Manu Awasthi

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Web www.manuawasthi.in

Research Interests

Computer architecture and systems, memory and storage systems, performance characterization and modeling, computers and society

Education

Ph.D, Computer Science 2005 - 2011
University of Utah, Salt Lake City, UT

B. Tech, Computer Science and Engineering 2001 - 2005
Institute of Technology, Banaras Hindu University (BHU), Varanasi, IN

Awards and Fellowships

- Research Excellence Fellowship, IIT Gandhinagar, 2016 - 2018
- Best Paper Award, ICPE 2015
- Second prize, Micron ADG ideas brainstorming, November 2012
- Best Paper Award, PACT 2010
- School of Computing, University of Utah Teaching Fellowship, 2005 - 2006

Experience

Visiting Researcher, Amuse Labs

Summer 2020, Bangalore, Karnataka

Associate Professor, Computer Science, Ashoka University

August 2018 - Present , Sonipat, Haryana

Assistant Professor, Indian Institute of Technology, Gandhinagar

November 2016 - August 2018, Gandhinagar, Gujarat

System Architect, Memory Solutions Lab, *Samsung Semiconductor*

December 2013 - September 2016, San Jose, CA

Architect, Architecture Development Group, *Micron Semiconductor*

October 2011 - December 2013, Boise, ID

Research Grants[1]

1. **Storage Lab Setup Grant**, Huawei India, INR 30,00,000 (2021-2022) (**PI**)
2. **In Memory Computing for Next Generation Workloads Using Emerging Memory Technologies**, SERB-SUPRA, Grant INR 27,61,880 (2021-2024) (**co-PI**)
3. **Exploring Application Driven NVM/PMEM Architectures**, Huawei India, Unrestricted Research Grant INR 26,00,000 (2021-2022) (**PI**)
4. **Fast, Robust, Energy-aware In-Memory Computing Architectures**, Semiconductor Research Corporation, USD 13,500 (2020-2023) (**co-PI**)
5. **DNNs and Datacenter Workloads: A Memory Perspective**, Lam Research, Unrestricted Research Grant USD 8,000 (2020) (**PI**)
6. **Startup Grant**, Ashoka University, INR 15,00,000 (2019-2021) (**PI**)
7. **Genomics Accelerators**, Google Cloud Platform credits, USD 5,000 (2018) (**PI**)
8. **Organization Grant for Workshop on Computer Systems**, Ashoka University, INR 2,00,000 (2018)
9. **Design of Main Memory Architectures for Next Generation Datacenter Servers** , Early Career Research Award (ECRA) from Science and Education Research Board (SERB), INR 26,24,600 (2017 - 2020) (**PI**)
10. **Organization Grant for Workshop on Memory Systems**, IIT Gandhinagar, INR 50,000 (2017)
11. IIT Gandhinagar Research Grant, INR 30,00,000 (2017 - 2020)
12. Research Excellence Fellowship, IIT Gandhinagar (2016 - 2018)

Other Grants

13. Multiscale Computational Biology: Centre for Bioinformatics & Computation Biology BIC at Ashoka University Major area: Computation Biology, Genomics and Artificial Intelligence as co-PI (**Approved for funding**)
14. DBT-BUILDER Ashoka University Interdisciplinary Life Science Programme for Advanced Research and Education, as co-PI (**under Submission**)
15. Unbiased Pattern Mining in NGS datasets: A Novel Computational Biology Approach, Department of Science and Technology, 2017 - 2020, as co-PI (**discontinued association**).

Peer-Reviewed Publications [2]

Soft copies of all recent papers are available at www.manuawasthi.in/publications/

1. **Zero Aware Configurable Data Encoding by Skipping Transfer for Error Resilient Applications**, Chandan Kumar Jha, Shreyas Singh, Riddhi Thakker, Manu Awasthi, Joycee Mekie, *IEEE Transactions on Circuits and Systems I: Regular Papers*, **IEEE TCAS–I**, May 2021

[1] The indicated amounts represent my share of the grant as PI or co-PI.
[2] 1532 Total Citations, h-index 16, April, 2021, per Google Scholar.

