

AWARDS

- Best Artifact SEAMS 2017
- DOE Early Career Research Program 2015.
- Best Paper Award at the Embedded Operating Systems Workshop 2014
- Work on Self-aware computing named one of ten “World Changing Ideas” by Scientific American (Dec., 2011)
- Implementation of BDTI Wireless Communication Benchmark (OFDM) on Tiler TILEPro64 achieved highest performance on a programmable processor (as of 08/2017)
- Best Paper Award HPEC 2005
- Appointed MIT Lincoln Laboratory Doctoral Scholar (Declined appointment)
- Appointed MIT Lincoln Laboratory Masters Scholar
- Phi Beta Kappa
- Pi Mu Epsilon
- Received B.S. with Highest Honors and Highest Distinction

KEY PUBLICATIONS IN SELF-AWARE COMPUTING

Applying Control Theory to Manage Computer System Dynamics:

- Shu Wang, Chi Li, William Sentosa, Henry Hoffmann, and Shan Lu. Understanding and Auto-Adjusting Performance-Sensitive Configurations. In *Proceedings of the Twenty-third International Conference on Architectural Support for Programming Languages and Operating Systems, ASPLOS (to appear)*, 2018
- Martina Maggio, Alessandro Vittorio Papadopoulos, Antonio Filieri, and Henry Hoffmann. Automated control of multiple software goals using multiple actuators. In *Symposium on the Foundations of Software Engineering FSE*, 2017
- Antonio Filieri, Henry Hoffmann, and Martina Maggio. Automated Design of Self-adaptive Software with Control-theoretical Formal Guarantees. In *36th International Conference on Software Engineering, ICSE*, 2014
- Henry Hoffmann, Stelios Sidiroglou, Michael Carbin, Sasa Misailovic, Anant Agarwal, and Martin C. Rinard. Dynamic Knobs for Responsive Power-aware Computing. In *Proceedings of the 16th International Conference on Architectural Support for Programming Languages and Operating Systems, ASPLOS*, 2011

Applying Machine Learning to Manage Computer System Complexity:

- Zhaoxia Deng, Lunkai Zhang, Nikita Mishra, Henry Hoffmann, and Fred Chong. Memory cocktail therapy: A general learning-based framework to optimize dynamic tradeoffs in nvms. In *50th Annual IEEE/ACM International Symposium on Microarchitecture MICRO*, 2017

- Nikita Mishra, John D. Lafferty, and Henry Hoffmann. ESP: A machine learning approach to predicting application interference. In *14th International Conference on Autonomic Computing, ICAC*, 2017
- Huazhe Zhang and Henry Hoffmann. Maximizing Performance Under a Power Cap: A Comparison of Hardware, Software, and Hybrid Techniques. In *Proceedings of the Twenty-first International Conference on Architectural Support for Programming Languages and Operating Systems, ASPLOS*, 2016
- Nikita Mishra, Huazhe Zhang, John D. Lafferty, and Henry Hoffmann. A Probabilistic Graphical Model-based Approach for Minimizing Energy Under Performance Constraints. In *Proceedings of the Twentieth International Conference on Architectural Support for Programming Languages and Operating Systems, ASPLOS*, 2015
- *Combining Control and Learning:*
 - Nikita Mishra, Connor Imes, John D. Lafferty, and Henry Hoffmann. CALOREE: Learning Control for Predictable Latency and Low Energy. In *Proceedings of the Twenty-third International Conference on Architectural Support for Programming Languages and Operating Systems, ASPLOS (to appear)*, 2018
 - Muhammed Husni Santriaji and Henry Hoffmann. GRAPE: Minimizing Energy for Interactive GPU Applications. In *49th Annual IEEE/ACM International Symposium on Microarchitecture MICRO*, 2016
 - Yanqi Zhou, Henry Hoffmann, and David Wentzlaff. CASH: Supporting IaaS Customers with a Sub-core Configurable Architecture. In *Proceedings of the Twenty-first International Symposium on Computer Architecture, ISCA*, 2016
 - Henry Hoffmann. JouleGuard: Energy Guarantees for Approximate Applications. In *Proceedings of the 25th Symposium on Operating Systems Principles, SOSP*, 2015

GRANTS

Total Funding for which I am PI or co-PI: **\$4,966,417** (counts only funds for University of Chicago, not partner institutions).

