

# RAGHAVENDRA PRADYUMNA POTHUKUCHI

## UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

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### Research Interests

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*Primary:* Computer architecture and systems

*Secondary:* Brain-computer interfaces (BCIs), Quantum computing, Brain-inspired AI hardware, Cognitive modeling, Formal control, Energy and power efficiency, Security, Machine learning, Datacenters and cloud, Compilers

*Current Focus:* **Building the Infinite Brain: Machines that Talk to the Brain and Think Like the Mind**

*PhD Dissertation:* **Intelligent Systems for Efficiency and Security**

### Academic Appointment

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University of North Carolina at Chapel Hill 2025–Current  
William R. Kenan Jr. Fellow Assistant Professor

Yale University 2021–2025  
Associate Research Scientist, NSF Computing Innovation Fellow (CIFellow)  
*Mentors:* Abhishek Bhattacharjee (Yale) and Jonathan Cohen (Princeton)

### Education

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Yale University 2020–2021  
Postdoctoral Associate  
*Mentors:* Abhishek Bhattacharjee (Yale) and Jonathan Cohen (Princeton)

University of Illinois at Urbana-Champaign (UIUC) 2020  
Ph.D. in Computer Science (CS)  
*Advisor:* Josep Torrellas

University of Illinois at Urbana-Champaign 2014  
M.S. in Computer Science 3.96/4.00

Birla Institute of Technology & Science, Pilani, India 2011  
B.E. (Hons.) Electrical and Electronics Engineering (EEE) 10.00/10.00

### Honors and Awards

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- » **Alnylam Scientific Excellence Award**, for demonstrating the most promising and rigorous science, highest award by Nucleate Activator, New Haven, 2025
- » **Blavatnik Regional Award for Young Scientists**, The New York Academy of Sciences, laureate in Physical Sciences & Engineering across New York, New Jersey, and Connecticut, 2024
- » **IEEE Micro Top Picks in Computer Architecture**, research selected as one of the 12 top published papers in all of computer architecture, 2024
- » **Best Paper Award**, International Symposium on Computer Architecture (ISCA), 2023
- » **Spotlight Research**, Wu Tsai Institute, Yale University, 2023
- » **Young Researcher, Heidelberg Laureate Forum (HLF)**, selected as one of the 100 young researchers in computer science worldwide invited to attend HLF, 2022.
- » **IEEE Micro Top Picks in Computer Architecture**, research selected as one of the 12 top published papers in all of

computer architecture, 2021

- » **CRA NSF Computing Innovation Fellow (CI Fellow)**, one of the 69 researchers across USA awarded by the Computing Research Association (CRA) and National Science Foundation (NSF), 2021-2024  
Press release: <https://cccblog.org/2021/07/22/announcing-the-2021-computing-innovation-fellows/>
- » **Swati and Mukul Chawla Scholarship**, Parallaxes Capital, UIUC, 2020
- » **Featured Cover Article**, *IEEE Control Systems*, 2020
- » **IEEE Computer Society Lance Stafford Larson Paper Award**, 2nd prize (2019) and 3rd prize (2018)
- » **W. J. Poppelbaum Award** for architecture design creativity, Dept. of CS, UIUC, 2018
- » **Rising Stars in Computer Architecture**, Georgia Institute of Technology, 2018
- » **Mavis Future Faculty Fellow**, College of Engineering, UIUC, 2017
- » **ACM Student Research Competition winner**, International conference on Parallel Architectures and Compilation Techniques (PACT), 2017
- » **Certificate in Foundations of Teaching**, Center for Innovation in Teaching and Learning, UIUC, 2017
- » **Best Paper Award nominee**, PACT, 2017
- » **Best Graduating Student**, Prof. L. K. Maheshwari foundation, BITS Pilani, 2011
- » **University Gold Medal** for outstanding academic achievement, BITS Pilani, 2011
- » **GE Innovation Award**, John F. Welch Technology Centre, General Electric (GE), 2010
- » **University Merit Scholarship**, BITS Pilani, 2007 – 2011

### **Industry Experience**

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**AMD Research, Austin, USA** Mar'18–May'18, May'17–Dec'17  
Coop Intern

- » Developed a modular composable resource control network for heterogeneous computers
- » Prototyped the proposed design on a 2 CPU-GPU node
- » Filed for a patent and authored a paper that was accepted at MICRO 2019

