

BENJAMIN I YLVISAKER

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EDUCATION

University of Washington

Ph.D., *Computer Science and Engineering*, 2004-2010.

Advisors: Carl Ebeling, Scott Hauck

Thesis topic: Programmability of massively parallel coprocessors, such as field-programmable gate arrays (FPGAs) and general purpose graphics processing units (GPGPUs). My thesis work enabled C-level programming of parallel coprocessors with innovations in compiler algorithms, feedback-directed optimization and concurrent programming language semantics.

Carnegie Mellon University

M.S., *Electrical and Computer Engineering*, 2003-2004.

Advisor: Herman Schmit

Thesis: Data Streaming and Dataflow Feedback in Sequential-Spatial Hybrid Processors

Carnegie Mellon University

B.S., University and College Honors, *Electrical and Computer Engineering*, minor in *Computer Science*; 2001.

TEACHING EXPERIENCE

Swarthmore College

Visiting Assistant Professor, 2013-2014.

Senior Conference (CS 97) and Introduction to Computer Science (CS 21).

Cornell University

Visiting Lecturer (effectively adjunct), 2012-2013.

Software Engineering (CS 5150) and Data Structures and Functional Programming (CS 3110).

Danang University of Technology, Vietnam

Instructor, Winter, 2010.

Computer Programming I & II.

University of Washington

Instructor, Autumn, 2007 and Summer, 2008.

Introduction to Digital Design and Translation of Programming Languages (Bothell Campus).

Teaching Assistant, Winter, 2006 and Spring, 2006.

Concepts and Tools for Software Development and Introduction to Digital Design.

Carnegie Mellon University

Lab and Teaching Assistant, Autumn 2000-Spring 2001.

Fundamentals of Computer Engineering.

INDUSTRY EXPERIENCE

GammaTech, Inc.

Senior Scientist, October 2010-July 2013, Ithaca, NY

GammaTech is a small software engineering tools company. My primary role was developing concurrency analyses (data races, deadlocks) in the context of GammaTech's static analysis bug finding tool. I also worked on proposals for government contracts and contributed to other projects as needed.

Recommendation available from David Melski (melski@grammatech.com).

IBM Research

Research Intern, June-September 2006, Yorktown Heights, NY

I worked in the C and Fortran compiler group at IBM Research, on an FPGA back-end for their production compiler.

Recommendation available from Kevin O'Brien (caomhin@us.ibm.com).

Silicon Möbius, Inc.

Software Engineer, September 2002-February 2003, Durham, NC.

Chameleon Systems, Inc.

Software Engineer, June 2001-August 2002, San Jose, CA.

PUBLICATIONS

B Ylvisaker and D Grossman, “An Operational Semantics for Explicitly Pipelineable C-like Languages”, *Draft*.

B Ylvisaker, C Ebeling and S Hauck, “Enhanced Loop Flattening for Generalized Software Pipelining”, *Draft*.

A Wood, A Knight, B Ylvisaker, S Hauck, “Multi-kernel floorplanning for enhanced CGRAs”, in *Field Programmable Logic and Applications (FPL)*, August, 2012.

B Ylvisaker and S Hauck, “Probabilistic auto-tuning for architectures with complex constraints”, in *Workshop on Adaptive Self-Tuning Computing Systems for the Exaflop Era*, June, 2011.

B Ylvisaker and S Hauck, “Software Engineering for Reconfigurable Computers”, in *The Encyclopedia of Software Engineering*.

S Friedman, A Carroll, B Van Essen, B Ylvisaker, C Ebeling and S Hauck, “SPR: An Architecture-Adaptive CGRA Mapping Tool”, in *International Symposium on Field-Programmable Gate Arrays (FPGA)*, February, 2009.

B Ylvisaker, B Van Essen, and C Ebeling, “A Type Architecture for Hybrid Micro-Parallel Computers”, in *IEEE Symposium on Field Programmable Custom Computing Machines (FCCM)*, April, 2006.

H Schmit, B Levine, and B Ylvisaker, “Queue Machines: Hardware Compilation in Hardware”, in *IEEE Symposium on Field Programmable Custom Computing Machines (FCCM)*, April 2002.

PRESENTATIONS

When Threads Attack!, Invited talk at the University of Montana, October, 2013.

Hazards of Multi-threaded and Multi-core Software Development, IEEE-sponsored webinar, March, 2012.

Tracing Data Flows to Find Concurrency Errors, Workshops on Spacecraft Flight Software, October, 2011.

Programmer-Guided Performance Tuning with Explicit Knobs, Cascadia Workshop on FPGAs, August, 2008.

Macah: A ‘C-Level’ Programming Language for Kernel Acceleration on Hybrid Micro-Parallel Architectures, Poster at *Languages, Compilers and Tools for Embedded Systems (LCTES)*, June, 2007 (with B Van Essen, C Ebeling, and D Grossman).

Macah: Simplifying the Programming of Kernel Accelerators with Judicious Automation, Cascadia Workshop on FPGAs, August, 2007.

A Type Architecture for Micro-Parallel Computers, poster at *ACM/SIGDA International Symposium on Field-Programmable Gate Arrays*, February, 2006 (with Brian Van Essen).

HONORS AND AWARDS

The Computer Science and Engineering Microsoft Endowed Fellowship for the 2006-7 academic year.

Departmental Research Assistant Fellowship, awarded by the Computer Science and Engineering Department of the University of Washington.