- *Controlling Tunable Parameters in the HMP Scheduler*
 - Huawei
 - Investigators: Henry Hoffmann (University of Chicago)
 - Period: 2017
 - Amount: \$50,000 (for University of Chicago)
- *Proteus: Controlling Resource-Adaptive Embedded Software*
 - DARPA

- Investigators: Krishna Palem (Rice), Henry Hoffmann (University of Chicago), and others
 - Period: 2015-2018
 - Amount: \$1,645,000 (for University of Chicago)
- *EAGER: HAWKEYE: A Cross-Layer Resilient Architecture to Tradeoff Program Accuracy and Resilience Overheads*
 - NSF
 - Investigators: Omer Khan (UConn) and Henry Hoffmann (University of Chicago)
 - Period: 2015-2016
 - Amount: \$150,000 (for University of Chicago)
- *CNS-1526304, CSR: Small: BreezeFS: File System Transformation for Cloud and Multistore Era*
 - National Science Foundation
 - Investigators: Haryadi Gunawi and Henry Hoffmann (University of Chicago)
 - Period: 2015-2017
 - Amount: \$498,013
- *DOE-0000217037, Early Career Research Program: CALORIE: A Constraint Language and Optimizing Runtime for Exascale Power Management*
 - Department of Energy
 - Investigator: Henry Hoffmann (University of Chicago)
 - Period: 2015-2019
 - Amount: \$758,230
- *DOE-1439156, Argo: An Exascale Operating System and Runtime*
 - Department of Energy
 - Investigators: Pete Beckman (Argonne National Laboratory), Henry Hoffmann (University of Chicago), and others
 - Period: 2013-2016
 - Amount: \$368,518 (for University of Chicago)
- *CCF-1439156, XPS: FULL: CCA: Collaborative Research: CASH: Cost-aware Adaptation of Software and Hardware*
 - National Science Foundation
 - Investigators: David Wentzlaff (Princeton), Henry Hoffmann (University of Chicago)
 - Period: 2014-2017
 - Amount: \$300,000 (for University of Chicago)

- *CNS-1405959, II-New: RIVER: A Research Infrastructure to explore Volatility, Energy-efficiency, and Resilience*
 - National Science Foundation
 - Investigators: Andrew A. Chien, Haryadi Gunawi, Henry Hoffmann, and others
 - Period: 2014-2016
 - Amount: \$997,432
- *DARPA-5710003441, Carbon: Embedded Organic Computing*
 - Defense Advanced Research Projects Administration
 - Investigators: Srinivas Devadas (MIT), Henry Hoffmann, and others
 - Period: 2012-2015
 - Amount: \$199,224 (for University of Chicago)

JOURNAL
PUBLICATIONS

2017

- Antonio Filieri, Martina Maggio, Konstantinos Angelopoulos, Nicolás D’Ippolito, Ilias Gerostathopoulos, Andreas Berndt Hempel, Henry Hoffmann, Pooyan Jamshidi, Evangelia Kalyvianaki, Cristian Klein, Filip Krikava, Sasa Misailovic, Alessandro Vittorio Papadopoulos, Suprio Ray, Amir Molzam Sharifloo, Stepan Shevtsov, Mateusz Ujma, and Thomas Vogel. Control strategies for self-adaptive software systems. **ACM Transactions on Autonomous and Adaptive Systems**, 11(4):24:1–24:31, 2017
- Waqar Hussain, Henry Hoffmann, Tapani Ahonen, and Jari Nurmi. Power mitigation by performance equalization in a heterogeneous reconfigurable multicore architecture. **Signal Processing Systems**, 87(3), 2017

2016

- Can Hankendi, Henry Hoffmann, and Ayse Coskun. Adapt&cap: Coordinating system- and application-level adaptation for power-constrained systems. **IEEE Design & Test**, 33(1):68–76, 2016
- Waqar Hussain, Roberto Airoidi, Henry Hoffmann, Tapani Ahonen, and Jari Nurmi. HARP2: an x-scale reconfigurable accelerator-rich platform for massively-parallel signal processing algorithms. **Signal Processing Systems**, 85(3), 2016

2015

- Qinfeng Shi, Henry Hoffmann, and Omar Khan. A hw-sw multicore architecture to tradeoff program accuracy and resilience overheads. **Computer Architecture Letters**, 14(2):85–89, 2015

2014

- Connor Imes and Henry Hoffmann. Minimizing energy under performance constraints on embedded platforms: resource allocation heuristics for homogeneous and single-isa heterogeneous multi-cores. **SIGBED Review**, 11(4), 2014