2. **Fixed-Posit: A Floating-Point Representation for Error-Resilient Applications** , Varun Gohil, Sumit Walia, Joycee Mekie and Manu Awasthi, *IEEE Transactions on Circuits and Systems II: Express Briefs*, **IEEE TCAS–II**, April 2021

3. **ANSim: A Fast and Versatile Asynchronous Network-On-Chip Simulator**, Tom Glint, Jitesh Sah, Manu Awasthi and Joycee Mekie, *38th IEEE International Conference on Computer Design*, **ICCD**, October 2020

4. **Prefetching in Hybrid Main Memory Systems**, Subisha V, Varun Gohil, Nisarg Ujjainkar, *Manu Awasthi*, *12th USENIX Workshop on Hot Topics in Storage and File Systems*, **HotStorage**, July 2020

5. **Exploring Trends in Higher Education in India**, Saloni Bhogale, *Manu Awasthi*, *Indian Public Policy Network Annual Conference*, March 2020

6. **Efficacy of Statistical Sampling on Contemporary Workloads: The Case of SPEC CPU2017**, Sarabjeet Singh, *Manu Awasthi*, *IEEE International Symposium on Workload Characterization*, **IISWC**, November 2019

7. **FAB: Framework for Analyzing Benchmarks**, Varun Gohil, Shreyas Singh, *Manu Awasthi*, *International Conference on Performance Engineering*, **ICPE**, *Work in Progress track*, April 2019

8. **Memory Centric Characterization and Analysis of SPEC CPU2017 Suite**, Sarabjeet Singh, *Manu Awasthi*, *International Conference on Performance Engineering*, **ICPE**, April 2019

9. **META: Memory Exploration Tool for Android Devices**, Nisarg Parikh, Varun Gohil, *Manu Awasthi*, *International Conference on Mobile Computing and Networking*, **MobiCom**, October 2018 **(Poster)**

10. **I/O Workload Management for All-Flash Datacenter Storage Systems Based on Total Cost of Ownership**, Zhengyu Yang, *Manu Awasthi*, Mrinmoy Ghosh, Janki Bhimani and Ningfang Mi, *IEEE Transactions on Big Data*, September 2018.

11. **Docker Container Scheduler for I/O Intensive Applications running on NVMe SSDs**, Janki Bhimani, Zhengyu Yang, Ningfang Mi, Jingpei Yang, Qiumin Xu, *Manu Awasthi*, Rajinikanth Pandurangan, Vijay Balakrishnan, *IEEE Transactions on Multi-Scale Computing Systems*, Vol. 4, Issue 3, September 2018

12. **Exploring Non-Volatile Main Memory Architectures for Handheld Devices**, Sneha Ved, *Manu Awasthi*, *IEEE Conference on Design Automation and Test in Europe*, **DATE**, March, 2018

13. **Rack Level Scheduling for Containerized Workloads**, Qiumin Xu, Krishna T. Malladi, *Manu Awasthi International Conference on Networking, Architecture, and Storage*, **NAS**, August, 2017 **(Poster)**

14. **Performance Analysis of Containerized Applications on Local and Remote Storage**, Qiumin Xu, *Manu Awasthi*, Krishna T. Malladi, Janki Bhimani, Jingpei Yang, Murali Annavaram, *International Conference on Massive Storage Systems and Technology*, **MSST**, May, 2017

15. **Docker Characterization on High Performance SSDs,** Qiumin Xu, *Manu Awasthi*, Krishna T. Malladi, Janki Bhimani, Jingpei Yang, Murali Annavaram, *International Symposium on Performance Analysis of Systems and Software*, **ISPASS**, April, 2017 **(Poster)**

