Sparsh Mittal

Curriculum Vitae

Employment

Associate professor at ECE department, IIT Roorkee from 08/2024 onwards. Also, a joint faculty at Mehta Family School of Data Science (DS) and Artificial Intelligence (AI) at IIT Roorkee. IEEE Senior member

Assistant professor at ECE department, IIT Roorkee from 12/2019 to 08/2024.

Assistant professor at CSE department, IIT Hyderabad from 09/2016 to 12/2019.

Postdoctoral Research Associate at Oak Ridge National Lab (USA) from 09/2013 to 09/2016

Current research areas: Artificial intelligence (AI) for computer-vision, applications of AI/ML/DL, accelerators for AI, computer architecture, VLSI, approximate computing.

Education

Ph.D., Computer Engineering , 2008-2013, Iowa State University (ISU), USA.
Thesis topic: *Dynamic Cache Reconfiguration Based Techniques for Improving Cache Energy Efficiency*

B.Tech., Electronics and Communications Engineering 2004-2008
Indian Institute of Technology (IIT) Roorkee, Uttarakhand, India. GPA: 9.58/10.0

Honors and Awards

I was shortlisted in the list of top-5 faculty members for IITR's excellence in teaching award 2024 in two categories: UG course with more than 80 students (2nd rank) and UG course with more than 30 students (taught by a young faculty member) (3rd rank).

"Best Industry-Related Paper" Award at ICPR 2024 conference.

"Best paper award honorable mention" at AIMLSystems Conference (Bengaluru) 2023

"Best student paper award" at VLSI Design Conference (Kolkata) 2024.

"Best paper award" at COMSNETS India Internet Governance Workshop (Bengaluru) 2024

My research on transliteration of Modi script to Devanagari was covered by IndiaToday and HinduBusinessLine.

My research on mobile phone detection was praised by Education Minister of India (1, 2, 3). Also, it was covered by HinduBusinessLine, TimesOfIndia, AndhraJyothy, TelanganaToday & TheHansIndia.

My research on 3D SRAM for HPC systems has featured on NextPlatform.

Yash Jain and Vishu Saxena, whom I advised for BTech project, won the best BTech project award in ECE Department, IIT Roorkee in 2023.

Yash and Vishu also won the "Best Innovation" award in the "Professional Development and Innovation Award" scheme at IIT Roorkee (This award was established by 1983 batch alumni of IITR).

My PhD student Maruthi Inukonda received Best Cloud Innovator of the Year 2021 in Cloud Management from Cloud Computing Innovation Council of India.

Received *Distinguished Contribution* rating at ORNL based on 2013-2014 performance appraisal. This rating recognizes the top 10 percent of staff and is the topmost rating for research staff.

Received *Outstanding Contribution* rating at ORNL based on 2014-2015 performance appraisal. Also received a performance award and mid-year salary increment in both 2013-2014 and 2014-2015.

Received top-up salary at IIT Hyderabad, which is given to very few selected faculty members.

Google Scholar Citations: 9500. h-index: 46. i10-index: 106.

Best student paper finalist in SC (Supercomputing) 2014, world's biggest HPC conference with 10,000+ attendees.

ECpE Fellowship of $2500 and Peer Research Award of $200 from ISU

Sumer Chand Jain Scholarship of INR 10,000 at IIT Roorkee.

Silver Medal for getting highest GPA in Electronics batch of year 2008 in ECE department, IIT Roorkee.

Silver Medal for best B.Tech project in Electronics batch of year 2008 in ECE department, IIT Roorkee.

Best Student Award from High School (named MHS, Jaipur) in 2004. Topper throughout school.