**Nvidia Graphics, Bangalore, India** Aug'11–Jun'12  
ASIC Design Engineer

- » Closed timing in multiple chips at 28 nm technology
- » Analyzed USB 2.0 IO modules in Tegra 4 mobile SoC, high-speed memory interface paths in Tesla GPGPU for high performance computing and Kepler GPU for desktop graphics

**Nvidia Graphics, Bangalore, India** Spring'11  
Hardware Design Intern

- » Developed a SPICE based timing analysis framework of multi-voltage IO paths in Nvidia's first 28 nm GPU

**Indira Gandhi Center for Atomic Research, Kalpakkam, India** Summer'09  
Research Intern

- » Developed a micrometer positioner read-out using a Programmable System on Chip (PSoC) based embedded system, and LabVIEW virtual instrumentation

## Publications

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### Preprints

- » **Regulating Next-Generation Implantable Brain-Computer Interfaces: Recommendations for Ethical Development and Implementation**  
R. Sirbu, J. Morley, T. Schroder, R. P. Pothukuchi, M. Ugur, A. Bhattacharjee, L. Floridi  
*Submitted (available at <https://arxiv.org/abs/2506.12540>), 2025.*
- » **The QUATRO Application Suite: Quantum Computing for Models of Human Cognition**  
R. P. Pothukuchi, L. Lufkin, Y Shen, A. Simon, R. Thorstenson, B. E. Trevisan, M. Tu, M. Yang, B. Foxman, V. S. Pothukuchi, G. Epping, T. H. Kyaw, B. J. Jongkees, Y. Ding, J. Busemeyer, J. D. Cohen, A. Bhattacharjee  
*Submitted (available at <https://arxiv.org/abs/2309.00597>), 2024.*
- » **PowerGrad: ML-based Hierarchical Power Management of Power-Limited Serverless Systems**  
H. Nam, R. P. Pothukuchi, A. Buyuktusunoglu, A. Amarnath, P. Bose, J. Torrellas  
*Submitted, 2025.*
- » **Mitigating Catastrophic Forgetting in Long Short-Term Memory Networks**  
K. Joshi, R. P. Pothukuchi, A. Wibisano, A. Bhattacharjee  
*arXiv, 2023.*

### Conferences

- » **Dataflow-Specific Algorithms for Resource-Constrained Scheduling and Memory Design**  
A. Bhattacharjee, Q. C. Liu, R. Manohar, R. P. Pothukuchi, M. Ugur [listed alphabetically]  
*ACM Symposium on Parallelism in Algorithms and Architecture (SPAA), Jul 2025*
- » **Foresee: A Modular and Open Framework to Explore Processing on Brain-Computer Interfaces**  
A. Yadav, F. C. Garcia, A. Gonzalez, B. E. Trevisan, A. Xu, M. Ugur, A. Bhattacharjee, R. P. Pothukuchi  
*Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Jul 2025.*
- » **FriendlyFoe: Adversarial Machine Learning as a Practical Architectural Defense against Side Channel Attacks**  
H. Nam, R. P. Pothukuchi, B. Li, N. S. Kim, J. Torrellas  
*International conference on Parallel Architectures and Compilation Techniques (PACT), Sep 2024.*
- » **SCALO: An Accelerator-Rich Distributed System for Scalable Brain-Computer Interfacing**  
K. Sriram\*, R. P. Pothukuchi\*†, O. Ye, M. Gerasimiuk, M. Ugur, R. Manohar, A. Khandelwal, A. Bhattacharjee  
\*Joint first authors †Lead PI  
*International Symposium on Computer Architecture (ISCA), Jun 2023. [21% acceptance]*  
**Best Paper Award**  
**IEEE Micro Top Picks in Computer Architecture**
- » **Distill: Domain-Specific Compilation for Cognitive Models**  
J. Vesely\*, R. P. Pothukuchi\*, K. Joshi, S. Gupta, J. D. Cohen, A. Bhattacharjee  
\*Joint first authors  
*International Symposium on Code Generation and Optimization (CGO), Apr 2022. [29% acceptance]*
- » **Maya: Using Formal Control to Obfuscate Power Side Channels**  
R. P. Pothukuchi, S. Y. Pothukuchi, P. Voulgaris, A. Schwing, J. Torrellas  
*International Symposium on Computer Architecture (ISCA), Jun 2021. [19% acceptance]*  
**IEEE Micro Top Picks in Computer Architecture**
- » **Tangram: Integrated Control of Heterogeneous Computers**  
R. P. Pothukuchi, J. Greathouse, K. Rao, L. Piga, C. Erb, P. Voulgaris, J. Torrellas  
*International Symposium on Microarchitecture (MICRO), Oct 2019. [23% acceptance]*