16. **KOVA : A tool for Kernel Visualization and Analysis** Manu Awasthi, Krishna T. Malladi, *International Performance Computing and Communications Conference*, **IPCCC**, December 2016 **(Poster)**

17. **Understanding Performance of I/O Intensive Containerized Applications for NVMe SSDs** Janki Bhimani, Jingpei Yang, Zhengyu Yang, Ningfang Mi, Qiumin Xu, Manu Awasthi, Rajinikanth Pandurangan, Vijay Balakrishnan, *International Performance Computing and Communications Conference*, **IPCCC**, December 2016

18. **A Fresh Perspective on the Total Cost of Ownership of SSDs** Zhengyu Yang, Manu Awasthi, Mrinmoy Ghosh, Ningfang Mi, *International Conference on Cloud Computing Technology and Science*, **CloudCom**, December 2016

19. **FlexDrive: A Framework to Explore NVMe Storage Solutions** Krishna T. Malladi, Manu Awasthi, Hongzhong Zheng, *International Conferences on High Performance Computing and Communications*, **HPCC**, December, 2016

20. **DRAMScale: Mechanisms to increase DRAM Capacity** Krishna T. Malladi, Manu Awasthi, Hongzhong Zheng, *International Conference on Memory Systems*, **MEMSYS**, October, 2016

21. **DRAMPersist: Making DRAM Systems Persistent** Krishna T. Malladi, Manu Awasthi, Hongzhong Zheng, *International Conference on Memory Systems*, **MEMSYS**, October, 2016

22. **Software-Defined Emulation Infrastructure for High Speed Storage** Krishna T. Malladi, Manu Awasthi, Hongzhong Zheng, *International Systems and Storage Conference*, **SYSTOR**, May, 2016 **(Poster)**

23. **Rethinking Design Metrics for Datacenter DRAM** Manu Awasthi, *International Conference on Memory Systems*, **MEMSYS**, October, 2015

24. **Performance Analysis of NVMe SSDs and their Implication on Real World Databases** Qiumin Xu, Huzefa Siyamwala, Mrinmoy Ghosh, Manu Awasthi, Tameesh Suri, Zvika Guz, Anahita Shayesteh, Vijay Balakrishnan, **SIGMETRICS**, June, 2015 **(Poster)**

25. **Performance Characterization of Hyperscale Applications on NVMe SSDs** Qiumin Xu, Huzefa Siyamwala, Mrinmoy Ghosh, Tameesh Suri, Manu Awasthi, Zvika Guz, Anahita Shayesteh, Vijay Balakrishnan, *International Systems and Storage Conference*, **SYSTOR**, May, 2015

26. **Performance Characterization of Realistic Hyperscale Applications on NVMe SSDs** Qiumin Xu, Manu Awasthi, Tameesh Suri, Zvika Guz, Anahita Shayesteh, Mrinmoy Ghosh, Vijay Balakrishnan, *Annual Non-Volatile Memories Workshop*, **NVMW**, March, 2015 (Poster)

27. **System Level Characterization of Datacenter Applications** Manu Awasthi, Tameesh Suri, Zvika Guz, Anahita Shayesteh, Mrinmoy Ghosh, Vijay Balakrishnan, *International Conference on Performance Engineering*, **ICPE**, February, 2015 (Best Paper Award)

28. **Real-Time Analytics as the Killer Application for Processing-In-Memory** Zvika Guz, Manu Awasthi, Vijay Balakrishnan, Mrinmoy Ghosh, Anahita Shayesteh, Tameesh Suri, *Workshop on Near Data Processing*, **WoNDP**, December, 2014

29. **Performance Analysis of Multi-Channel DDR3 DRAM** Manu Awasthi, David A. Roberts, Robert Walker, J. Thomas Pawlowski, *Micron DRAM Products Technical Seminar*, **DPTS**, September, 2012

30. **Full-system, Memory-Oriented Performance Modeling Tools using Multi-Core CPUs and GPUs** David A. Roberts, Manu Awasthi, Robert Walker, J. Thomas Pawlowski, *Micron DRAM Products Technical Seminar*, **DPTS**, September, 2012

