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Wei Wang

Education

August 2016 **Ph.D. in Computer Science**, *University of Delaware*, Newark, DE.
- Performance, Power, and Energy Tuning Using Hardware and Software Techniques for Modern Parallel Architectures
- Advisor: John Cavazos, Ph.D.

May 2011 **M.S. in Computer Science**, *University of Delaware*, Newark, DE.

June 2009 **B.E. in Computer Science**, *Huazhong University of Science and Technology*, Wuhan, China.

Experience

Sep 2016 –current **Software Development Engineer**, *Intel Corporation*, Santa Clara, CA.
- Optimizing software frameworks for better performance on Intel Xeon and Xeon Phi architectures

Sep 2010 –Aug 2016 **Research Assistant**, *University of Delaware*, Newark, DE.
- Power and Energy optimization of HPC applications on Intel architectures using combined software and hardware techniques
- Energy autotuning using polyhedral compiler frameworks for HPC kernels
- Fast acceleration of scientific applications on modern parallel architectures using OpenACC, CUDA, OpenMP, and OpenCL.

Oct 2015 –Dec 2015 **Research Intern**, *Renaissance Computing Institute*, Chapel Hill, NC.
- Minimizing application energy usage and determining different optimization strategies for different loops within an application

Summer 2015 **Intern Scholar**, *Lawrence Livermore National Laboratory*, Livermore, CA.
- Energy optimization on IBM's Power8 architecture using DVFS (Dynamic Voltage and Frequency Scaling) and concurrency throttling (i.e. reducing number of threads)
- Research OpenPower codes that enable energy management on Power8 architecture

Summer 2014 **Research Intern**, *Renaissance Computing Institute*, Chapel Hill, NC.
- Improved energy efficiency of OpenMP applications using CPU Clock Modulation and Concurrency Throttling on Intel architectures
- Compiled and modified the Linux kernel to add CPU Clock Modulation system call using inline assembly MSR instructions

Summer 2013 **Research Intern**, *Renaissance Computing Institute*, Chapel Hill, NC.
- Optimized Polybench and realistic applications for energy using polyhedral compilers
- Studied the relationship between execution time and energy consumption of applications on Intel Multi-Core and Many-Core architectures

Jan 2010 –Aug 2010 **Research Assistant**, *George Washington University*, Washington, DC.
- Large-Scale File System Analytics
- Implemented and improved a sampling based algorithm which analyzed large file systems quickly
- Reconstructed various file systems from Windows traces, ATT Plan 9 traces, Harvard NFS Traces, and Impression synthetic systems, and evaluated the resulting GLANCE application against all the file systems, one of which contained more than ONE BILLION inodes at the time

Publications - Conferences & Journals (peer-reviewed)

ICPP'15 **Wei Wang**, Allan Porterfield, John Cavazos, Sridutt Bhalachandra, "Using Per-Loop CPU Clock Modulation for Energy Efficiency in OpenMP Applications", The 44th IEEE International Conference on Parallel Processing, September 1-4, 2015.

PLoS-ONE'14 **Wei Wang**, Lifan Xu, John Cavazos, Howie H. Huang, Matthew Kay, "Fast Acceleration of 2D Wave Propagation Simulations Using Modern Computational Accelerators", PLoS ONE 9(1): e86484, 2014.

TOC'12 Howie H. Huang, Nan Zhang, **Wei Wang**, Gautam Das, Alex Szalay, "Just-In-Time Analytics on Large File Systems", IEEE Transactions on Computers, vol. 61, no. 11, pp. 1651-1664, Nov. 2012.

EMBC'11 **Wei Wang**, Howie H. Huang, Matthew Kay, John Cavazos, "GPGPU Accelerated Cardiac Arrhythmia Simulations", 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 30 - September 03, 2011.

FAST'11 Howie H. Huang, Nan Zhang, **Wei Wang**, Gautam Das, Alex Szalay, "Just-In-Time Analytics on Large File Systems", The 9th USENIX Conference on File and Storage Technologies, February 15-17, 2011.

Publications - Workshops (peer-reviewed)

PASA'16 **Wei Wang**, Allan Porterfield, John Cavazos, Sridutt Bhalachandra, "Compiler Transformations Meet CPU Clock Modulation and Power Capping", the 5th International Workshop on Power-aware Algorithms, Systems, and Architectures, in conjunction with ICPP'16, August 16, 2016.

VarSys'16 Allan Porterfield, Sridutt Bhalachandra, **Wei Wang**, Rob Fowler, "Variability: A Tuning Headache", 1st International Workshop on Variability in Parallel and Distributed Systems, in conjunction with IPDPS'16, May 23, 2016.

MultiProg'16 Lifan Xu, **Wei Wang**, Marco A. Alvarez, John Cavazos, Dongping Zhang, "Parallelization of Shortest Path Graph Kernels on Multi-Core CPUs and GPUs", Programmability Issues for Heterogeneous Multicores, in conjunction with HiPEAC'14, January 22, 2014.

IMPACT'14 **Wei Wang**, John Cavazos, Allan Porterfield, "Energy Autotuning using the Polyhedral Approach", 4th International Workshop on Polyhedral Compilation Techniques, in conjunction with HiPEAC'14, January 20, 2014.

E2SC'13 Allan Porterfield, Rob Fowler, Sridutt Bhalachandra, **Wei Wang**, "OpenMP and MPI Application Energy Measurement Variation", 1st International Workshop on Energy Efficient Super Computing, in conjunction with SC'13, November 18, 2013.

Posters (peer-reviewed)

SC'15 **Wei Wang** and Edgar A. Leon, "Evaluating DVFS and Concurrency Throttling on IBM's Power8 Architecture", IEEE/ACM International Conference for High Performance Computing, Networking, Storage and Analysis, November 17, 2015.

SEAK'14 William Killian, **Wei Wang**, Eunjung Park and John Cavazos, "Energy Tuning of Polyhedral Kernels on Multicore and Many-Core Architectures", SEAK: DAC Workshop on Suite of Embedded Applications and Kernels, June 1, 2014.

Talks

02/2016 **Wei Wang**, "Optimizing and Auto-Tuning HPC Applications for Energy Efficiency", Intel Corporation, Santa Clara, CA (Invited Talk)

Teaching Experience

Spring 2016	Teaching assistant for Parallel Programming undergraduate class, University of Delaware
Spring 2015	Teaching assistant for Parallel Programming undergraduate class, University of Delaware
Spring 2011	Teaching assistant for Data Structure undergraduate class, University of Delaware
Fall 2010	Teaching assistant for Advanced Compiler Construction graduate class, University of Delaware

Skills

Programming and Script Languages: C, Java, C++, Python, AWK, BASH
Parallel Frameworks: OpenMP, PThread, MPI, OpenACC, CUDA, OpenCL
Compiler Frameworks: GCC, ICC, PoCC, LLVM
Linux Kernel Systems: MSR, Inline Assembly, PMU
Storage Systems: File System Data Analytics

Awards

2015	Student Travel Award, ICPP'15
2015 & 2011	Professional Development Award, University of Delaware
2011	Student Travel Award, FAST'11

Services

Student volunteer for SC'15
Manuscript reviewer for IEEE Systems Journal, 2015
Industrial liaison committee member for PACT'13
Subreviewer: SC'15, PLDI'15, CloudCom'14, GPGPU7, PACT'13