Funded projects (all as sole-PI)

Research Projects		
Agency	**Title/duration**	**Amount**
SERB Start-up Research Grant	Secure & Reliable Non-volatile Memories for Ultra-low Power Applications (2017-2020)	45 Lakh
SERB Core Research Grant	Designing Secure and Robust Artificial Intelligence (AI) Algorithms and Accelerators (2023-2026)	25 Lakh
Semiconductor Research Corporation (USA)	Designing Efficient Hardware Accelerators for Autonomous Driving Vehicles (2018-2021)	25 Lakh
Qualcomm Faculty Award	2024-onwards	12.5 Lakh
Intel PhD Fellowship (for any of my student)	2017-2021	22 Lakh
Startup Grant at IITH and IITR		25 Lakh
Consultancy Projects		
TCS	Architecture for Accelerating Al workloads (2022-2025)	34 Lakh
Bosch	Exploration of Generative AI for Industrial Synthetic Data Generation (2024-2025)	8 Lakh

Invited talks/panel-discussions

Panel discussion: 'HPC and AI: two sides of same coin' by ACM India and TCS Research 2023.

Conferences: 1. ISC Conference (Germany) 2016. ISC is the biggest HPC conference in Europe with nearly 3000 attendees. 2. PARCOMPTECH (Bengaluru) Organized by C-DAC and MeitY 2017.

Companies: Xilinx (Hyderabad) 2019, Intel (Bangalore) 2017.

Universities: New York University, University of Michigan, VelTech University (Chennai), MSRIT (Bengaluru), NIT Jalandhar, Anurag Group of Institutions (Hyderabad), DIT University (Dehradun), JIIT (Noida).

Hospitals: AIIMS Rishikesh (In the webinar on "Artificial Intelligence for Medicine" under the aegis of Telemedicine Society of India, Uttarakhand Chapter).

Patents

Ratul Kishore Saha, Manoj Karunakaran Nambiar, Rekha Singhal, and Sparsh Mittal. Method and system for content-aware deployment of artificial intelligence workloads in edge-cloud ecosystem, 2025. Indian Patent 202,521,042,858 (filed on 2 May 2025).

Maruthi S. Inukonda, Jessy Bondla, Arjun Reddy, and Sparsh Mittal. Method and system for privacy-preserving continuous internet forensics, 2022. Indian Patent 202,241,035,158 (filed on 20 June 2022).

Maruthi S. Inukonda, Jessy Bondla, Arjun Reddy, and Sparsh Mittal. Methods and systems for privacy-preserving federated continuous internet forensics, 2023. Indian Patent 202,341,041,491 (filed on 19 June 2023).

Aaditi Kapre, Shruti Kunde, Sparsh Mittal, and Rekha Singhal. System and methods for hyperspectral image processing in remote sensing using reflexivity based approximate computing, 2023. Indian Patent 202,321,078,005 (filed on 16 November 2023).

Publications (partial list)

Journal papers are numbered [J1], [J2], etc.; Conferences papers as [C1], [C2], etc. and Review papers as [R1], [R2], etc. Papers with (Corresponding Author)mark are where I am corresponding author.

Onkar Susladkar, Jishu Sen Gupta, Chirag Sehgal, Sparsh Mittal, and Rekha Singhal. MotionAura: Generating High-Quality and Motion Consistent Videos using Discrete Diffusion. In *International Conference on Learning Representations (ICLR)* ***(Core A* rank conference)***, 2025. [C1] (Corresponding Author).

Harshal Kausadikar, Tanvi Kale, Onkar Susladkar, and Sparsh Mittal. Historic Scripts to Modern Vision: A Novel Dataset and A VLM Framework for Transliteration of Modi Script to Devanagari. In *19th International Conference on Document Analysis and Recognition (ICDAR)* ***(Core A rank conference)***, China, 2025. [C2] Link.

Vishesh Mishra, Sparsh Mittal, and Urbi Chatterjee. Novel Hybrid Probabilistic-Statistical Error Metrics for Approximate Adders. *Journal of Systems Architecture* ***(Q1 journal)***, 2025. (Impact Factor 3.8) [J1] (Corresponding Author) Link.

Priyanshu Tyagi and Sparsh Mittal. A 101 TOPS/W and 3.2 TOPS/mm^2 6T SRAM-Based Digital Compute-in-Memory Macro Featuring a Novel 2T Multiplier. In *Design, Automation and Test in Europe (DATE) (Core B rank conference)*, France, 2025. [C3] (Corresponding Author).