31. **USIMM : the Utah SImulated Memory Module** Niladrish Chatterjee, Rajeev Balasubramonian, Manjunath Shevgoor, Seth Pugsley, Aniruddha Udipi, Ali Shafiee, Manu Awasthi, Kshitij Sudan, Zeshan Chisti, *University of Utah, School of Computing Technical Report TR-UUCS-12-002, Technical Report for JWAC Memory Scheduling Competition*, February 2012

32. **Managing Resistance Drift in Phase Change Memory** Manu Awasthi, Manjunath Shevgoor, Kshitij Sudan, Rajeev Balasubramonian, Bipin Rajendran, Viji Srinivasan, *International Conference on High Performance Computer Architecture*, **HPCA**, February 2012

33. **Predictor-Based Management of DRAM Row-Buffers in the Many-Core Era** Manu Awasthi, David Nellans, Kshitij Sudan, Rajeev Balasubramonian, Al Davis, *International Conference on Parallel Architectures and Compilation Techniques*, **PACT**, September, 2011 (poster track)

34. **Managing Data Placement in Memory Systems with Multiple Memory Controllers** Manu Awasthi, David Nellans, Kshitij Sudan, Rajeev Balasubramonian, Al Davis, *International Journal of Parallel Programming*, **IJPP**, Volume 40, Issue 1, 2011

35. **Handling PCM Resistance Drift with Device, Circuit, Architecture and System Solutions** Manu Awasthi, Manjunath Shevgoor, Kshitij Sudan, Rajeev Balasubramonian, Bipin Rajendran, Viji Srinivasan, *Annual Non-Volatile Memories Workshop*, **NVMW**, March, 2011

36. **Handling the Problems and Opportunities Posed by Multiple On-Chip Memory Controllers** Manu Awasthi, David Nellans, Kshitij Sudan, Rajeev Balasubramonian, Al Davis, *International Conference on Parallel Architectures and Compilation Techniques*, **PACT**, September, 2010 (Best Paper Award)

37. **Increasing DRAM Efficiency with Locality-Aware Data Placement** Kshitij Sudan, Niladrish Chatterjee, David Nellans, Manu Awasthi, Rajeev Balasubramonian, Al Davis, *International Conference on Architectural Support for Programming Languages and Operating Systems*, **ASPLOS**, March, 2010

38. **Dynamic Hardware-Assisted Software Controlled Page Placement to Manage Capacity Allocation and Sharing within Large Caches** Manu Awasthi, Kshitij Sudan, Rajeev Balasubramonian, John Carter, *International Conference on High Performance Computer Architecture*, **HPCA**, February, 2009
39. **Scalable and Reliable Communication for Hardware Transactional Memory** Seth Pugsley, Manu Awasthi, Niti Madan, Naveen Muralimanohar, Rajeev Balasubramonian, *International Conference on Parallel Architecture and Compilation Techniques*, **PACT**, October, 2008
40. **Understanding the Impact of 3D Stacked Layouts on ILP** Manu Awasthi, Vivek Venkatesan, Rajeev Balasubramonian, *Journal of Instruction Level Parallelism*, **JILP**, Volume 9, 2007
41. **Exploring the Design Space for 3D Clustered Architectures** Manu Awasthi, Rajeev Balasubramonian, *IBM Watson Conference on Interaction between Architecture, Circuits, and Compilers*, **P=ac^2**, October, 2006

Popular Media Articles

1. How the Indian Government Can Help Improve the Ease of Doing Research, The Wire, 30^{th} June, 2020
2. Why I Science When Others Protest, The Wire, 31^{st} December, 2019

