KYLE C. HALE

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PERSONAL INFORMATION

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RESEARCH INTERESTS

Unconventional and experimental computer systems, especially relating to operating systems, parallel computing, high-performance computing, resource virtualization and virtual machine monitors, computer architecture, and network and software security.

EDUCATION

August 2016 — Northwestern University

Ph.D. in Computer Science

Department of Electrical Engineering and Computer Science
Thesis: *Hybrid Runtime Systems*
Advisor: Prof. Peter A. Dinda

March 2013 — Northwestern University

M.S. in Computer Science

Department of Electrical Engineering and Computer Science

May 2010 — The University of Texas at Austin

B.S. in Computer Science

Department of Computer Science
Honors Thesis: *Segment Gating for Static Energy Reduction with Introspective Networks-on-Chip*
Advisor: Prof. Stephen W. Keckler

Sept. 2007 — Sophia University, Tokyo, Japan

Intensive Japanese Language Program

EMPLOYMENT

2016–Present Assistant Professor, Illinois Institute of Technology, Department of Computer Science
Chicago, IL

Illinois Institute of Technology

Assistant Professor in the Department of Computer Science.

2010–2016 Ph.D. Student, Northwestern University
Department of Electrical Engineering and Computer Science
Evanston, IL

Northwestern University

Conducted research in unconventional and experimental computer systems, with an emphasis on operating systems and high-performance computing.

Summer 2013 Research Intern, VMWare, Inc.
Proactive Distributed Resource Management Team
Palo Alto, CA

VMWare, Inc.

Investigated the ability to leverage application communication patterns in parallel codes to implement proactive resiliency in a virtualized environment (particularly for VMWare vSphere).

Aug-Sep 2012 Technical Computing Intern, Fujitsu Ltd.
Technical Computing Solutions Unit
Chiba, Japan

Fujitsu Ltd.

Tested, packaged, and installed the Fujitsu cross-compiler toolkit for the PRIMEHPC FX10 Supercomputer on access nodes. Developed test-suite of hybrid parallel applications (MPI/OpenMP/FFTW) aimed at customers developing cross-compiled programs for the PRIMEHPC FX10.

Summer 2012 Graduate Technical Research Intern, Sandia Labs
Scalable Systems Software Unit
Albuquerque, NM

Sandia National Laboratories

Ported the Palacios Virtual Machine Monitor to the Cray XK6. Developed a novel, RDMA-based high-performance networking component within the Palacios VMM to mitigate network virtualization overhead in HPC applications.

PUBLICATIONS

Journal Papers

TPDS 09/2022

B. Tauro, C. Liu, and **K.C. Hale**. Modeling Speedup in Multi-OS Environments. *IEEE Transactions on Parallel and Distributed Systems*, Vol. 33, No. 6, September, 2022, pp. 1436-1450.

Refereed Conference and Workshop Papers

EuroSys 2022

N. Wanninger, J. Bowden, and **K.C. Hale**. Isolating Functions at the Hardware Limit with Virtines. *Proceedings of the European Conference on Computer Systems*, to appear.

Middleware 2022 E. Romero-Gainza, C. Stewart, A. Li, **K.C. Hale**, N. Morris. Bolt: Fast Inference for Random Forests. *Proceedings of the 23rd ACM/IFIP International Middleware Conference*, to appear.

ROSS 2021 **K.C. Hale**, S. Campanoni, N. Hardavellas, P. Dinda. The Case for an Interwoven Hardware/Software Stack. *Proceedings of the* 10^{th} *International Workshop on Runtime and Operating Systems for Supercomputers*, November, 2021.

MASCOTS 2021 P. Nookala, P. Dinda, **K.C. Hale**, I. Raicu, and K. Chard. Extremely Fine-grained Parallelism via Scalable Concurrent Queues on Modern Many-core Architectures. *Proceedings of the* 28^{th} *IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems*, November, 2021.