Cheena Singhal and Sparsh Mittal. A 6T SRAM based reconfigurable in-memory XOR/XNOR and accumulation architecture. In *IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, Greece, 2025. [C4] (Corresponding Author).

Ratul Kishor Saha, Sparsh Mittal, Rekha Singhal, and Manoj Nambiar. CADAEC: Content-Aware Deployment of AI Workloads in Edge-Cloud Ecosystem. In *International Conference on Performance Engineering (ICPE) (Industry Track) (Core B rank conference)*, 2025. [C5] Link.

Vishu Saxena, Yash Jain, and Sparsh Mittal. A Deep Learning based Approach for Semantic Segmentation of Small Fires from UAV Image. *Remote Sensing Letters*, 2025. (Impact Factor 1.4) [J2] (Corresponding Author) Link.

Aabid Amin Fida and Sparsh Mittal. Stochastic Memristive Devices for Low Cost Learning of Spatiotemporal Signals in Spiking Neural Networks. *IOP Engineering Research Express* ***(Q2 journal)***, 2025. (Impact Factor 1.5) [J3] (Corresponding Author) Link.

Dhayan Dhananjaya Senanayake, Priyanshu Tyagi, Sparsh Mittal, and Rekha Singhal. An SRAM-based Multi-Operand Architecture Implementing Multi-Bit Boolean Functions Using In-Memory Periphery Computing. In *International Conference on VLSI Design*, 2025. [C6] (Corresponding Author) Link.

Onkar Susladkar, Gayatri Deshmukh, Vandan Gorade, and Sparsh Mittal. GRIZAL: Generative Prior-guided Zero-Shot Temporal Action Localization. In *The 2024 Conference on Empirical Methods in Natural Language Processing* ***(Core A* rank conference)***, USA, 2024. [C7] (Corresponding Author) Link.

Vandan Gorade, Sparsh Mittal, Debesh Jha, Rekha Singhal, and Ulas Bagci. Harmonized Spatial and Spectral Learning for Generalized Medical Image Segmentation. In *International Conference on Pattern Recognition (ICPR) (Core B rank conference)*, Kolkata, India, 2024. (Selected for oral presentation, "Best Industry-Related Paper" Award) [C8] (Corresponding Author) Link.

Aabid Amin Fida, Sparsh Mittal, and Farooq Ahmad Khanday. Mott memristor based stochastic neurons for probabilistic computing. *IOP Nanotechnology* ***(Q2 journal)***, 35(29), 2024. (Impact Factor 3.5) [J4] (Corresponding Author) Link.

Onkar Susladkar, Gayatri Deshmukh, Sparsh Mittal, and Parth Shastri. D2Styler: Advancing Arbitrary Style Transfer with Discrete Diffusion Methods. In *International Conference on Pattern Recognition (ICPR) (Core B rank conference)*, Kolkata, India, 2024. [C9] (Corresponding Author) Link.

Anurag Kamal, Vishesh Mishra, Sparsh Mittal, Mahendra Rathor, Chandan Kumar, and Urbi Chatterjee. Sorting Attacks Resilient Authentication Protocol for CMOS Image Sensor Based PUF. In *Asian Hardware Oriented Security and Trust Symposium (AsianHOST)*, Japan, 2024. [C10] .

Vandan Gorade, Sparsh Mittal, Debesh Jha, and Ulas Bagchi. SynergyNet: Bridging the Gap between Discrete and Continuous Representations for Precise Medical Image Segmentation. In *Proceedings of IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)* ***(Core A rank conference)***, pages 7753–7762, USA, 2024. [C11] (Corresponding Author) Link.

Vandan Gorade, Sparsh Mittal, Debesh Jha, and Ulas Bagchi. Rethinking Intermediate Layers design in Knowledge Distillation for Kidney and Liver Tumor Segmentation. In *IEEE International Symposium on Biomedical Imaging (ISBI)*, Greece, 2024. [C12] (Corresponding Author)**(Oral presentation)**.