Patents and Patent Applications

1. Data management scheme in virtualized hyperscale environments, US-10725663-B2, **(Granted)**
2. Memory device having a translation layer with multiple associative sectors, US-9898200-B2,**(Granted)**
3. Intelligent controller for containerized applications, US-10210024-B2,**(Granted)**
4. Rack-level scheduling for reducing the long tail latency using high performance SSDs, US-10628233-B2, **(Granted)**
5. Address translation in memory, US-2016147667-A1, *(Application)*
6. High bandwidth peer-to-peer switched key-value caching, US-9723071-B2, **(Granted)**
7. Block cleanup: page reclamation process to reduce garbage collection overhead in dual-programmable NAND flash devices, US-2020278805-A1 *(Application)*
8. Online flash resource migration, allocation, retire and replacement manager based on a cost of ownership model, US-10248348-B2, **(Granted)**
9. I/O workload scheduling manager for RAID/non-RAID flash based storage systems for TCO and WAF optimizations, US-10282140-B2, **(Granted)**
10. Multi-bit data representation framework to enable dual program operation on solid-state flash devices, US-10474567-B2, **(Granted)**
11. Computing system with parallel mechanism and method of operation thereof, US-2016188534-A1,*(Application)*

Teaching

1. Summer 2021, Storage Systems (UG/PG), ACM India Summer School on Program Execution, 2021
2. Spring 2021, CS 1217 Operating Systems (UG) (offered online)
3. Monsoon 2020, CS 1216 Computer Organization and Systems (UG) (offered online)
4. Monsoon 2020, CS 1319, Programming Language Design and Implementation (UG) (offered online)
5. Spring 2020, CS 1217 Operating Systems (UG) (offered partially online)
6. Spring 2020, CS 2420 Advanced Computer Architecture (UG/PG) (offered partially online)
7. Monsoon 2019, CS 1216 Computer Organization and Systems (UG)
8. Monsoon 2019, CS 1319, Programming Language Design and Implementation (UG)
9. Spring 2019, CS 1217 Operating Systems (UG)
10. Spring 2019, CS 2420 Advanced Computer Architecture (UG/PG)
11. Monsoon 2018, CS 1216 Computer Organization and Systems (UG)
12. Monsoon 2018, CS 1319, Programming Language Design and Implementation (UG)
13. Spring 2018, ES 215, Computer Organization and Architecture (UG, IIT Gandhinagar)
14. Monsoon 2017, CS 612, Computer Systems (PG, IIT Gandhinagar)
15. Monsoon 2017, FP 101, Foundation Program (UG, IIT Gandhinagar)
16. Spring 2017, CS 326, Computer Architecture (UG, IIT Gandhinagar)
17. Summer 2017, Fall 2017, Spring 2018 Systems Reading Group (Seminar)

Curriculum Development

1. **CS 2420, Advanced Computer Architecture**: I designed and taught the first offering of the PG course on advanced computer architecture at Ashoka, which introduced students to advanced concepts in computer architecture and provided them their first exposure to computer systems' research literature. The course was designed as a unique combination of lectures, research paper discussions and student led research paper presentations.
2. **CS 326/ES 215, Computer Architecture (UG/PG)**: Designed and taught the first course on Computer Architecture at IIT Gandhinagar. I designed the curriculum from scratch keeping in mind the relevant training of the students at IIT Gandhinagar at the time.
3. **CS 612, Computer Systems**: Designed and taught the first offering of the PG course on Computer Systems, which encompasses elements of computer architecture, operating systems and distributed systems for early stage graduate students. The course was formatted to serve as a refresher for the fundamentals taught in undergraduate classes and add a number of hands-on, implementation based assignments to give the students a broad overview of the possibilities in the area.