## 2<sup>nd</sup> Prize, IEEE Computer Society Lance Stafford Larson Paper Award

- » **Structured Singular Value Control for Modular Resource Management in Multilayer Computers**  
R. P. Pothukuchi, S. Y. Pothukuchi, P. Voulgaris, J. Torrellas  
*IEEE Conference on Decision and Control (CDC)*, Dec 2018. [60% acceptance]
- » **Yukta: Multilayer Resource Controllers to Maximize Efficiency**  
R. P. Pothukuchi, S. Y. Pothukuchi, P. Voulgaris, J. Torrellas  
*International Symposium on Computer Architecture (ISCA)*, Jun 2018. [17% acceptance]
- » **Sthira: Systematically Controlling the Error Rates in Variation-Prone Networks-on-Chip for Energy Efficiency**  
R. P. Pothukuchi, A. Ansari, B. Gopireddy, J. Torrellas  
*International conference on Parallel Architectures and Compilation Techniques (PACT)*, Sep 2017. [23% acceptance]  
**Best Paper Nominee**
- » **Using Multiple Input, Multiple Output Formal Control to Maximize Resource Efficiency in Architectures**  
R. P. Pothukuchi, A. Ansari, P. Voulgaris and J. Torrellas  
*International Symposium on Computer Architecture (ISCA)*, Jun 2016. [20% acceptance]  
**3<sup>rd</sup> Prize, IEEE Computer Society Lance Stafford Larson Paper Award**

## Workshops (peer-reviewed)

- » **The Interplay of Computing, Ethics, and Policy in Brain-Computer Interface Design**  
M. Ugur, R. P. Pothukuchi, A. Bhattacharjee  
*Workshop on Hot Topics in Ethical Computer Systems (HotEthics)*, May 2024.
- » **Towards Forever Access for Implanted Brain-Computer Interfaces**  
M. Wu, R. P. Pothukuchi, A. Bhattacharjee  
*Workshop on Hot Topics in Ethical Computer Systems (HotEthics)*, May 2024.
- » **Swapping-Centric Neural Recording Systems**  
M. Wu, R. P. Pothukuchi, A. Bhattacharjee  
*Non-Volatile Memories Workshop (NVMW)*, Mar 2024.
- » **Prefetching Using Principles of Hippocampal-Neocortical Interaction**  
M. Wu, K. Joshi, A. Sheinberg, G. Cox, A. Khandelwal, R. P. Pothukuchi, A. Bhattacharjee  
*Workshop on Hot Topics in Operating Systems (HotOS)*, Jun 2023. [26% acceptance]  
**Yale Wu Tsai Institute “Spotlight Research”**

## Journals

- » **Distributed Brain-Computer Interfacing with a Networked Multi-Accelerator Architecture**  
R. P. Pothukuchi\*, K. Sriram\*, O. Ye, M. Gerasimiuk, M. Ugur, R. Manohar, A. Khandelwal, A. Bhattacharjee  
\*Joint first authors  
*IEEE Micro, Top Picks Special Edition*, Jul-Aug 2024. [10% acceptance]
- » **HALO: Hardware-Software Co-Designed Processor for Brain-Computer Interfaces**  
I. Karageorgos, K. Sriram, X. Wen, J. Vesely, N. Lindsay, M. Wu, L. Khazan, R. P. Pothukuchi, R. Manohar, A. Bhattacharjee  
*IEEE Micro, Hot Chips Special Edition*, May 2023.
- » **Maya: Using Formal Control to Obfuscate Power Side Channels**  
R. P. Pothukuchi, S. Y. Pothukuchi, P. Voulgaris, A. Schwing, J. Torrellas  
*IEEE Micro, Top Picks Special Edition*, Jul-Aug 2022. [11% acceptance]

» **Control Systems for Computer Systems: Making Computers Efficient with Modular, Coordinated and Robust Control**

R. P. Pothukuchi, S. Y. Pothukuchi, P. Voulgaris, J. Torrellas

*IEEE Control Systems (CSM)*, Mar 2020.

