-TIME

R. Cochran and J. Steele

Proc. of the 45th Annual ACM SE Conf., Winston-Salem, NC, March, 2007.

Honors and Awards

School of Computing Outstanding Graduate Student Researcher, Clemson University, 2008-2009.

NVIDIA Fellowship award, 2008-2009.

NVIDIA Fellowship award, 2007-2008.

School of Computing Outstanding Ph.D. Student, Clemson University, 2006-2007.

Best Student Paper, ACM SE Conf., March, 2007.

NVIDIA Fellowship award, 2006-2007.

Posters, Talks

EVOLVING THE GPU-BASED CLUSTER

J. Steele

SC'07 ACM Student Research Competition, Reno, Nevada, Nov., 2007.

INTRODUCTION TO GPGPU PROGRAMMING

R. Cochran and J. Steele

45th Annual ACM SE Conf., Winston-Salem, NC, March, 2007.