SC 2021 J. Ma, W. Wang, A. Nelson, M. Cuevas, B. Homerding, C. Liu, Z. Huang, S. Campanoni, **K.C. Hale**, and P. Dinda. Paths to OpenMP in the Kernel. *Proceedings of the International Conference for High Performance Computing, Networking, Storage, and Analysis*, November, 2021.

APSys 2021 **K.C. Hale**. Coalescent Computing. *Proceedings of the* 12^{th} *ACM SIGOPS Asia-Pacific Workshop on Systems*, August, 2021.

PDADS 2021 E. Romero-Gainza, C. Stewart, A. Li, **K.C. Hale**, N. Morris. Memory Mapping and Parallelizing Random Forests for Speed and Cache Efficiency. *Proceedings of the* 1^{st} *International Workshop on Parallel and Distributed Algorithms for Decision Sciences (co-located with ICPP '21)*, August, 2021.

DaMoN 2021 Q. Zeng, **K.C. Hale**, and B. Glavic. Playing Fetch with CAT - Composing Cache Partitioning and Prefetching for Task-based Query Processing. *Proceedings of the International Workshop on Data Management on New Hardware*, June, 2021.

PLDI 2021 M. Rainey, R.R. Newton, **K.C. Hale**, N. Hardavellas, S. Campanoni, P. Dinda, and U.A. Acar. Task Parallel Assembly Language for Uncompromising Parallelism. *Proceedings of the* 42^{nd} *ACM SIGPLAN Conference on Programming Language Design and Implementation*, June, 2021.

MASCOTS 2019 B. Tauro, C. Liu, and **K.C. Hale**. Modeling Speedup in Multi-OS Environments. *Proceedings of the* 27^{th} *IEEE International Conference on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems*, October, 2019.

MASCOTS 2019 C. Hetland, G. Tziantzioulis, B. Suchy, **K.C. Hale**, N. Hardavellas, and P. Dinda. Prospects for Functional Address Translation. *Proceedings of the* 27^{th} *IEEE International Conference on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems*, October, 2019.

ROSS 2019 C. Liu and **K.C. Hale**. Towards a Practical Ecosystem for Specialized Operating Systems. *Proceedings of the* 9^{th} *International Workshop on Runtime and Operating Systems for Supercomputers*, June, 2019.

MASCOTS 2018 **K.C. Hale** and P. Dinda. An Evaluation of Asynchronous Software Events on Modern Hardware. *Proceedings of the* 26^{th} *IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems*, September, 2018.

ICAC 2017 **K.C. Hale**, C. Hetland, and P. Dinda. Multiverse: Easy Conversion of Runtime

Systems into OS Kernels via Automatic Hybridization. *Proceedings of the* 14^{th} *International Conference on Autonomic Computing*, July, 2017.

HPDC 2016 **K.C. Hale**, C. Hetland, and P. Dinda. Automatic Hybridization of Runtime Systems. *Proceedings of the* 25^{th} *International ACM Symposium on High-performance Parallel and Distributed Computing*, June, 2016.

VEE 2016 **K.C. Hale** and P. Dinda. Enabling Hybrid Parallel Runtimes Through Kernel and Virtualization Support. *Proceedings of the* 12^{th} *ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments*, April, 2016.

HPDC 2015 **K.C. Hale** and P. Dinda. A Case for Transforming Parallel Runtimes into Operating System Kernels. *Proceedings of the* 24^{th} *International ACM Symposium on High-performance Parallel and Distributed Computing*, June, 2015.

ROSS 2014 M. Swiech, **K.C. Hale**, and P. Dinda. VMM Emulation of Intel Hardware Transactional Memory. *Proceedings of the* 4^{th} *International Workshop on Runtime and Operating Systems for Supercomputers*, June, 2014.

HPDC 2014 L. Xia, **K.C. Hale**, and P. Dinda. ConCORD: Easily Exploiting Memory Content Redundancy Through the Content-aware Service Command. *Proceedings of the* 23^{rd} *ACM Symposium on High-performance Parallel and Distributed Computing*, June, 2014.