- 2013
- Martina Maggio, Henry Hoffmann, Marco D. Santambrogio, Anant Agarwal, and Alberto Leva. Power optimization in embedded systems via feedback control of resource allocation. **IEEE Trans. Contr. Sys. Techn.**, 21(1), 2013
- 2012
- Henry Hoffmann, Anant Agarwal, and Srinivas Devadas. Selecting Spatiotemporal Patterns for Development of Parallel Applications. **IEEE Trans. Parallel Distrib. Syst.**, 23(10):1970–1982, 2012
 - Martina Maggio, Henry Hoffmann, Alessandro V. Papadopoulos, Jacopo Panerati, Marco D. Santambrogio, Anant Agarwal, and Alberto Leva. Comparison of decision-making strategies for self-optimization in autonomic computing systems. **ACM Trans. Auton. Adapt. Syst.**, 7(4), December 2012
- 2007
- David Wentzlaff, Patrick Griffin, Henry Hoffmann, Liewei Bao, Bruce Edwards, Carl Ramey, Matthew Mattina, Chyi-Chang Miao, John F. Brown III, and Anant Agarwal. On-chip interconnection architecture of the tile processor. **IEEE Micro**, 27(5), 2007
- 2005
- James Lebak, Jeremy Kepner, Henry Hoffmann, and Edward Rutledge. Parallel vsipl++: An open standard software library for high-performance parallel signal processing. **Proceedings of the IEEE**, 93(2):313–330, 2005
- 2004
- Volker Strumpfen, Henry Hoffmann, and Anant Agarwal. Stream algorithms and architecture. **J. Instruction-Level Parallelism**, 6, 2004
- 2002
- Michael Bedford Taylor, Jason Sungtae Kim, Jason E. Miller, David Wentzlaff, Fae Ghodrati, Ben Greenwald, Henry Hoffmann, Paul Johnson, Jae W. Lee, Walter Lee, Albert Ma, Arvind Saraf, Mark Seneski, Nathan Shnidman, Volker Strumpfen, Matthew Frank, Saman P. Amarasinghe, and Anant Agarwal. The raw microprocessor: A computational fabric for software circuits and general-purpose programs. **IEEE Micro**, 22(2), 2002
 - William Thies, Michal Karczmarek, Michael I. Gordon, David Maze, Jeremy Wong, Henry Hoffmann, Matthew Brown, and Saman P. Amarasinghe. A common machine language for grid-based architectures. **SIGARCH Computer Architecture News**, 30(3):13–14, 2002

CONFERENCE
& SELECTED
WORKSHOP
PUBLICATIONS

- 2018
- Nikita Mishra, Connor Imes, John D. Lafferty, and Henry Hoffmann. CALOREE: Learning Control for Predictable Latency and Low Energy.

In *Proceedings of the Twenty-third International Conference on Architectural Support for Programming Languages and Operating Systems*, **ASPLOS** (to appear), 2018

- Bernard Dickens III, Ariel J. Feldman, Haryadi Gunawi, and Henry Hoffmann. StrongBox: Confidentiality, Integrity, and Performance using Stream Ciphers for Full Drive Encryption. In *Proceedings of the Twenty-third International Conference on Architectural Support for Programming Languages and Operating Systems*, **ASPLOS** (to appear), 2018
- Shu Wang, Chi Li, William Sentosa, Henry Hoffmann, and Shan Lu. Understanding and Auto-Adjusting Performance-Sensitive Configurations. In *Proceedings of the Twenty-third International Conference on Architectural Support for Programming Languages and Operating Systems*, **ASPLOS** (to appear), 2018

2017

- Zhaoxia Deng, Lunkai Zhang, Nikita Mishra, Henry Hoffmann, and Fred Chong. Memory cocktail therapy: A general learning-based framework to optimize dynamic tradeoffs in nvms. In *50th Annual IEEE/ACM International Symposium on Microarchitecture MICRO*, 2017
- Martina Maggio, Alessandro Vittorio Papadopoulos, Antonio Filieri, and Henry Hoffmann. Automated control of multiple software goals using multiple actuators. In *Symposium on the Foundations of Software Engineering FSE*, 2017
- Nikita Mishra, John D. Lafferty, and Henry Hoffmann. ESP: A machine learning approach to predicting application interference. In *14th International Conference on Autonomic Computing, ICAC*, 2017
- Martina Maggio, Alessandro Vittorio Papadopoulos, Antonio Filieri, and Henry Hoffmann. Self-adaptive video encoder: Comparison of multiple adaptation strategies made simple. In *12th IEEE/ACM International Symposium on Software Engineering for Adaptive and Self-Managing Systems, SEAMS*, 2017
- Ivana Marincic, Venkatram Vishwanath, and Henry Hoffmann. Polimer: An energy monitoring and power limiting interface for HPC applications. In *Proceedings of the 5th International Workshop on Energy Efficient Supercomputing, E2SC@SC*, 2017

2016

- Huazhe Zhang and Henry Hoffmann. Maximizing Performance Under a Power Cap: A Comparison of Hardware, Software, and Hybrid Techniques. In *Proceedings of the Twenty-first International Conference on Architectural Support for Programming Languages and Operating Systems*, **ASPLOS**, 2016
- Yanqi Zhou, Henry Hoffmann, and David Wentzlaff. CASH: Supporting IaaS Customers with a Sub-core Configurable Architecture. In *Proceedings of the Twenty-first International Symposium on Computer Architecture, ISCA*, 2016