**Cover Highlight Article**

**Patents**

» **Four provisional patents filed: three on BCIs (pebbling-theoretic microarchitecture design, design space exploration tool for BCI processors), and one on quantum computer scheduling**

*To be converted into full applications*, 2024

» **Distributed System of Computer Architectures**

A distributed system of ultra-low-power accelerator rich computer architectures with two-step hash-based communication, realized for a multi-region brain-computer interface

K. Sriram, R. P. Pothukuchi, R. Manohar, A. Khandelwal, A. Bhattacharjee

*U.S. Patent US 2024/0419496 A1*, 2024

» **Distributed Multi-Input Multi-Output Control Theoretic Method to Manage Heterogeneous Systems**

A distributed resource control system for efficient heterogeneous or distributed computers

R. P. Pothukuchi, J. Greathouse, L. Piga

*US Patent 10,928,789 B2*, 2021.

**Tech Reports**

» **Designing a Robust Controller for Obfuscating a Computer's Power**

R. P. Pothukuchi, S. Y. Pothukuchi, P. Voulgaris, J. Torrellas

[Online] [http://iacoma.cs.uiuc.edu/iacoma-papers/isca21\\_1\\_tr.pdf](http://iacoma.cs.uiuc.edu/iacoma-papers/isca21_1_tr.pdf), Jun 2021.

» **A Guide to Design MIMO Controllers for Architectures**

R. P. Pothukuchi, J. Torrellas

[Online] <http://iacoma.cs.uiuc.edu/iacoma-papers/mimoTR.pdf>, Apr 2016.

**Posters and Poster Papers**

» **Quantum, Cognition and Computer Systems**

Lead PI and presenter: R. P. Pothukuchi

Co-PIs (alphabetical order): A. Bhattacharjee, J. Busemeyer, J. D. Cohen, Y. Ding, B. Jongkees, and T. H. Kyaw

Students (alphabetical order): Y. Abukhadra, N. Ahn, Y. D. Chua, G. Epping, B. Foxman, C. Hann, L. Rosendahl,

Y. J. Shen, A. Simon, B. Trevisan, M. Tu, J. Wang, M. Yang

*Heidelberg Laureate Forum*, Sep 2022.

» **Multilayer Compute Resource Management with Robust Control Theory**

R. P. Pothukuchi, S. Y. Pothukuchi, P. Voulgaris, J. Torrellas

*International Conference on Parallel Architectures and Compilation Techniques (PACT)*, Sep 2017.

**Winner, ACM Student Research Competition**

» **Remote Experimentation of “No-load Tests on a Transformer” in Electrical Engineering**

Pradyumna, P. R., Tarun, C.K.S., Bhanot, S

*International Conference on Engineering Education: Innovative Practices and Future Trends (AICERA)*, Jul 2012.

**Grants**

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**PI/Co-PI**

» “Acorn: The Dawn of Very Large Scale Brain Integrated Computer Systems”, *NSF Expeditions in Computing*,

*under review as a full proposal, 2025*

PI: Abhishek Bhattacharjee, Co-PI: [Raghavendra Pradyumna Pothukuchi](#) and 10 others across computing, neuroscience, and ethics.

- » “Development of BrainScan: An Instrument for High-Bandwidth Real-Time Closed-Loop Neural Interfacing”, *NSF MRI Award #2510152*, 2025

PI: Abhishek Bhattacharjee, Co-PI: Rajit Manohar, Hitten Zaveri, [Raghavendra Pradyumna Pothukuchi](#).

- » “Next-Generation Computer Architecture for Emergent Symbolic Binding Networks”, *under preparation*, PI: Abhishek Bhattacharjee, Co-PI: Jonathan D Cohen, John Lafferty, [Raghavendra Pradyumna Pothukuchi](#).

### Writing Experience

- » “CSR: Medium: Effective Control to Maximize Resource Efficiency in Large Clusters; Hardware, Runtime, and Compiler Perspectives”, *NSF Award #1763658*, 2018

PIs: Josep Torrellas, Laxmikant Kale, David Padua at UIUC.