Research Tool Development

1. **Fixed Posit Emulator** is a Pin tool that can replaces single-precision IEEE-754 multiplications with fixed-posit multiplications, allowing the users to carry out comparative analysis between the two different types of number systems using multiple applications. The tool can be downloaded here.
2. **ANSim : the Utah SImulated Memory Module** is a fast and versatile Asynchronous Network-on-Chip (NoC) Simulator. ANSim can model routers with different delays, routers with asynchronous arbitration, connected in a wide range of topologies. ANSim supports individual routers modeled to have varying timing constraints and supports synthetic and real-workloads, and produces system-level latency, throughput, power, power-gating, and arbitration reports. The tool can be downloaded here.
3. **USIMM : the Utah SImulated Memory Module** I contributed to the development of USIMM, a trace-based simulation infrastructure for modeling the DRAM sub-system, including timing parameters and memory controller functionalities. The tool can be downloaded here.

Unrefereed Posters

1. **ABP : Predictor Based Management of DRAM Row Buffers**, School of Computing , University of Utah Graduate Research Day, Spring 2010
2. **Controlling Page Placement to Manage Large Caches** (Best Poster Runner-up), School of Computing , University of Utah Graduate Research Day, Spring 2009
3. **Scalable and Reliable Communication for Hardware Transactional Memory**, School of Computing , University of Utah Graduate Research Day, Spring 2008
4. **Understanding the Impact of 3D Stacked layouts on ILP, School of Computing** , University of Utah Graduate Research Day, Spring 2007

Conference and Workshop Organization

1. **CAWS 2020**: Computer Architecture Winter School. December, 2020. Organizer. CAWS was a four day winter school organized to bring together researchers from industry and academia to talk about recent advances in computer systems, including computer architecture, compilers and operating systems.
2. **WoCS 2018**: **W**orkshop on **C**omputer **S**ystems. December, 2018. Organizer. WoCS was a two day workshop organized to bring together researchers from industry and academia to talk about recent advances in computer systems, including computer architecture, compilers, operating systems and programming languages.
3. **ROCS 2017**: **R**esearch **O**pportunities in **C**omputer **S**cience, February, 2017, co-organizer. ROCS was a one day event held at IIT Gandhinagar to introduce undergraduates and early stage graduate students to various research opportunities in computer science and engineering.
4. **WoMS 2017**: **W**orkshop on **M**emory and **S**torage Systems. December, 2017. Organizer. WoMS was a two day workshop organized to bring together researchers from

industry and academia to collaborate towards solving the most pressing issues in memory and storage systems.

Outreach

1. High School teacher training - Kendriya Vidyala (KV) Computer Science teachers. Taught computer architecture and audrino related concepts to 55 KV teachers (June 2018).
2. Vigyan Jyoti - Taught computer architecture and audrino related concepts to class 11^{th} girl students under Government of India's Vigyan Jyoti scheme (June 2018)

Mentoring

Current

1. Tom Glint Issac, PhD student, co-supervised with Prof. Joycee Mekie (IITGn), since Monsoon 2017
2. Soham Bagchi (Undergraduate student, Ashoka University) (Summer Intern, 2021)
3. Vibodh Nautiyal (Undergraduate student, Ashoka University) (Summer Intern, 2021)
4. Nikhil Bhave (Undergraduate student, Ashoka University) (Summer Intern, 2021)

Past

1. Varun Gohil, Research Fellow, July 2020 - July 2021.
2. Deepraj Pandey (Undergraduate student, Ashoka University), Capstone Project, Monsoon 2021
3. Sarabjeet Singh, Junior Research Fellow, Jan 2018 - July 2019.
4. Prathamesh Upadhyay, M.Tech student, co-supervised with Prof. Neeldhara Misra (IIT Gandhinagar), graduated August 2020.
5. Subisha V, M.Tech student, graduated July 2019
6. Nisarg Ujjainkar, IIT Gandhinagar, Intern, Summer 2019
7. Kshitij Kapoor, Ashoka University, Intern, Summer 2019
8. Deepraj Pandey, Ashoka University, Intern, Summer 2019
9. Varun Gohil, IIT Gandhinagar, Intern, Summer 2018
10. Nisarg Parikh, LD College of Engineering, Summer 2018
11. Sanjith Athlur, PES University, Intern, Summer 2017
12. Indraneel Sarkar, NIT Durgapur, Intern, Summer 2017
13. Qiumin Xu, University of Southern California, Intern, Summer 2016
14. Narges Shahidi, Pennsylvania State University, Intern, Spring 2016
15. Nabarun Nag, University of Wisconsin - Madison, Intern, Summer 2015
16. Zhengyu Yang, Northeastern University, Intern, Summer 2015
17. Kevin Chang, Carnegie Mellon University, Intern, Summer 2014