- Anne Farrell and Henry Hoffmann. Meantime: Achieving both minimal energy and timeliness with approximate computing. In *USENIX Annual Technical Conference*, **USENIX ATC**, 2016
 - Muhammed Husni Santriaji and Henry Hoffmann. GRAPE: Minimizing Energy for Interactive GPU Applications. In *49th Annual IEEE/ACM International Symposium on Microarchitecture* **MICRO**, 2016
 - Connor Imes, Lars Bergstrom, and Henry Hoffmann. A portable interface for runtime energy monitoring. In *Symposium on the Foundations of Software Engineering* **FSE**, 2016
 - Mischa Möstl, Johannes Schlatow, Rolf Ernst, Henry Hoffmann, Arif Merchant, and Alexander Shraer. Self-aware systems for the internet-of-things. In *Proceedings of the Eleventh IEEE/ACM/IFIP International Conference on Hardware/Software Codesign and System Synthesis*, **CODES**, 2016
 - Connor Imes and Henry Hoffmann. Bard: A unified framework for managing soft timing and power constraints. In *International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation*, **SAMOS**, 2016
 - Connor Imes, David H. K. Kim, Martina Maggio, and Henry Hoffmann. Portable multicore resource management for applications with performance constraints. In *10th IEEE International Symposium on Embedded Multicore/Many-core Systems-on-Chip*, **MCSOC**, 2016
 - Saeid Barati and Hank Hoffmann. Providing Fairness in Heterogeneous Multicores with a Predictive, Adaptive Scheduler. In *International Parallel and Distributed Processing Symposium Workshops*, **IPDPS Workshops**, 2016
 - Daniel A. Ellsworth, Tapasya Patki, Swann Perarnau, Sangmin Seo, Abdelhalim Amer, Judicael A. Zounmevo, Rinku Gupta, Kazutomo Yoshii, Henry Hoffmann, Allen D. Malony, Martin Schulz, and Peter H. Beckman. Systemwide Power Management with Argo. In *International Parallel and Distributed Processing Symposium Workshops* **IPDPS Workshops**, 2016
- 2015
- Henry Hoffmann. JouleGuard: Energy Guarantees for Approximate Applications. In *Proceedings of the 25th Symposium on Operating Systems Principles*, **SOSP**, 2015
 - Nikita Mishra, Huazhe Zhang, John D. Lafferty, and Henry Hoffmann. A Probabilistic Graphical Model-based Approach for Minimizing Energy Under Performance Constraints. In *Proceedings of the Twentieth International Conference on Architectural Support for Programming Languages and Operating Systems*, **ASPLOS**, 2015
 - Connor Imes, David H. K. Kim, Martina Maggio, and Henry Hoffmann. POET: A Portable Approach to Minimizing Energy Under Soft Real-time Constraints. In *21st IEEE Real-Time and Embedded Technology and Applications Symposium*, **RTAS**, 2015

- Antonio Filieri, Henry Hoffmann, and Martina Maggio. Automated multi-objective control for self-adaptive software design. In *Proceedings of the 2015 10th Joint Meeting on Foundations of Software Engineering, ESEC/FSE*, 2015
- Antonio Filieri, Martina Maggio, Konstantinos Angelopoulos, Nicolás D’Ippolito, Ilias Gerostathopoulos, Andreas B. Hempel, Henry Hoffmann, Pooyan Jamshidi, Evangelia Kalyvianaki, Cristian Klein, Filip Krikava, Sasa Misailovic, Alessandro Vittorio Papadopoulos, Suprio Ray, Amir Molzam Sharifloo, Stepan Shevtsov, Mateusz Ujma, and Thomas Vogel. Software engineering meets control theory. In *10th IEEE/ACM International Symposium on Software Engineering for Adaptive and Self-Managing Systems, SEAMS*, 2015
- David H. K. Kim, Connor Imes, and Henry Hoffmann. Racing and pacing to idle: Theoretical and empirical analysis of energy optimization heuristics. In *2015 IEEE 3rd International Conference on Cyber-Physical Systems, Networks, and Applications, CPSNA*, 2015
- Gushu Li, Xiaoming Chen, Guangyu Sun, Henry Hoffmann, Yongpan Liu, Yu Wang, and Huazhong Yang. A stt-ram-based low-power hybrid register file for gpgpus. In *Proceedings of the 52nd Annual Design Automation Conference DAC*, 2015
- Swann Perarnau, Rajeev Thakur, Kamil Iskra, Ken Raffanetti, Franck Cappello, Rinku Gupta, Peter H. Beckman, Marc Snir, Henry Hoffmann, Martin Schulz, and Barry Rountree. Distributed monitoring and management of exascale systems in the argo project. In *Distributed Applications and Interoperable Systems - 15th IFIP WG 6.1 International Conference, DAIS*, 2015
- Tung Thanh Hoang, Amirali Shambayati, Henry Hoffmann, and Andrew A. Chien. Does arithmetic logic dominate data movement? a systematic comparison of energy-efficiency for FFT accelerators. In *26th IEEE International Conference on Application-specific Systems, Architectures and Processors, ASAP*, 2015

2014

- Antonio Filieri, Henry Hoffmann, and Martina Maggio. Automated Design of Self-adaptive Software with Control-theoretical Formal Guarantees. In *36th International Conference on Software Engineering, ICSE*, 2014
- Henry Hoffmann. Coadapt: Predictable behavior for accuracy-aware applications running on power-aware systems. In *26th Euromicro Conference on Real-Time Systems, ECRTS*, 2014
- Yildiz Sinangil, Sabrina M Neuman, Mahmut E Sinangil, Nathan Ickes, Glauber Bezerra, Eric Lau, Jason E Miller, Henry C Hoffmann, Srinivas Devadas, and Anantha P Chandraksan. A self-aware processor soc using energy monitors integrated into power converters for self-adaptation. In *VLSI Circuits Digest of Technical Papers, 2014 Symposium on*. IEEE, 2014

