

Dana Vantrease

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Education

Ph.D., Computer Sciences August, 2010
Advisor: Mikko Lipasti University of Wisconsin - Madison
Dissertation Title: "Optical Tokens in Many-Core Processors."

M.S., Computer Sciences May, 2004
Advisor: Mikko Lipasti University of Wisconsin - Madison

B.S.E., Computer Science Engineering June, 2002
Magna Cum Laude Ohio State University

Employment

Senior Hardware Engineer Sept, 2016 - Present
Amazon Web Services - Annapurna Labs Austin, Texas
Tech Lead for AWS' Machine-Learning Inference chip modeling team. Responsible for design and development of cycle-approximate bit-accurate model that is used for SW Development, HW verification/validation, and performance/power prediction. Invented a testing methodology that generated random race-free multi-threaded programs, unveiling critical RTL bugs. Lead the technical evaluation of an IP purchase and owned the chip's errata. Performed duties as people manager, project manager, and Amazon mentor.

Staff Engineer Sept, 2010 - Sept 2016
Qualcomm Austin, Texas
Responsible for performance modeling of major Hexagon DSP blocks, including fetch unit, I/D/L2 caches, memory buses. Correlated the model to RTL, debugged system performance issues, and carried out architectural exploration experiments.

Intern Summer 2007 and Summer 2008
Hewlett-Packard Laboratories Palo Alto, CA
Studied applications of silicon photonics to on-chip interconnect arbitration and cache coherency, as a member of the Exascale lab led by Norm Jouppi. Publications have been cited 1300+ times.

Publications

"Atomic Coherence: Leveraging Nanophotonics to Build Race-Free Cache Coherence Protocols," Dana Vantrease, Mikko H. Lipasti, Nathan Binkert. In Proceedings of the 17th Annual IEEE International Symposium on High Performance Computer Architecture (HPCA-17), San Antonio, February 2011.

"Light Speed Arbitration and Flow Control for Nanophotonic Interconnects," Dana Vantrease, Nathan Binkert, Robert Schreiber, Mikko H. Lipasti. In Proceedings of the 42nd Annual IEEE/ACM International Symposium on Microarchitecture (MICRO-42), New York City, December 2009.

"Nanophotonic Barriers," Nathan Binkert, Al Davis, Mikko H. Lipasti, Robert Schreiber, Dana Vantrease. Workshop on Photonic Interconnects And Computer Architecture. Held in Conjunction with 42nd Annual IEEE/ACM International Symposium on Microarchitecture (MICRO-42), New York City, December 2009.

“Corona: System Implications of Emerging Nanophotonic Technology,” Dana Vantrease, Robert Schreiber, Matteo Monchiero, Moray McLaren, Norman P. Jouppi, Marco Fiorentino, Al Davis, Nathan Binkert, Raymond G. Beausoleil, and Jung Ho Ahn. In Proceedings of the 35th International Symposium on Computer Architecture (ISCA-35), Beijing, China, June 2008.

“An Evaluation of Server Consolidation Workloads for Multi-core Designs,” Natalie Enright Jerger, Dana Vantrease, and Mikko H. Lipasti. In Proceedings of the IEEE International Symposium on Workload Characterization (IISWC), Boston, MA, September 2007.

“Commod Bods and Frybread Power: Government Food Aid in American Indian Culture.” Dana Vantrease. In Journal of American Folklore. Volume 126, Number 499, Winter 2013.

Patents

Dana Vantrease, Ron Diamant, Thomas A. Volpe, Randy Huang, “Processing for multiple input data sets,” Filed 3/19.

Dana Vantrease, Ron Diamant, Thomas A. Volpe, Randy Huang, “Scheduling network computations,” Filed 3/18.

Benny Pollak, Dana Vantrease, Adi Habusha, “Integrated circuit with rate limiting,” Granted 7/20.

Dana Vantrease, Randy Huang, Ron Diamant, Thomas Elmer, Sundeep Amirineni “Accelerated quantized multiply-and-add operations,” Granted 6/20.

Ilya Minkin, Ron Diamant, Mohammad El-Shabani, Dana Vantrease, “Runtime augmentation of engine instructions,” Granted 5/20.

Dana Vantrease, Ron Diamant, “Performing concurrent operations in a processing element” Granted 10/19.

Dana Vantrease “Reducing traffic in hierarchical cache interconnects,” Granted 9/19.

Christopher Edward Koob, Dana M. Vantrease, “A write-only dataless state for maintaining cache coherency,” Granted 3/19.

Dana M. Vantrease, Christopher E. Koob, Erich J. Plondke, “System and method to reset a lock indication,” Granted 11/16.

Peter G. Sassone, Christopher Edward Koob, Dana M. Vantrease, Suresh K. Venkumahanti, Lucian Codrescu, “Hybrid write-through/write-back cache policy managers, and related systems and methods,” Granted 3/16.

Nathan Binkert, Al Davis, Rob Schreiber, Dana Vantrease, “Optical-based barrier synchronization methods and system,” Granted 5/17.

Teaching Experience

Machine Learning lecture series, Amazon Web Services, 2019

Mathematics Volunteer Tutor, Madison Public Schools, 2004–2009

Teaching Assistant, Advanced Computer Architecture I, University of Wisconsin - Madison, 2003

Teaching Assistant, Computer Vision, University of Wisconsin - Madison, Fall 2002

Teaching Assistant, Freshman Engineering Honors Program, Ohio State University, 2000 – 2001

Teaching Assistant, Engineering Honors Summer Institute, Ohio State University, 1999, 2002

Board Memberships

Ohio State University Industrial Advisory Board Member, 2016-present

Professional Service

ISCA-46 External Review Committee, 2020.

MICRO-40 Best Paper Review Committee, 2019.

HPCA Program Committee - Industrial Session, 2018.

Reviewer: IEEE Computer Architecture Letters, HPCA-15, MICRO-40, MICRO-41, ISCA-35, and ISCA-36.

University Service

Invited speaker for “Evening Chats,” a series for female interns, Amazon Web Services, 2020.

Women in Industry round-table organizer for ACM-Women group, Ohio State University, 2018.

Mentor at OH/IO Hackathon, Ohio State University, 2017.

Organizer of Computer Architecture Reading Group, 2009.

Founder of the UW-CS Graduates Anonymous group, a graduate student mentoring group, Fall 2006–2009.

Presenter and organizer of “What’s Hot in CS” luncheon, 2009.

Co-organizer of UW-CS panels on “How to Interview for Academic and Research Lab Positions” and “Preparing for The Preliminary Examination,” 2008.

New Graduate Student Orientation Chair for the Computer Sciences department of UW-Madison 2003.

Community Service

Organized L.E.D. Wearables workshops for GirlStart, 2015.

Honors and Awards

19th top patent filer in company, Amazon, 2019

ImpaQt innovation competition finalist, Qualcomm, 2015

Best Student Presentation, IEEE MICRO-42, 2009

Wisconsin Entrepreneurial Bootcamp Participant, 2009

National Summer Institute Fellow, University of Denver, 2009

National Science Foundation Graduate Research Fellowship, 2004

Wisconsin Capital Times “Volunteers Get Recognition,” 2003

Advanced Opportunity Fellowship, 2002

Undergraduate University Research Grant, 2001