Media coverage: <https://dailyillini.com/news/2018/11/01/ui-professors-receive-1-2-million-grant-to-improve-computer-efficiency/>

- » “SPX: Secure, Highly-Parallel Training of Deep Neural Networks in the Cloud Using General-Purpose Shared-Memory Platforms”, *NSF Award #1725734*, 2017.

PIs: Josep Torrellas, Christopher Fletcher at UIUC.

### Visioning and Planning Workshops

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- » Co-organizer, “Defining the Role of Computing Research in Neural Interfacing”, *Computing Community Consortium (CCC) Visioning Workshop*, 2023. <https://cccblog.org/2025/02/26/ccc-announces-upcoming-workshop-on-defining-the-role-of-computing-research-in-neural-interfacing/>

- » Invitee, “Planning Workshop on Quantum Computing”, held at *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2024.

- » Invitee, “5 Year Update to the Next Steps in Quantum Computing Workshop”, *CCC Visioning Workshop*, 2023. <https://cra.org/ccc/events/5-year-update-to-the-next-steps-in-quantum-computing-workshop/>

Report: <https://arxiv.org/abs/2403.08780>

### Tutorials & Demos

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- » [R. P. Pothukuchi](#), “Brain-Computer Interfaces”, held at the *International Symposium on Microarchitecture (MICRO)*, 2023. Demo and poster.

- » [R. P. Pothukuchi](#), H. Hoffmann, K. Rao, J. Torrellas, “Combining Machine Learning and Control Theory for Computer Architecture (MCAt)”, held at the *International Symposium on Microarchitecture (MICRO)*, 2019. <http://iacoma.cs.uiuc.edu/mcat/index.html> [55 participants]

### Invited Talks

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#### Building the Infinite Brain

- » Indian Institute of Sciences, Bengaluru (India), March 2025
- » New York University, April 2024
- » University of Southern California, April 2024
- » University of Virginia, Charlottesville, April 2024
- » University of Michigan, Ann Arbor, March 2024

- » Carnegie Mellon University, March 2024
- » The NSF AI Institute for Edge Computing (Athena), March 2024
- » University of North Carolina at Chapel Hill, February 2024

#### **Quantum Systems for Cognitive Modeling**

- » Yale Quantum Institute, October 2023

#### **Machines that Talk to the Brain and Think Like the Mind**

- » University of Pennsylvania, October 2023
- » New York University, October 2023
- » Rutgers University, October 2023

#### **Hull: A New Distributed and Scalable Brain-Computer Interfacing Architecture**

- » Neurostimulation Research Meeting, Yale University, November 2023

#### **Intelligent Systems for Extreme-Efficiency and Security**

- » Georgia Institute of Technology, February 2021
- » University of California at Los Angeles, February 2020
- » Pennsylvania State University, February 2020
- » Yale University, November 2019

#### **Maya: Using Formal Control to Obfuscate Power Side-channels**

- » Intel Side Channel Academic Program, Workshop, Intel, May 2021
- » Security and Privacy Research at Illinois (SPRAI), UIUC, September 2019

#### **Extreme-Efficiency Computing**

- » Indian Institute of Sciences (IISc), Bengaluru, India, January 2019
- » Intel Research, Bengaluru, India, January 2019
- » Indian Institute of Technology (IIT), Delhi, India, January 2019
- » Rising Stars in Computer Architecture Workshop, Georgia Tech, September 2018

### ***Mentoring***

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#### **Research Mentor**

**Sep'20–Jun'25**

Yale University

- » Mentored 4 PhD students: two on Brain-Computer Interfaces (present, M. Ugur; past, K. Sriram), one on brain-inspired memory system design (M. Wu), and one on LSTM continual learning (K. Joshi).
- » Mentored 15 undergraduates on using quantum computing for cognitive modeling
- » My students received an NSF Graduate Research Fellowship, and several undergraduate fellowships at Yale like the STARS II program, Wu Tsai summer research fellowship, Andy Keidel summer grant, and the Branford Richter Fellowship, and have been admitted to top graduate programs at MIT, Princeton, and Yale.

#### **Mavis Mentor**

**Aug'16–Aug'17**

College of Engineering, UIUC

- » Mentored 2 masters students towards their thesis.