- Henry Hoffmann and Martina Maggio. PCP: A generalized approach to optimizing performance under power constraints through resource management. In *11th International Conference on Autonomic Computing, ICAC*, 2014
 - Tung Thanh Hoang, Amirali Shambayati, Calvin Deutschbein, Henry Hoffmann, and Andrew A. Chien. Performance and energy limits of a processor-integrated FFT accelerator. In *IEEE High Performance Extreme Computing Conference, HPEC*, 2014
 - Waqar Hussain, Roberto Airoldi, Henry Hoffmann, Tapani Ahonen, and Jari Nurmi. Design of an accelerator-rich architecture by integrating multiple heterogeneous coarse grain reconfigurable arrays over a network-on-chip. In *IEEE 25th International Conference on Application-Specific Systems, Architectures and Processors, ASAP*, 2014
 - Connor Imes and Henry Hoffmann. Minimizing energy under performance constraints on embedded platforms. In *Proceedings of the Embedded With Linux 2014 Workshop, EWiLi*, 2014
 - Waqar Hussain, Henry Hoffmann, Tapani Ahonen, and Jari Nurmi. Constraint-driven frequency scaling in a coarse grain reconfigurable array. In *2014 International Symposium on System-on-Chip, ISSoC 2014*, 2014
- 2013
- Henry Hoffmann, Martina Maggio, Marco D. Santambrogio, Alberto Leva, and Anant Agarwal. A generalized software framework for accurate and efficient management of performance goals. In *Proceedings of the International Conference on Embedded Software, EMSOFT*, 2013
 - Henry Hoffmann. Racing and pacing to idle: an evaluation of heuristics for energy-aware resource allocation. In *Proceedings of the Workshop on Power-Aware Computing and Systems, HotPower*, 2013
 - Martina Maggio and Henry Hoffmann. ARPE: A tool to build equation models of computing systems. In *8th International Workshop on Feedback Computing*, 2013
- 2012
- Henry Hoffmann, Jim Holt, George Kurian, Eric Lau, Martina Maggio, Jason E. Miller, Sabrina M. Neuman, Mahmut E. Sinangil, Yildiz Sinangil, Anant Agarwal, Anantha P. Chandrakasan, and Srinivas Devasadas. Self-aware Computing in the Angstrom Processor. In *The 49th Annual Design Automation Conference 2012, DAC*, 2012
 - Filippo Sironi, Davide B. Bartolini, Simone Campanoni, Fabio Cancare, Henry Hoffmann, Donatella Sciuto, and Marco D. Santambrogio. Metronome: operating system level performance management via self-adaptive computing. In *The 49th Annual Design Automation Conference 2012, DAC*, 2012
- 2011
- Henry Hoffmann, Stelios Sidiroglou, Michael Carbin, Sasa Misailovic, Anant Agarwal, and Martin C. Rinard. Dynamic Knobs for Respon-

sive Power-aware Computing. In *Proceedings of the 16th International Conference on Architectural Support for Programming Languages and Operating Systems, ASPLOS*, 2011

- Stelios Sidiroglou-Douskos, Sasa Misailovic, Henry Hoffmann, and Martin C. Rinard. Managing performance vs. accuracy trade-offs with loop perforation. In *SIGSOFT/FSE'11 19th ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE-19) and ESEC'11: 13rd European Software Engineering Conference (ESEC-13)*, Szeged, Hungary, September 5-9, 2011, 2011
 - Omer Khan, Henry Hoffmann, Mieszko Lis, Farrukh Hijaz, Anant Agarwal, and Srinivas Devadas. ARcC: A case for an architecturally redundant cache-coherence architecture for large multicores. In *Computer Design, International Conference on ICCD*, 2011
 - Martina Maggio, Henry Hoffmann, Marco D. Santambrogio, Anant Agarwal, and Alberto Leva. Decision making in autonomic computing systems: comparison of approaches and techniques. In *Proceedings of the 8th ACM international conference on Autonomic computing ICAC*, 2011
 - Filippo Sironi, Andrea Cuoccio, Henry Hoffmann, Martina Maggio, and Marco D. Santambrogio. Evolvable systems on reconfigurable architecture via self-aware adaptive applications. In *2011 NASA/ESA Conference on Adaptive Hardware and Systems, AHS*, 2011
- 2010
- Sasa Misailovic, Stelios Sidiroglou, Henry Hoffmann, and Martin C. Rinard. Quality of service profiling. In *Proceedings of the 32nd ACM/IEEE International Conference on Software Engineering, ICSE*, 2010
 - Martin C. Rinard, Henry Hoffmann, Sasa Misailovic, and Stelios Sidiroglou. Patterns and statistical analysis for understanding reduced resource computing. In *Proceedings of the 25th Annual ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications, OOPSLA*, 2010
 - Henry Hoffmann, Jonathan Eastep, Marco D. Santambrogio, Jason E. Miller, and Anant Agarwal. Application heartbeats for software performance and health. In *Proceedings of the 15th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, PPOPP*, 2010
 - Martina Maggio, Henry Hoffmann, Marco D. Santambrogio, Anant Agarwal, and Alberto Leva. Controlling software applications via resource allocation within the heartbeats framework. In *Proceedings of the 49th IEEE Conference on Decision and Control, CDC*, 2010
 - Henry Hoffmann, David Wentzlaff, and Anant Agarwal. Remote store programming. In *High Performance Embedded Architectures and Compilers, 5th International Conference, HiPEAC*, 2010
 - Henry Hoffmann, Jonathan Eastep, Marco D. Santambrogio, Jason E. Miller, and Anant Agarwal. Application heartbeats: a generic interface