ICAC 2014 **K.C. Hale** and P. Dinda. Guarded Modules: Adaptively Extending the VMM's Privilege Into the Guest. *Proceedings of the* 11^{th} *International Conference on Autonomic Computing*, June, 2014.

ICAC 2012 **K.C. Hale**, L. Xia, and P. Dinda. Shifting GEARS to Enable Guest-context Virtual Services. *Proceedings of the* 9^{th} *International Conference on Autonomic Computing*, September, 2012.

NoCArc 2009 **K.C. Hale**, B. Grot, and S. Keckler. Segment Gating for Static Energy Reduction in Networks-On-Chip. *Proceedings of the* 2^{nd} *International Workshop on Network-on-Chip Architectures*, December, 2009.

Non-overlapping Technical Reports and Preprints

arXiv preprint A. Rizvi, **K.C. Hale**. A Look at Communication-Intensive Performance in Julia. Preprint, arXiv:2109.14072, September, 2021.

arXiv preprint N. Wanninger, J. Bowden, and **K.C. Hale**. Virtines: Virtualization at Function Call Granularity. Preprint, arXiv:2104.11324, April, 2021.

October 2019 A. Rizvi and **K.C. Hale**. Evaluating Julia as a Vehicle for High-Performance Parallel Runtime Construction. Technical Report IIT-CS-OS-19-01, Department of Computer Science, IIT, October, 2019.

April 2014 **K.C. Hale** and P. Dinda. Details of the Case for Transforming Parallel Runtimes into Operating System Kernels. Technical Report NU-EECS-15-01, Department of Electrical Engineering and Computer Science, Northwestern University, April, 2014.

November 2011 J. Lange, P. Dinda, **K.C. Hale**, and L. Xia. An Introduction to the Palacios Virtual Machine Monitor—Version 1.3. Technical Report NU-EECS11-10, Department of Electrical Engineering and Computer Science, Northwestern University, November, 2011.

Miscellaneous Posters and Talks

GCASR 2019 P. Nookala, P. Dinda, **K.C. Hale** and I. Raicu. XQueue: Extreme Fine-grained Concurrent Lock-less Queue. Poster at *the* 8^{th} *Annual Greater Chicago Area Systems Research Workshop*, May, 2019.

GCASR 2019 B. Tauro, C. Liu, and **K.C. Hale**. Modeling Speedup in Multi-OS Environments. Poster at *the* 8^{th} *Annual Greater Chicago Area Systems Research Workshop*, May, 2019.

GCASR 2018 A. Rizvi, **K.C. Hale**. Evaluating Julia as a Vehicle for High-performance Parallel Runtime Construction. Poster at *the* 7^{th} *Annual Greater Chicago Area Systems Research Workshop*, April, 2018.

GCASR 2017 P. Nookala, I. Raicu, P. Dinda, and **K.C. Hale**. Performance Analysis of Queue-based Data Structures. Poster at *the* 6^{th} *Annual Greater Chicago Area Systems Research Workshop*, April, 2017.

ROSS 2016 **K.C. Hale** and P. Dinda. Accelerating Asynchronous Events for Hybrid Parallel Runtimes. Invited talk at *the* 6^{th} *International Workshop on Runtime and Operating Systems for Supercomputers*, June, 2016.

GCASR 2016 **K.C. Hale** and P. Dinda. Multiverse: Automatic Hybridization of Parallel Runtime Systems. At *the* 5^{th} *Annual Greater Chicago Area Systems Research Workshop*, April, 2016.

HPDC 2015 **K.C. Hale** and P. Dinda. A Case for Transforming Parallel Runtimes into Operating System Kernels. At *the* 23^{rd} *ACM Symposium on High-performance Parallel and Distributed Computing*, June, 2015.