Other Academic Experience

1. Graduate Research Assistant, University of Utah (June 2006 - June 2011)
2. Graduate Research Intern, AMD (May 2009 - September 2009)
3. Graduate Teaching Assistant, University of Utah (August 2005 - May 2006)

Invited Talks

1. Mitigating Data Movement in Memory and Storage Systems Opportunities and Challenges, IEEE Data & Storage Summit, Bangalore/Virtual, June 2021.
2. Computer Systems: Work horses of Digital Era, Beyond The Classroom, (Virtual) February 2020 (Outreach)
3. Science of the Internet, Talk to A Scientist, (Virtual) February 2020 (Outreach)
4. Computer Architecture, In-service course for Post-Graduate trained (PGT) teachers of Kendriya Vidyalaya, IIT Gandhinagar (Virtual), December 2020 (Outreach)
5. NVMs in the Memory Hierarchy: From Smartphones to Servers, IEEE Data & Storage Summit, Bangalore/Virtual, November 2020.
6. How Computers Work, In-service course for Post-Graduate trained (PGT) teachers of Kendriya Vidyalaya, IIT Gandhinagar (Virtual), July 2020 (Outreach)
7. Main Memory Design Considerations for Handheld Devices: A Case for Non Volatile Memories, IIIT Delhi, February 2020.
8. Invited Panelist on *Security in Microprocessors: The Road Ahead*, MAST 2019
9. Non Volatile Main Memory for Handheld Devices: An idea whose time has come, Department of Computer Science, Ashoka University, September 2019
10. Non Volatile Main Memory for Handheld Devices: An idea whose time has come, SNIA-SDC, Bangalore, May 2019
11. Memory Architectures for Handheld Devices, ARM Bangalore, February 2019
12. Building Computer Systems for The Indian Context, Microsoft Research India, Bangalore, February 23, 2019.
13. Handheld Device Architectures: Are We Doing Enough? Workshop on Computer Systems, Ashoka University, Sonepat, December 2018.
14. NVMs : A Study in Use Cases, Workshop on Memory and Storage Systems, IIT Gandhinagar, Gandhinagar, December 2017.
15. Architecting Memory and Storage Hierarchies for Modern Computer Systems, Ashoka University, Sonipat, October 2017.
16. Architecting Memory and Storage Hierarchies for Future Servers, Intel Research, Bangalore, January 2017.
17. Importance of Data Locality in Servers (aka - how do I get to my data faster?), Indian Institute of Technology (IIT), Gandhinagar, November 2015

18. Importance of Data Locality in Servers (aka - how do I get to my data faster?), Indian Institute of Technology (IIT), Bombay, November 2015
19. Unlocking System Performance with NVMe Flash, Texas A & M University, September 2015
20. Unlocking System Performance with NVMe Flash, University of Texas, Austin, September 2015
21. Memory and Storage System Design for Datacenters : Challenges and Opportunities, Indraprastha Institute of Information Technology (IIIT), Delhi, April 2015
22. Memory and Storage System Design for Datacenters : Challenges and Opportunities, Indian Institute of Technology (IIT), Delhi, April 2015
23. System Level Characterization for Datacenter Applications, ICPE 2015.
24. Micron Friday Forum company-wide talk on research activities in Architecture Development Group (ADG), November 2012
25. Efficient Scrub Mechanisms for Error-Prone Emerging Memories, HPCA 2012
26. Managing Data Locality in Future Memory Hierarchies Using a Hardware Software Codesign Approach, Micron 2011
27. Managing Data Locality in Future Memory Hierarchies Using a Hardware Software Codesign Approach, Intel 2011
28. Managing Data Locality in Future Memory Hierarchies Using a Hardware Software Codesign Approach, Fusion-IO, 2011
29. Dynamic Page Placement to Manage Capacity, Replication, and Sharing within Large Caches, HPCA 2009
30. Exploring the Design Space for 3D Clustered Architectures, IBM P=ac2, 2006