- for specifying program performance and goals in autonomous computing environments. In *Proceedings of the 7th International Conference on Autonomic Computing*, **ICAC**, 2010
- Filippo Sironi, Marco Triverio, Henry Hoffmann, Martina Maggio, and Marco D. Santambrogio. Self-aware adaptation in fpga-based systems. In *International Conference on Field Programmable Logic and Applications*, **FPL**, 2010
 - Filippo Sironi, Andrea Cuoccio, Henry Hoffmann, Martina Maggio, and Marco D. Santambrogio. Evolvable systems on reconfigurable architecture via self-aware adaptive applications. In *2011 NASA/ESA Conference on Adaptive Hardware and Systems*, **AHS**, 2011
 - James Psota, Jason E. Miller, George Kurian, Henry Hoffmann, Nathan Beckmann, Jonathan Eastep, and Anant Agarwal. ATAC: improving performance and programmability with on-chip optical networks. In *International Symposium on Circuits and Systems* **ISCAS**, 2010
 - Henry Hoffmann, Srinivas Devadas, and Anant Agarwal. A pattern for efficient parallel computation on multicore processors with scalar operand networks. In *Proceedings of the 2010 Workshop on Parallel Programming Patterns* **ParaPLoP**, 2010
- 2006
- M. Drake, Henry Hoffmann, Rodric M. Rabbah, and Saman P. Amarasinghe. MPEG-2 decoding in a stream programming language. In *20th International Parallel and Distributed Processing Symposium* **IPDPS**, 2006
- 2005
- Nadya Travinin, Henry Hoffmann, Robert Bond, Hector Chan, Jeremy Kepner, and Edmund Wong. Automatic parallelization with pmapper. In *2005 IEEE International Conference on Cluster Computing* **CLUSTER**, 2005
- 2004
- Michael Bedford Taylor, Walter Lee, Jason E. Miller, David Wentzlaff, Ian Bratt, Ben Greenwald, Henry Hoffmann, Paul Johnson, Jason Sungtae Kim, James Psota, Arvind Saraf, Nathan Shnidman, Volker Strumpfen, Matthew Frank, Saman P. Amarasinghe, and Anant Agarwal. Evaluation of the raw microprocessor: An exposed-wire-delay architecture for ILP and streams. In *31st International Symposium on Computer Architecture* **ISCA**, 2004
- 2003
- Michael B. Taylor, Jason Kim, Jason Miller, David Wentzlaff, Fae Ghodrati, Ben Greenwald, Henry Hoffmann, Paul Johnson, Walter Lee, Arvind Saraf, Nathan Shnidman, Volker Strumpfen, Saman Amarasinghe, and Anant Agarwal. A 16-issue Multiple-Program-Counter Microprocessor with Point-to-Point Scalar Operand Network. In *Proceedings of the IEEE International Solid-State Circuits Conference* **ISSCC**, February 2003