Gayatri Deshmukh, Onkar Susladkar, Dhruv Makwana, Sparsh Mittal, and S.C. Teja. Textual Alchemy: CoFormer for Scene Text Understanding. In *Proceedings of IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)* ***(Core A rank conference)***, pages 2919–2929, USA, 2024. [C13] (Corresponding Author) One of the 53 papers (out of 847 accepted papers) that was selected for **oral presentation.** Link.

Dhruv Makwana, Gayatri Deshmukh, Onkar Susladkar, Sparsh Mittal, and S.C. Teja. LIVENet: A novel network for real-world low-light image denoising and enhancement. In *Proceedings of IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)* ***(Core A rank conference)***, pages 5844–5853, USA, 2024. [C14] (Corresponding Author) Link.

Tushir Sahu, Vidhi Bhatt, Sparsh Mittal, R Sai Chandra Teja, and S Nagesh Kumar. SPEEDNet: Salient Pyramidal Enhancement Encoder-Decoder Network for Colonoscopy Images. In *IEEE International Symposium on Smart Electronic Systems (IEEE -iSES)*, New Delhi, India, 2024. [C15] (Corresponding Author) Link.

Divya Aggarwal, R Sai Chandra Teja, and Sparsh Mittal. A stacking ensemble technique to predict speed and distance in 4g and 5g communication datasets. In *IEEE International Symposium on Smart Electronic Systems (IEEE -iSES)*, New Delhi, India, 2024. [C16] (Corresponding Author) Link.

Vibhu, Shivang Bhargav, Vivek Kumar, and Sparsh Mittal. Machine learning based algorithm for shockley-read-hall recombination and augur recombination predictions. In *IEEE International Symposium on Smart Electronic Systems (IEEE-iSES)*, New Delhi, India, 2024. [C17] (Corresponding Author) Link.

Vishesh Mishra, Sparsh Mittal, Nirbhay Mishra, and Rekha Singhal. Security Implications of Approximation: A Study of Trojan Attacks on Approximate Adders and Multipliers. In *Proceedings of International Conference on VLSI Design (VLSID)*, pages 511–516, India, 2024. [C18] (Corresponding Author) **Best student paper award** Link.

Ananya Mantravadi, Siddharth Saini, R Sai Chandra Teja, Sparsh Mittal, Shrimay Shah, R Sri Devi, and Rekha Singhal. CLINet: A Novel Deep Learning Network for ECG Signal Classification. *Journal of Electrocardiology*, 83:41–48, 2024. (Impact Factor 1.3) [J5] (Corresponding Author) Link.

Maruthi S Inukonda, K. Prashanth Thummanapelly, Bheemarjuna Reddy Tamma, and Sparsh Mittal. TEFAR: An Efficient Transparent Finer-grained Encryption of Internet Access Artifacts. In *COMSNETS India Internet Governance Workshop (IIGW)*, 2024. [C19] **Best paper award**.

Dhruv Makwana, R Sai Chandra Teja, and Sparsh Mittal. PCBSegClassNet - A Light-weight Network for Segmentation and Classification of PCB Component. *Expert Systems With Applications* ***(Q1 journal)***, 225:120029, 2023. (Impact Factor 8.665) [J6] (Corresponding Author) Link.

Vandan Gorade, Sparsh Mittal, and Rekha Singhal. PaCL: Patient-aware Contrastive Learning Through Metadata Refinement for Generalized Early Disease Diagnosis. *Computers in Biology and Medicine* ***(Q1 journal)***, 167:107569, 2023. (Impact Factor 7.7), [J7] (Corresponding Author) Link.

Onkar Susladkar, Gayatri Deshmukh, Dhruv Makwana, Sparsh Mittal, S.C. Teja, and Rekha Singhal. GAFNet: A Global Fourier Self Attention Based Novel Network for multi-modal downstream tasks. In *Proceedings of IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)* ***(Core A rank conference)***, pages 5231–5240, Hawaii, USA, 2023. [C20] (Corresponding Author) Link.

Onkar Susladkar, Gayatri Deshmukh, S.C. Teja, Sparsh Mittal, and Rekha Singhal. LiBERTy: A Novel Model for Natural Language Understanding. In *Proceedings of ACM International Conference on AI-ML Systems (AIMLSystems)*, pages 1–9, Bengaluru, India, 2023. [C21] (Corresponding Author)**(Best paper award honorable mention)** Link.