GCASR 2015 G. Tziantzioulis, **K.C. Hale**, B. Pashaj, N. Hardavellas, and P. Dinda. SeaFire: Specialized Computing on Dark Silicon with Heterogeneous Hardware Multi-Pipelining. At *the* 4^{th} *Annual Greater Chicago Area Systems Research Workshop*, April, 2015.

GCASR 2015 **K.C. Hale** and P. Dinda. A Case for Transforming Parallel Runtimes into Operating System Kernels. At *the* 4^{th} *Annual Greater Chicago Area Systems Research Workshop*, April, 2015.

GCASR 2014 **K.C. Hale** and P. Dinda. Guarded Modules: Adaptively Extending the VMM's Privilege Into the Guest. At *the* 3^{rd} *Annual Greater Chicago Area Systems Research Workshop*, May, 2014.

February 2013 **K.C. Hale.** Dynamic Linking Considered Harmful. Talk given at the NU Computer Systems Reading Group, February, 2013.

ICAC 2012 **K.C. Hale**, L. Xia, and P. Dinda. Shifting GEARS to Enable Guest-context Virtual Services. At *the* 9^{th} *ACM International Conference on Autonomic Computing*, September, 2012.

RESEARCH FUNDING

NSF PPPoSS Planning II

"Collaborative Research: PPoSS: Planning: Towards an Integrated, Full-stack System for Memory-centric Computing," NSF CCF

2029014, $185,473 ($250K collaborative total), January 2021 through December 2021, Co-PI. This project is in collaboration with Rujia Wang (lead PI) and Xian-He Sun at IIT and Peng Jiang at the University of Iowa.

NSF PPoSS Planning

"Collaborative Research: PPoSS: Planning: Unifying Software and Hardware to Achieve Performant and Scalable Zero-cost Parallelism in the Heterogeneous Future," NSF CCF 2028958, $41,627 ($250K collaborative total), October 2020 through September 2021, Principal Investigator. This project is in collaboration with Peter Dinda, Nikos Hardavellas, and Simone Campanoni at Northwestern University and Umut Acar at Carnegie Mellon University.

NSF CSR Medium

"CSR: Medium: Collaborative Research: Interweaving the Parallel Software/Hardware Stack," NSF CNS 1763612, $305,578 ($1.2M collaborative total), September 2018 through August 2021, Principal Investigator. This project is in collaboration with Peter Dinda, Nikos Hardavellas, and Simone Campanoni at Northwestern University.

NSF REU Site

"REU Site: Collaborative Research: BigDataX: From theory to practice in Big Data computing at eXtreme scales," NSF CNS 1757964, $325,000, March 2018 through February 2021, Co-PI. This project is in collaboration with Ioan Raicu at IIT (lead PI) and Kyle Chard at the University of Chicago.

Intel Hardware Grant

"Exploring the Integeration of FPGA-based Reconfigurable Hardware with Specialized OS Environments," Intel Hardware Accelerator Research Program (HARP), May, 2017, prototype hardware access. Principal Investigator (in collaboration with Peter Dinda, Northwestern University).

NSF CRI II-NEW

"CRI: II-NEW: MYSTIC: prograMmable sYstems reSearch Testbed to explore a stack-wIde adaptive system fabriC," NSF CNS 1730689, $1,000,000, July 2017 through June 2020, Co-PI. This project is in collaboration with Ioan Raicu (lead PI) and Xian-He Sun at IIT.

NSF CSR Small

"CSR: Small: Collaborative Research: Flexible Resource Management and Coordination Schemes for Lightweight, Rapidly Deployable OS/Rs," NSF CNS 1718252, $249,771 ($500K collaborative total), August 2017 through July 2020, Principal Investigator. This project is in collaboration with Jack Lange at the University of Pittsburgh.

SOFTWARE

Wasp

Wasp is a microhypervisor designed to boot custom software stacks for lightweight, hardware virtualized functions. Wasp includes a Rust front-end, and extensions to LLVM to allow programmer annotations for virtualized functions.

