

Scott Grauer-Gray

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SUMMARY

PHD student with research publications, industry and teaching experience, and a record of academic excellence. Primary research interests are GPU computing, program optimization, compilers, machine learning, and computer vision.

EDUCATION

PHD Student in Computer and Information Sciences (CISC), University of Delaware, Newark, DE; September 2006-present
Advisor: Dr. John Cavazos
GPA: 3.9 / 4.0

Bachelor of Science in Computer Science, minor in math, University of Massachusetts, Amherst, MA; September 2002-August 2006
Graduated Summa Cum Laude with a GPA of 3.8/4.0

COMPUTER SKILLS

C/C++, CUDA, OpenCL, Python, Java, Matlab, Microsoft Visual Studio, SQL, Eclipse, Lisp, OpenGL, OpenCV, ImageJ, HTML

INDUSTRY EXPERIENCE

Intern

nVidia, summer 2011

Worked on NPP CUDA library, specifically on optimizing functions used for parallel processing of 1D signals; these functions implemented addition, division, exponent, square root, and arctan operations on each signal element.

Intern

Intel, July 2013-July 2014

Worked on proof-of-concept project using Intel graphics. Included work in computer vision, OpenCL, and application optimization across different hardware.

RESEARCH EXPERIENCE

Statistical Machine learning for ARchitecture and compilaTion (SMART) Lab (run by Dr. John Cavazos), University of Delaware: June 2009 – present

Worked on code transformations to optimize CUDA kernels which are run on the GPU, including using different modes of storage (local memory, shared memory, and registers) and loop unrolling, and applying these transformations to optimize CUDA belief propagation implementation. Working on framework to generate code transformations to optimize any given CUDA or OpenCL program using directives in the HMPP toolkit from CAPS Enterprise. Working on using GPUs (and possibly other accelerators) to speed up financial applications.

**Video/Image Modeling and Synthesis Laboratory (run by Dr. Chandra Kambhamettu),
University of Delaware: September 2006-June 2009**

Worked on tracking the motion of sea ice from satellite imagery, traveled to APLIS '07 ice camp in the arctic as part of that work. Implemented stereo/motion algorithms with the goal of tracking cloud motion from a sequence of satellite imagery, and explored taking advantage of the GPU for real-time processing; developed a GPU belief propagation implementation using CUDA which can be applied to stereo processing and motion estimation. Modified belief propagation implementation to use less storage without significantly impacting output accuracy.

PUBLICATIONS

- S. Grauer-Gray, W. Killian, R. Searles, J. Cavazos. Accelerating Financial Applications on the GPU. To Appear in Sixth Workshop on General Purpose Processing using GPUs, 2013.
- S. Grauer-Gray, L. Xu, R. Searles, S. Ayalasomayajula, J. Cavazos. Auto-Tuning a High-Level Language Targeted to GPU Codes. Proceedings of Innovative Parallel Computing (InPar), 2012.
- Z. Yu, C. Thorpe, X. Yu, S. Grauer-Gray, F. Li, J. Yu. Dynamic Depth-of-Field on Live Video Streams: A Stereo Solution. In Computer Graphics International (CGI), 2011.
- S. Grauer-Gray, J. Cavazos. Optimizing and Auto-Tuning Belief Propagation on the GPU . In 23rd International Workshop in Languages and Compilers for Parallel Computing (LCPC), 2010.
- S. Grauer-Gray, C. Kambhamettu. Hierarchical Belief Propagation To Reduce Search Space Using CUDA for Stereo and Motion Estimation . In IEEE Workshop on Applications of Computer Vision (WACV), 2009.
- S. Grauer-Gray, C. Kambhamettu, K. Palaniappan. GPU Implementation of Belief Propagation Using CUDA for Cloud Tracking and Reconstruction. In 5th IAPR Workshop on Pattern Recognition in Remote Sensing (PRRS), 2008.

HONORS AND AWARDS

- Recipient of University of Delaware Graduate travel award in 2008 and 2009
- Dean's List at University of Massachusetts, Fall 2002 - Spring 2006

TEACHING EXPERIENCE

Instructor

University of Delaware, summer 2009

Taught CISC 101, an introductory computer science course titled “Computer and Information Systems”. Responsible for lectures, assignments, evaluation, assisting students in office hours, and supervising a TA.

Teaching Assistant (TA):

University of Delaware, January 2007-May 2010; September 2012-December 2012; September 2014-present

Held lab sessions, office hours, and graded assignments; served as TA for CISC 101, titled “Computer and Information Systems”, CISC 106, titled “General Computer Science for Engineers”, CISC 181, titled “Introduction to Computer Science II”, CISC 220, titled “Data Structures”, CISC 303, titled “Automata Theory”, CISC 320, titled “Introduction to Algorithms”, CISC 401/601, titled “Elements of the Theory of Computation”, CISC 481/681, titled “Artificial Intelligence”, and (currently) CISC 440/640, titled “Computer Graphics”.

Tutor:

University of Massachusetts, September 2003-May 2006

Tutored undergraduate students in a variety of courses, including computer science, calculus, physics, and statistics.

COURSEWORK

Graphics and Vision: Computer Graphics, Computer Vision, Computational Photography, Rendering and Image Synthesis, Computational Geometry

Systems: Operating System, Computer Architecture, Compiler Construction, Program Analysis and Transformation, Computer Networks, Multicore Architectures

AI and Learning: Artificial Intelligence, Computational Linguistics

Theory: Algorithm Design and Analysis, Elements of Theory of Computational

ASSOCIATIONS

- Computer and Information Sciences Graduate Student Association, President from Jan 2009-Jan 2010, member from Feb. 2009-2012
- IEEE Student Member, November 2009-present

References available upon request