Onkar Susladkar, Gayatri Deshmukh, Subhrajit Nag, Ananya Mantravadi, Dhruv Makwana, Sujitha Ravichandran, R Sai Chandra Teja, Gajanan H Chavhan, C Krishna Mohan, and Sparsh Mittal. ClarifyNet: A High-Pass and Low-Pass Filtering Based CNN for Single Image Dehazing. *Journal of Systems Architecture* ***(Q1 journal)***, 132:102736, 2023. (impact factor 5.836) [J8] (Corresponding Author) Link,.

Ananya Mantravadi, Dhruv Makwana, S.C. Teja, Sparsh Mittal, and Rekha Singhal. Dilated Involutional Pyramid Network (DInPNet): A Novel Model for Printed Circuit Board (PCB) Components Classification. In *Proceedings of 24th International Symposium on Quality Electronic Design (ISQED)*, California, USA, 2023. [C22] (Corresponding Author) Link.

Onkar Susladkar, Dhruv Makwana, Gayatri Deshmukh, Sparsh Mittal, S.C. Teja, and Rekha Singhal. TPFNet: A Novel Text In-painting Transformer for Text Removal. In *Proceedings of IEEE International Conference on Document Analysis and Recognition (ICDAR)* ***(Core A rank conference)***, pages 155–172, California, USA, 2023. [C23] (Corresponding Author) Link.

Mubashir A Kharadi, Sparsh Mittal, and Jhuma Saha. Structural, electronic and optical properties of fluorinated bilayer silicene. *Optical Materials* ***(Q2 journal)***, 136:113418, February 2023. (impact factor 3.754) [J9] Link.

Aabid Amin Fida, Farooq A Khanday, and Sparsh Mittal. An active memristor based rate-coded spiking neural network. *Neurocomputing* ***(Q2 journal)***, 533:61–71, 2023. (Impact Factor 5.779) (Corresponding Author)[J10] Link.

Vishu Saxena, Yash Jain, and Sparsh Mittal. Machine Learning and Polynomial Chaos models for Accurate Prediction of SET Pulse Current. In *Proceedings of IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, pages 1–6, Brazil, 2023. [C24] (Corresponding Author) Link.

Vibhu, Vivek Kumar, and Sparsh Mittal. Machine Learning-based model for Single Event Upset Current Prediction in 14nm FinFETs. In *Proceedings of IEEE International VLSI Design and Embedded Systems conference*, Hyderabad, India, 2023. [C25] (Corresponding Author) Link.

Aaditi Kapre, Shruti Kunde, Sparsh Mittal, and Rekha Singhal. RAxC: Reflexivity-based Approximate Computing techniques for efficient remote sensing. In *Proceedings of IEEE International Conference on Big Data (Core B rank conference)*, pages 1168–1173, Sorrento, Italy, 2023. [C26] Link.

Vishesh Mishra, Sparsh Mittal, Neelofar Hassan, Rekha Singhal, and Urbi Chatterjee. VADF: Versatile Approximate Data Formats for Energy-Efficient Computing. *ACM Transactions on Embedded Computing Systems (TECS) (Q3 journal)*, pages 111:1–111:21, 2023. (Impact Factor 1.89) [J11] (Corresponding Author) Link.

Jens Domke, Emil Vatai, Balazs Gerofi, Yuetsu Kodama, Mohamed Wahib, Artur Podobas, Sparsh Mittal, Miquel Pericas, Lingqi Zhang, Peng Chen, Aleksandr Drozd, and Satoshi Matsuoka. At the Locus of Performance: A Case Study in Enhancing CPUs with Copious 3D-Stacked Cache. *ACM Transactions on Architecture and Code Optimization (TACO) (Q3 journal)*, 20(4):57, 2023. (Impact Factor 1.6) [J12] Link.

Yash Khare, Kumud Lakara, Sparsh Mittal, Arvind Kaushik, and Rekha Singhal. SpotOn: A Gradient-based Targeted Data Poisoning Attack on Deep Neural Networks. In *Proceedings of 24th International Symposium on Quality Electronic Design (ISQED)*, California, USA, 2023. [C27] (Corresponding Author) Link.