Diver

Diver is a tool to boot specialized OS kernels such as Unikernels, library OSes, and lightweight kernels on virtual and physical hardware in a similar manner to how containers are launched.

https://github.com/hexsa-lab/diver

Nautilus Aerokernel

Nautilus is an extremely lightweight kernel layer designed as a *privileged* library operating system (called an Aerokernel) that demonstrates the Hybrid Runtime model, wherein the combined parallel runtime and Aerokernel are transformed into a specialized OS kernel. It is a many-core capable OS layer that runs on commodity x64 hardware and the Intel Xeon Phi. I am the primary developer of Nautilus. Descriptions of related systems appear below.

http://nautilus.halek.co
Estimated Lines of Code: 35,000

- **Nemo**: Nemo is an event system in Nautilus for Hybrid Runtimes. Nemo accelerates asynchronous software event delivery by several orders of magnitude by leveraging hardware features typically only available to the OS (but not the runtime) in kernel-mode.

  Estimated Lines of Code: 200

- **Multiverse Runtime**: Multiverse is a runtime system aimed at alleviating the effort required to build and port Hybrid Runtimes. It allows users to explore the benefits of HRTs by automatically running their legacy Linux programs in the Nautilus Aerokernel without any porting effort.

  Estimated Lines of Code: 4,000

Philix

Philix is a tool that I designed for booting 3^{rd} party OS kernels on the Intel Xeon Phi. It allows kernel developers to rapidly prototype new kernel mechanisms on the Phi without implementing Intel's SCIF protocol.

http://philix.halek.co
Estimated Lines of Code: 4,000

Palacios VMM

Palacios is an open-source, embeddable Virtual Machine Monitor actively developed by researchers at several institutions. I have built several systems within the context of Palacios and have made many contributions to the codebase, a subset of which are described below. The code for all of these systems can be found in the development branch of the Palacios repository at the website listed below.

http://v3vee.org/palacios

- **GEARS**: Guest Examination and Revision Services (GEARS) is a set of tools that allows developers to create *guets-context virtual services*, VMM-based

services that extend *into* the guest.

Estimated Lines of Code: 2,500

- **Guarded Modules**: Guarded Modules extend the concept of guest-context virtual services by granting them *privileged* access to hardware and VMM state. Guarded Modules protect this privilege from the rest of the guest by maintaining a software border with compile-time and run-time techniques.

  Estimated Lines of Code: 1,000

- **Virtualized DVFS**: This system allows fine-grained control of the Dynamic Voltage and Frequency Scaling (DVFS) hardware during VM exits, leveraging inferred information about guests to make informed power management decisions.

  Estimated Lines of Code: 500

- **Virtual HPET**: This is a virtual implementation of the High-Precision Event Timer, a fine-grained platform timer present on most contemporary high-performance hardware. I added support for the HPET to allow us to run experimental systems like OSv on Palacios.

  Estimated Lines of Code: 1,000

- **QEMU backend**: QEMU provides a rich diversity of virtual devices. This is one contributor to the simplicity of, e.g. the KVM codebase, as it leverages these device implementations. I wanted to similarly be able to leverage these devices for Palacios. This system implements that functionality with a software bridge between Palacios and QEMU.

  Estimated Lines of Code: 2,000

- **VMM-emulated RTM**: This was the first VMM-emulated implementation of the Restricted Transactional Memory (RTM) component of the Intel Transactional Synchronization Extensions (TSX). Its performance is roughly 60x relative to Intel's emulator.

  Estimated Lines of Code: 1,300

- **Palacios on the Cray XK6**: I ported the Palacios VMM to run on the Cray XK6 series of supercomputer nodes. This comprised several bug fixes and enhancements to the Palacios codebase.

- **Other contributions**: I have also participated in regular development and maintenance of the Palacios codebase. This includes bug fixes, enhancements to the extension architecture, guest configuration and loading, software interrupt and system call interception, and others.