- 2002
- Michael I. Gordon, William Thies, Michal Karczmarek, Jasper Lin, Ali S. Meli, Andrew A. Lamb, Chris Leger, Jeremy Wong, Henry Hoffmann, David Maze, and Saman P. Amarasinghe. A stream compiler for communication-exposed architectures. In *Proceedings of the 10th International Conference on Architectural Support for Programming Languages and Operating Systems ASPLOS*, 2002
- 2001
- James M. Lebak, Jim Daly, Hank Hoffmann, Jeremy Kepner, Jan Matlis, Patrick Richardson, Edward Rutledge, and Glenn Schrader. Software fault recovery for real-time signal processing on massively parallel computers. In **PPSC**, 2001
- INVITED TALKS
- Henry Hoffmann. Invited Talk: Tackling Complexity and Dynamics with Self-aware Computing Systems In *12th Workshop on Feedback Computing* at ICAC 2017
 - Henry Hoffmann. Keynote Talk: What is the Big Deal About Approximate Computing? In *the First Workshop on Emerging Parallel and Distributed Runtime Systems and Middleware* at IPDPS 2016.
 - Henry Hoffmann. Keynote Talk: The Self-aware Computing Model and Challenges for Cyber Physical Systems In *The First Workshop on Self-aware Cyber Physical Systems* at Cyber Physical Systems Week 2016.
 - Henry Hoffmann. A Case for Coordinating Accuracy-aware Applications and Power-aware Systems. In *Dagstuhl Seminar on Model-driven Approaches for Self-aware Computing* 2014.
 - Henry Hoffmann. Untapped Potential for Homogeneous Multicores. In *ISSoC* 2014.
 - Henry Hoffmann. Coordinating Accuracy-aware applications and power-aware systems. In *G/I Dagstuhl Seminar on Control Theory Meets Software Engineering*.
 - Henry Hoffmann. SEEC: A Self-aware Framework for Managing Goals and Constraints in Modern Computing Systems In *MIT Industrial Affiliates Program*, May 2012.
 - Henry Hoffmann. SEEC: A Self-aware Computational Model. In *High Performance Embedded Computing Workshop*, September 2011.
 - Henry Hoffmann. Angstrom's Self-Aware Execution Model. In *Second ParalleX Execution Model Workshop (PEMWS-2)*, April 2011.
 - Henry Hoffmann. Reducing Energy Consumption with Code Perforation. In *2nd Annual Conference on Computational Sustainability*, June 2010.
 - Yale Patt, Roger Espasa, Henry Hoffmann, Walid Najjar, Paolo Faraboshi (moderator). Panel Discussion: Heterogeneous vs. Homogeneous Computing. In *High Performance Embedded Architectures and Compilers*, January 2010.

BOOK
CHAPTERS

- Waqar Hussain, Henry Hoffmann, Tapani Ahonen, and Jari Nurmi. *Design Transformation from a Single-Core to a Multi-Core Architecture Targeting Massively Parallel Signal Processing Algorithms*, pages 7–28. Springer International Publishing, 2017
- Jeffrey O Kephart, Martina Maggio, Ada Diaconescu, Holger Giese, Henry Hoffmann, Samuel Kounev, Anne Koziolk, Peter Lewis, Anders Robertsson, and Simon Spinner. Reference scenarios for self-aware computing. In *Self-Aware Computing Systems*, pages 87–106. Springer International Publishing, 2017
- Michael B. Taylor, Walter Lee, Jason Miller, David Wentzlaff, Ian Bratt, Ben Greenwald, Henry Hoffmann, Paul Johnson, Jason Kim, James Psota, Arvind Saraf, Nathan Shnidman, Volker Strumpfen, Matt Frank, Roderic Rabbah, Saman Amarasinghe, and Anant Agarwal. *Stream Multicore Processors*, chapter 14, pages 309–338. Springer, Dordrecht, The Netherlands, 2007.
- Michael B. Taylor, Walter Lee, Jason E. Miller, David Wentzlaff, Ian Bratt, Ben Greenwald, Henry Hoffmann, Paul Johnson, Jason Kim, James Psota, Arvind Saraf, Nathan Shnidman, Volker Strumpfen, Matt Frank, Saman Amarasinghe, and Anant Agarwal. *Tiled Multicore Processors*, chapter 1, pages 1–34. Springer, New York, NY, USA, 2009.

PATENTS

- Nadya Travinin Bliss and Henry Hoffmann. Method and apparatus performing automatic mapping for a multi-processor system. Patent, July 2011. US 7983890 B2.

DEGREES
SUPERVISED

Nikita Mishra (co-supervised with John Lafferty)

- Degree received: MS 2015, PhD 2017
- Current Position: Solvvy

Anne Farrell

- Degree received: MS 2016
- Current Position: PhD student, University of Chicago

Connor Imes

- Degree received: MS 2015
- Current Position: PhD student, University of Chicago

Huazhe (Harper) Zhang

- Degree received: MS 2015
- Current Position: PhD student, University of Chicago

Zhixuan Zhou

- Degree received: MS 2015

- Current Position: PhD student, University of Chicago

Tristan Rasmussen

- Degree received: BS/MS 2015
- Current Position: Google

Saeid Barati

- Degree received: MS 2015
- Current Position: PhD student, University of Chicago

