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Objectives

To apply my skills as a software engineer at a leading software development company. My interests include high-level language compilers, computer graphics, and high-performance, heterogeneous computing systems. My research has focused on optimizing GPU device code and discovering SIMD parallelism in applications.

Education

The Ohio State University	Columbus, OH
Ph.D. in Computer Science and Engineering (expected)	September 2007 - Current
Focus: GPU Code Optimization	
GPA: 3.759	
Expected Graduation: Summer 2012	

The Ohio State University	Columbus, OH
Master of Science in Computer Science and Engineering	December 2011
Focus: GPU Code Optimization	
GPA: 3.759	

The Ohio State University	Columbus, OH
Bachelor of Science in Computer Science and Engineering	September 2003 - June 2007
Focus: Software Systems	
GPA: 3.854	

Skills

Programming Languages

C, C++, C#, Objective-C(++), Java, HLSL, GLSL, Cg, OpenCL, CUDA, Python, Bash, Ocaml, Haskell, \LaTeX

Operating Systems

Linux (Red Hat, Ubuntu), Mac OS X, Microsoft Windows, Android

Software APIs

Direct3D (9, 10, 11), OpenGL (2.x, 3.x, ES 2.0), LLVM, Windows API, POSIX API, Cocoa, Boost, Android NDK

Software Packages

Apple Xcode, Microsoft Visual Studio, Git, Mercurial, Subversion, Slurm

Network Administration

Administered research network of machines for benchmark purposes, including all hardware and software management. Network was composed of Red Hat Enterprise Linux machines, and included diverse sets of CPU and GPU components, as well as NFS file sharing, NIS authentication and cluster resource management with Slurm.

Awards and Accomplishments

Microsoft DirectX/XNA MVP

Years: 2008 and 2009

Awarded for time spent helping the XNA Framework community

NVidia PTX Backend for LLVM (on-going) - <http://llvm.org>

Led the effort to develop an open-source nVidia PTX backend for the LLVM project

Google Summer of Code

Year: 2011

Funded part of the work on the LLVM PTX backend

Distinguished University Fellowship - Ohio State University

Award Years: 2007 and 2012

Awarded for first and dissertation year expenses plus stipend

Professional Experience

nVidia Corporation

CUDA Compiler and Tools - Student Intern

(Expected)

Start Date: March 19, 2012

Santa Clara, CA

March 2012 - June 2012

American Electric Power

Software Integration - Energy Trading - Student Intern

Accomplishments

- Helped update integration infrastructure
- Developed time-saving tools for business analysts

Languages: Java, C#, C++, ASP, JSP, SQL

Columbus, OH

June 2004 - January 2007

Research

Stencil Code Optimization for GPUs

Goal: Optimize stencil computations on GPU architectures by developing a code generation and optimization framework. Generate efficient, tiled OpenCL device and host code by trading redundant computation for a decrease in the required communication.

Analysis of the Vectorizability of Code through Dynamic Analysis

Goal: Utilize dynamic analysis techniques to analyze the inherent vectorizability of programs. Use the results of this analysis to drive both manual and semi-automatic code transformations to improve the performance of existing code.

Hardware Support for Efficient Memory Leak and Bloat Detection

Goal: Design extensions to existing micro-processor architectures that allow for efficient memory use tracking to aid in the detection of memory leaks and bloat. Such hardware should trade minimal performance impact for the ability to discover inefficient uses of memory in production scenarios.

Publications

Justin Holewinski, Naznin Fauzia, Mahesh Ravishankar, Louis-Noël Pouchet, Atanas Rountev, P. Sadayappan
Dynamic Trace-Based Analysis of Vectorization Potential of Applications. In Proceedings of the 33rd ACM Conference on Programming Language Design and Implementation (PLDI) (To Appear), Beijing, China. June 11-16, 2012.

Jeswin Godwin, Justin Holewinski, P. Sadayappan

High-Performance Sparse Matrix-Vector Multiplication on GPUs for Structured Grid Computations. In Proceedings of the 5th Workshop on General-Purpose GPUs (GPGPU) (To Appear), London, UK. March 3, 2012.

References

Available upon request