  Estimated Lines of Code: 12,000

SETI Lab

For our Introduction to Computer Systems Course (EECS 213) at Northwestern, we wanted a new lab to give students an earlier, practical introduction to parallel programming. To accomplish this, I designed and

implemented SETI Lab, which is a lab that draws inspiration from SETI@Home. Students compete to parallelize signal analysis code and find alien signals in synthetic radio telescope data.

Estimated Lines of Code: 5,500

AWARDS AND HONORS

2021 · Excellence in Teaching Award · IIT College of Computing

2020 · Teacher of the Year · IIT CS Department

2017 · Best Computer Science PhD Dissertation Award · Northwestern University EECS Department

2016 · Invitee, *the 6th International Workshop on Runtime and Operating Systems for Supercomputers (ROSS)*, June, 2016.

2015 · Best Short Presentation Award · *A Case for Transforming Parallel Runtimes into Operating System Kernels* · HPDC 2015

2005-2010 · Member of Turing Scholars Honors Computer Science Degree Program

2008-2010 · Member of Ronald E. McNair Post-Baccalaureate Achievement Program

2010-2011 · Murphy Graduate Fellowship Recipient

TEACHING AND ADVISING

PhD Students

- **Conghao Liu**, 4th year
- **Brian R. Tauro**, 3rd year
- **MD Ali**, 2nd year
- **Nanda Velugoti**, 1st year

Masters Students Advised

- Ayush Garg, Serverless applications of virtines
- Kirtankumar Shetty, Serverless applications of virtines
- Nithin Rao, Disaggregated memory and remote paging
- Florentin Bekier, System design for computer-vision based parking assistance; now software developer at Infomaniak Network SA

- Nanda Velugoti, Compiler-based blending and debugging; now PhD student in HExSA Lab
- Ganesh Mahesh, Measuring address space dynamics; now software developer at YottaDB
- Piyush Nath, Nautilus InfiniBand driver; now software engineer at EMC Insurance
- Goutham Kannan, Lua in Nautilus kernel; now software engineer at MX Technologies
- Imran Ali-Usmani, Lua in Nautilus kernel; now software engineer at Argonne National Laboratory
- Suraj Chafle, Dune threads in Nautilus; now senior software engineer at CrowdStrike

Undergraduate Students Advised

- Devyn Keeney (REU, Summer '21) Rust port of virtines
- Karl Hallsby (REU, Summer '21) Hardware accelerator design for virtines
- Isabel Raymundo (REU, Summer '21) Coalescent Computing with AR/VR and cloud offloading
- Alexandra Suarez (BigDataX REU, Summer '21) Wifi6 latency measurement
- Akhil Kodomuri (BigDataX REU, Summer '21) Coalescent Computing with LegoOS and GiantVM
- Safa Slote (Fall '20) Floating point in Nautilus Aerokernel
- Trevor Pritchett (Summer '20) Address space dynamics
- Josh Bowden (Spring '20) Language abstractions for virtualized co-routines. Founder and lead software engineer at Domination Finance.
- Nicholas Wanninger (REU, AY '19, AY '20, AY '21) Virtualized functions; now PhD student at Northwestern University.
- Iris Uwizeyimana (Summer '19) AI-accelerated hearing aid architecture; now PhD student at University of Toronto.
- Justin Orr (Summer '19) Multiverse and HVM; now software engineer at Future Velo LLC.
- Andrew Neth (Summer '19) Multiverse and HVM

- Justin Goodman (BigDataX REU, Summer '19) Address space dynamics
- Hussain Khajanchi (BigDataX REU, Summer '19) AI-accelerated hearing aid architecture; now PhD student at Northwestern University
- Gyucheon (Jake) Heo (Summer '19) Investigating new OS abstractions for high-performance I/O
- Samuel Grayson (BigDataX REU, Summer '18) building a customized kernel for high-performance data processing; now PhD student at UIUC
- Jagruti Depan (BigDataX REU, Summer '18) FPGA-based implementation of network science algorithms
- Lucas Myers (Summer '18) development of NES emulator for CS 562 class; now staff software engineer at Applied Research Associates, Inc.
- Josué Rodríguez Nieves (BigDataX REU, Summer '17) programmable on-chip network architectures; now PhD student at Florida International University and NSF GRFP fellow.
- Zachary McKee (Summer '17) development of CFG language generation system