## MUSE Mentor

Aug'16–Aug'17

College of Engineering, UIUC

*MUSE: Mentoring Undergraduate Students in Engineering*

- » Mentored a sophomore in an introductory machine learning research project

## Teaching

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### Computer Architecture

Fall'16

Teaching substitute, Yale

*CPSC 420: Foundational computer architecture course (30 students)*

- » Taught four lecture sessions on cache coherency and memory consistency

### Parallel Computer Architecture

Spring'17

Teaching Assistant, UIUC

*CS 533: Graduate course on advanced architecture topics (19 students)*

- » Taught three lectures, created and graded homeworks, organized office hours

### Energy Efficient Computer Architecture

Fall'16

Teaching Assistant, UIUC

*CS 598: Discussion course on recent ideas for energy efficient architectures (10 students)*

- » Moderated and provided insights on discussions during four lecture sessions

### Computer System Organization

Fall'15

Teaching Assistant, UIUC

*CS 433: Early graduate/senior course on computer architecture (25 students)*

- » Taught two lectures, designed homeworks and examinations, and organized office hours

### Microelectronic Circuits

Fall'10

Teaching Assistant, BITS Pilani

*Course on the analysis and design of analog MOS circuits (~80 students)*

- » Led micro-teaching classes, and laboratory sessions on Cadence Virtuoso and Eldospice tools

### Engineering Graphics

Fall'08

Teaching Assistant, BITS Pilani

*Course on introductory computer aided drawing (~120 students)*

- » Developed AutoCAD laboratory modules and organized lab hours

## Service

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### Organizational Service

#### Computer Architecture Student Association (CASA)

2020–Curr.

Co-founder

<https://www.comparchsa.org/>

- » CASA's vision is to promote student wellbeing and a sense of belonging in the computer architecture community
- » Worked with SIGARCH and TCCA to establish CASA
- » Original proposal: [http://ieeetcca.org/wp-content/uploads/2020/05/Arch\\_student\\_wellbeing\\_27MAY.pdf](http://ieeetcca.org/wp-content/uploads/2020/05/Arch_student_wellbeing_27MAY.pdf)

#### Students Advising on Graduate Education (SAGE) Board

Aug'17–Aug'18

Graduate College, UIUC

- » Advisory member to the Dean on matters related to graduate affairs

**Engineering Graduate Student Advisory Committee (EGSAC)**

Aug'16–Aug'17

College of Engineering, UIUC

- » Advisory member to the Dean, College of Engineering
- » Proposed an interdisciplinary fellowship, events to promote interdisciplinary research, and student wellness

**Computer Science Graduate Academic Council (CSGAC)**

Aug'15–Aug'17

Dept. of CS, UIUC

- » Advisory member to the department on improving graduate academics

### Peer reviewing

- » **Journals:** ACM Transactions on: Internet of Things (TIOT), Quantum Computing (TQC), IEEE Transactions on: Computers (TC), Parallel and Distributed Systems (TPDS), Computer-Aided Design of Integrated Circuits and Systems (TCAD), IEEE Computer Architecture Letters (CAL), IEEE Micro, Elsevier Journal of Parallel and Distributed Computing (JPDC), Wiley Interdisciplinary Reviews (WIREs): Data Mining and Knowledge Discovery, PLOS One
- » **Conferences:** HPCA'25, ISCA'24, ISCA'23, ICPP'22, CDC'22, ISCA'22, IPDPS' 21, CDC'20

### References

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**Abhishek Bhattacharjee**

*A. Bartlett Giamatti Professor, Dept. of CS, Yale University*  
abhishek.bhattacharjee@yale.edu

**Josep Torrellas**

*Saburo Muroga Professor, Dept. of CS, UIUC*  
torrella@illinois.edu

**Yongshan Ding**

*Asst. Professor, Dept. of CS, Yale University*  
yongshan.ding@yale.edu

**Jonathan D. Cohen**

*Robert Bendheim and Lynn Bendheim Thoman Professor in Neuroscience, Princeton University*  
jdc@princeton.edu

**James E. Smith**

*Emeritus Professor, University of Wisconsin-Madison*  
*Adjunct Professor, Dept. of Electrical & Computer Engineering (ECE), CMU*  
jes.at.ece.wisc.edu@gmail.com

**Lin Zhong**

*Joseph C. Tsai Professor, Dept. of CS, Yale University*  
lin.zhong@yale.edu