K. Chitty-Venkata, Sparsh Mittal, Murali Emani, Venkatram Vishwanath, and Arun K Somani. A survey of techniques for optimizing transformer inference. *Journal of Systems Architecture* ***(Q1 journal)***, 144:102990, 2023. (impact factor 4.5) [R1] (Corresponding Author) Link.

Vishesh Mishra, Sparsh Mittal, Rekha Singhal, and Manoj Nambiar. Novel, configurable approximate floating-point multipliers for error-resilient applications. In *Proceedings of 24th International Symposium on Quality Electronic Design (ISQED)*, California, USA, 2023. [C28] (Corresponding Author) Link.

Maruthi S Inukonda, Jatin S Tarachandani, Imtiaz Ahmed, Bheemarjuna Reddy Tamma, and Sparsh Mittal. ZETA: A Zero-Trust Security based Forensic-Ready Solution for Perimeter-less Enterprise Networks. In *IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS)*, pages 189–194, India, 2023. [C29] Link.

Mubashir A Kharadi, Gul Faroz A Malik, and Sparsh Mittal. Electric field tunable spin polarization in functionalized silicene. *Physics Letters A* ***(Q2 journal)***, 429:127952, 2022. (impact factor 2.654) [J13] (Corresponding Author) Link.

Vishesh Mishra, Sparsh Mittal, Saurabh Singh, Divy Pandey, and Rekha Singhal. MEGA-MAC: A Merged Accumulation based Approximate MAC Unit for Error Resilient Applications. In *Proceedings of 32nd ACM Great Lakes Symposium on VLSI (GLSVLSI)*, page 325–328, California, USA, 2022. [C30] (Corresponding Author) Link.

Mubashir Kharadi, Gul Faroz Ahmed Malik, and Sparsh Mittal. Temperature-dependent high magnetoresistance in zigzag silicene nanoribbon heterostructure. *IEEE Transactions on Electron Devices* ***(Q2 journal)***, 69(7):4010–4015, 2022. (impact factor 2.91) [J14] Link.

Gayatri Deshmukh, Onkar Susladkar, Dhruv Makwana, R Sai Chandra Teja, S Nagesh Kumar, and Sparsh Mittal. FEEDNet: A Feature Enhanced Encoder-Decoder LSTM Network for Nuclei Segmen-

tation for Histopathological Diagnosis. *Physics in Medicine and Biology* ***(Q2 journal)***, 67(19):195011, 2022. (impact factor 4.174) [J15] (Corresponding Author) Link.

Dhruv Makwana, Subhrajit Nag, Onkar Susladkar, Gayatri Deshmukh, R Sai Chandra Teja, Sparsh Mittal, and C Krishna Mohan. ACLNet: An Attention and Clustering-based Light-weight Cloud Segmentation Network. *Remote Sensing Letters (Q3 journal)*, 13(9):865–875, 2022. (impact factor 2.583) [J16] Link.

Subhrajit Nag, Dhruv Makwana, R Sai Chandra Teja, Sparsh Mittal, and C Krishna Mohan. WaferSeg-ClassNet - A Light-weight Network for Classification and Segmentation of Semiconductor Wafer Defects. *Computers in industry* ***(Q1 journal)***, 142:103720, 2022. (impact factor 11.245) [J17] Link.

Yash Jain, Vishu Saxena, and Sparsh Mittal. Ensembling Deep Learning And CIELAB Color Space Model for Fire Detection from UAV images. In *Proceedings of International Conference on AI-ML Systems (AIML-Systems)*, pages 7:1–7:9, India, 2022. [C31] (Corresponding Author), Link.

Yash Khare, Kumud Lakara, Maruthi S Inukonda, Sparsh Mittal, Mahesh Chandra, and Arvind Kaushik. Design and Analysis of Novel Bit-flip Attacks and Defense Strategies for DNNs. In *Proceedings of 5th IEEE Conference on Dependable and Secure Computing (DSC)*, Edinburgh, UK, 2022. [C32] (Corresponding Author) Link .