Professional Service

1. Technical Program Committee Member, The 34th International Conference on VLSI Design and 19th International Conference on Embedded Systems (VLSID), January 2021
2. Expert Panel Member for Screening of the Letter of Intent (LoI) received against the DST call on Integrated Clean Energy Material Acceleration Platform (IC-MAP), December 2020
3. Technical Program Committee Member, IEEE International Conference on High Performance Computing, Data and Analytics (HiPC), December 2020
4. Technical Program Committee Member, 24^{th} International Conference on VLSI Design and Test, July 2020
5. Publicity Co-Chair, International Conference on Big Data Analytics (BDA), December 2020.
6. Invited Reviewer, IEEE Embedded Systems Letters, June 2020.

7. Invited Reviewer, Journal of Parallel and Distributed Computing (JPDC), June 2020.
8. Technical Program Committee Member, 14^{th} ACM Inter-Research Institute Student Seminar in Computer Science (IRISS), February, 2020.
9. Technical Program Committee Member, Memory Design Track Co-Chair, International Conference on VLSI Design (VLSID), January 2020.
10. Invited Reviewer, Journal of Distributed and Parallel Databases (DAPD), October 2019.
11. Invited Reviewer, Computer Architecture Letters (CAL), July, September 2019.
12. Invited Reviewer, ACM/EDAC/IEEE 56^{th} Design Automation Conference (DAC), June 2019
13. External Review Committee member, HPCA, February 2019
14. Technical Program Committee member, Big Data Analytics (BDA), December 2018
15. Technical Program Committee member, VLSID 2019
16. Technical Program Committee member, Workshop on Software Challenges to Exascale Computing, SCEC 2018
17. Invited reviewer for Journal of Parallel and Distributed Computing 2018, Microprocessors and Microsystems, 2018
18. Invited External Thesis Reviewer, IIT Delhi, Department of Computer Science and Engineering, 2018
19. Invited Reviewer, ACM/EDAC/IEEE 55^{th} Design Automation Conference (DAC), 2018
20. Program Committee Member, International Conference on VLSI Design (VLSID) 2018
21. Invited Reviewer, Integration, the VLSI Journal, Elsevier, 2017
22. Proceedings of the (Indian) National Academy of Sciences, Physical Sciences (NASA), 2017
23. National Science Foundation (NSF) CSR Panel, 2015
24. IEEE Micro Special Issue on Near Data Computation, 2015
25. ACM Transactions on Architecture and Code Optimization (ACM TACO) 2014
26. Micron internal reviewer for SRC FCRP proposals, 2012
27. IEEE/ACM International Symposium on Microarchitecture (MICRO) 2011
28. ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming 2010
29. ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming 2009
30. IEEE International Conference on Computer Architecture (HPCA) 2008
31. IEEE International Conference on High Performance Computing (HiPC), 2008

Service

1. Steering Committee, Centre for Climate Change and Sustainability, Summer 2020 - date
2. Member, ACM India Publicity & Membership committee, Summer 2020 - date
3. PhD Coordinator, Department of Computer Science, Ashoka University, Spring 2020 - Summer 2021
4. Member, University Committee Academic Freedom, 2021
5. Member, University Committee on Innovations in Online Teaching, 2020
6. Member, University Examination Committee, 2019 - date
7. Member, Foundation Course Steering Committee, 2019 - date
8. Member, University Committee for Outreach of Science Departments (unofficial), 2019