Courses Created

- CS 562 - Virtual Machines; first taught F17
- CS 595-03 - OS and Runtime System Design for Supercomputing; first taught F16
- CSP 544 - System and Network Security; first taught S20
- CS 450 - Operating Systems (course redesign); first taught S19
- CS 595-01 - Advanced Topics in Serverless and Edge Computing; first taught F21

PhD Committees

- Xiaoliang Wu (Advisor: Dong (Kevin) Jin)
- Xin Wang (Advisor: Zhiling Lan)
- Hariharan Devarajan (Advisor: Xian-He Sun)
- Anthony Kougkas (Advisor: Xian-He Sun)

- Christopher Hannon (Advisor: Dong (Kevin) Jin)
- Baharet Sadat Arab (Advisor: Boris Glavic)
- Seokki Lee (Advisor: Boris Glavic)
- Maral Mesmakhosroshahi (ECE, Advisor: Joohee Kim)

Miscellaneous

TA for Introduction to Databases (NU EECS 339)

TA for Introduction to Computer Systems (NU EECS 213), 2 quarters

Designed a new parallel computing lab called SETI Lab for the NU Introduction to Computer Systems (EECS 213) course. Students are tasked with parallelizing signal analysis in the search for synthetic "alien" signals.

Co-advised masters student Shiva Rao
Topic: Feasibility of Making DVFS Decisions in the VMM
Now Senior Software Engineer at Altera

Co-advised masters student Madhav Suresh
Topic: Parallel language synchronization techniques; Deterministic and stochastic barrier synchronization

Guided and assisted undergraduate students in independent study projects:

Conor Hetland & Jonathan Ford
Topic: Prototype port of the Nautilus AeroKernel to the Intel Xeon Phi

Akhil Guliani, Billy Gross, and Panitan Wongse-ammat
Topic: Device file virtualization in the Palacios VMM

SERVICE TO DISCIPLINE

Technical Program Committee Memberships

COMPSYS 2022

ICDCS 2021, 2022

IPDPS 2020, 2021, 2022

ICCD 2019

MASCOTS 2019

VIRT 2018, 2019, 2020

MCHPC 2018, 2019, 2020, 2021

SC 2018

VHPC 2015, 2016, 2017, 2018, 2019, 2020, 2021

FiCloud 2016

CloudCom 2016, 2017, 2018, 2019, 2020

ICS 2017 (External Review Committee)

Local Chair, ICS 2017

External Reviewing

DATE 2012

ISPASS 2012, 2017

HPDC 2012, 2013, 2014, 2015

SC 2012, 2016

ICAC 2013

ICDCS 2015

OOPSLA 2016

HPCA 2017

CGO 2017

Journal Reviewing

JPDC (2019)

CCPE (2018)

SPE (2018, 2019)

TPDS (2016, 2018, 2021)

Parallel Computing (2014)

Miscellaneous

Member of ACM (SIGARCH, SIGOPS, SIGHPC)

SERVICE TO INSTITUTION

PhD Coordinator, Spring 2021

IIT CS Department committees: undergraduate studies, graduate admissions, faculty search, ad hoc TA selection, BPC working group

Helped lead creation of CS Honors degree program

Faculty advisor for Computer Science Graduate Student Association

Served as a round table discussion leader for Camras Scholars selection process (F'20)

OTHER INFORMATION

Languages

English · Native

Japanese · Advanced (conversationally fluent, reading and writing)

Spanish · Basic (simple words and phrases only)

REFERENCES

Available upon request.