Lee Ehudin

- Degree received: BS/MS 2017
- Current Position: Google

PROFESSIONAL
SERVICE

- Program Chair for WAX 2018
- Program Committee for ASPLOS 2018
- Program Committee for SOSP 2017.
- External Review Committee for MICRO 2017.
- External Review Committee for ASPLOS 2017.
- External Review Committee for PLDI 2016.
- Vice Chair for Architecture IPDPS 2016.
- Program Committee ICCD 2015.
- Publications Chair HPCA 2015.
- Program Committee System Software Track Supercomputing 2014.
- Program Committee System Software Track Supercomputing 2013.
- Co-chair of 4th International Workshop on Computing in Heterogeneous, Autonomous 'N' Goal-oriented Environments (co-located with DAC 2014)
- Co-chair of 3rd International Workshop on Computing in Heterogeneous, Autonomous 'N' Goal-oriented Environments (co-located with DAC 2013)
- Co-chair of 2nd International Workshop on Computing in Heterogeneous, Autonomous 'N' Goal-oriented Environments (co-located with DAC 2012)
- Program Committee for 9th International Conference on Embedded and Ubiquitous Computing 2011
- Reviewer for 2nd Annual Symposium on Cloud Computing 2011
- Co-chair of 1st International Workshop on Computing in Heterogeneous, Autonomous 'N' Goal-oriented Environments (co-located with ASPLOS 2011)
- Program Committee for 2nd Annual Workshop on Computer Architecture and Operating Systems co-design 2010
- Reviewer for International Symposium on Computer Architecture 2010
- Reviewer for International System-on-Chip Conference 2005

- DEPARTMENTAL SERVICE
- Graduate Student Awards Committee 2017–present
 - Graduate Student Curriculum Committee 2017–present
 - Systems Lunch Seminar Organizer (Summer 2016, Winter 2015, Winter 2014, Winter 2013)
 - Distinguished Lecturer Series Organizer 2016
 - Committee to Address Undergraduate Enrollment Expansion (and report to the Dean) 2016
 - PhD Admissions Committee (Systems) 2013–2016
 - Junior Faculty Hiring Committee (Systems) 2013–2016

COURSES TAUGHT

| University of Chicago | | |
|------------------------------|----------------------------------|--------------------|
| CMSC 32200 | Computer Architecture | Fall 2017 |
| CMSC 15400 | Introduction to Computer Systems | Spring 2017 |
| CMSC 23010 | Parallel Computing | Winter 2017 |
| CMSC 32200 | Computer Architecture | Fall 2016 |
| CMSC 15400 | Introduction to Computer Systems | Spring 2016 |
| CMSC 23010 | Parallel Computing | Winter 2016 |
| CMSC 33001 | Power and Energy-aware Computing | Fall 2015 |
| CMSC 15400 | Introduction to Computer Systems | Spring 2015 |
| CMSC 33001 | Power and Energy-aware Computing | Winter 2015 |
| CMSC 32200 | Computer Architecture | Fall 2014 |
| CMSC 15400 | Introduction to Computer Systems | Spring 2014 |
| CMSC 23010 | Parallel Computing | Winter 2014 |
| CMSC 32200 | Computer Architecture | Fall 2013 |
| CMSC 23010 | Parallel Computing | Spring 2013 |
| CMSC 33001 | Power and Energy-aware Computing | Winter 2013 |

- PROFESSIONAL EXPERIENCE (OUTSIDE ACADEMIA)
- Self-employed, Cambridge, MA
- Consultant on Multicore Application Development* **February 2008 to 2011**
- Implemented BDTI OFDM Receiver Benchmark using 64 cores on Tiler TILE64 processor architecture
 - Optimized single core performance of BDTI OFDM Receiver Benchmark on TILE64
 - Optimized communication in parallel implementation of BDTI OFDM Receiver Benchmark on TILE64 and TILEPro64
 - Designed parallel FFT for TILEPro64 architecture

Tilera Corporation, Westborough, MA

- Design Engineer* **December 2005 to February 2008**
- Designed programming abstraction to increase productivity of engineers developing parallel DSP code

- Contributed to design of architecture and programming model for a family of new parallel, multicore architectures
- Engaged with customers to understand their needs and how Tileria could better serve them
- Addressed technical and engineering questions on business development and sales calls
- Presented technical information on architecture, software, and applications to numerous customers
- Educated several customers on programming Tileria's hardware and parallel programming in general
- Ported many customer applications to Tileria hardware, including H.264 encoders, MPEG-2 encoders, 20+ DSP benchmarks, printing/imaging benchmarks, and wireless processing benchmarks
- Implemented scalable, real-time HD H.264 encoder executed on over 60 processors
- Implemented scalable, faster than real-time MPEG-2 encoder executed on over 60 processors

MIT Lincoln Laboratory, Lexington, MA

Associate Technical Staff

June 2003 to September 2004

Assistant Technical Staff

July 1999 to June 2003

- Designed and implemented algorithms, software, and run-time system for automatic parallelization of MATLAB programs
- Designed and implemented a C++ library for high performance parallel signal processing and scientific computing
- Designed and implemented algorithms, software, and run-time system for automatic parallelization of C++ digital signal processing programs
- Designed and implemented novel parallel algorithms for digital signal processing and linear algebra
- Evaluated emerging microarchitectures for use as embedded digital signal processing platforms
- Demonstrated to U.S. Navy viability of software and COTS solutions for real-time radar signal processing
- Implemented large-scale, parallel signal processing software for radar and sonar systems
- Mentored junior employees
- Prepared numerous technical presentations and documents

SAS Institute, Inc., Cary, NC

Summer Student

May 1998 to August 1998

- Implemented C++ software to enable distribution of SAS databases

- Wrote test programs for existing SAS functionality
- Implemented an automated overnight regression test suite