Sudhir Rai, Ashish Mittal, and Sparsh Mittal. A node-embedding features based machine-learning technique for dynamic malware detection. In *Proceedings of 5th IEEE Conference on Dependable and Secure Computing (DSC)*, Edinburgh, UK, 2022. [C33] (Corresponding Author) Link.

Maruthi S Inukonda, Atharva R Karpate, Vaibhav S Chauhan, Bheemarjuna Reddy Tamma, Sparsh Mittal, and Praveen Tammana. NASCENT: A Non-invasive Solution for Detecting Utilization of Servers in Bare-metal Cloud. *IEEE Access* ***(Q2 journal)***, 10:12866–12881, 2022. (impact factor 3.367) [J18] Link.

Sparsh Mittal, Srishti Srivastava, and J Phani Jayanth. A survey of deep learning techniques for underwater image classification. *IEEE Transactions on Neural Networks and Learning Systems* ***(Q1 journal)***, 34(10):6968–6982, 2022. (impact factor 14.255) Link [R2] (Corresponding Author).

Gul Faroz A Malik, Mubashir A Kharadi, Farooq A Khanday, Khurshed A Shah, Sparsh Mittal, and Brajesh Kumar Kaushik. Dilute magnetic semiconductor electrode based magnetic tunnel junction for high temperature applications. *Physica B: Physics of Condensed Matter (Q3 journal)*, 627:413525, 2021. (impact factor 2.4) [J19] Link.

Mubashir A Kharadi, Gul Faroz A Malik, Farooq A Khanday, and Sparsh Mittal. Silicene based spin filter with high spin-polarization. *IEEE Transactions on Electron Devices* ***(Q2 journal)***, 68(10):5095–5100, 2021. (impact factor 2.91) [J20] (Corresponding Author) Link.

Mubashir A Kharadi, Gul Faroz A Malik, Feroz A Najar, Farooq A Khanday, Khurshed A Shah, and Sparsh Mittal. First Principle Study of Fluorine Functionalized Germanene based Two Probe Device. *Physica B: Physics of Condensed Matter (Q3 journal)*, 620:413249, 2021. (impact factor 2.4) [J21] Link.

Saksham Sharma, Vanshika V Bhargava, Aditya Singh, Kshitij Bhardwaj, and Sparsh Mittal. Leveraging Prediction Confidence For Versatile Optimizations to CNNs. In *Proceedings of International Conference on AI-ML Systems (AIMLSystems)*, Bengaluru, India, 2021. (Corresponding Author)[C34] Link.

Santanu Pattanayak, Subhrajit Nag, and Sparsh Mittal. CURATING: A Multi-Objective based Pruning Technique for CNNs. *Journal of Systems Architecture* ***(Q1 journal)***, 116:102031, 2021. (impact factor 3.77) [J22] (Corresponding Author) Link.

Dandpati Kumar Bhargav Achary, S.C. Teja, Sparsh Mittal, Biswabandan Panda, and C K. Mohan. Reverse Engineering Layer-profile of Deep Neural Networks using Hardware Performance Counters. In

Proceedings of International Conference on AI-ML Systems (AIMLSystems), India, India, 2021. [C35] (Corresponding Author) Link.

Arshid Nisar, Seema Dhull, Sparsh Mittal, and Brajesh Kumar Kaushik. SOT and STT Based 4-bit MRAM Cell for High-Density Memory Applications. *IEEE Transactions on Electron Devices* ***(Q2 journal)***, 68(9):4384–4390, 2021. (impact factor 2.91) [J23] Link.

Sheel Sindhu Manohar, Sparsh Mittal, and Hemangee K Kapoor. CORIDOR: exploiting Coherence and temporal Read Intensity to mitigate read disurb error in STT-RAM based LLCs. *ACM Transactions on Embedded Computing Systems (TECS) (Special issue on Memory and Storage Systems for Embedded and IoT Applications) (Q3 journal)*, 21(1), 2021. (impact factor 1.19) [J24] Link.

Arshid Nisar Laway, Seema Dhull, Brajesh K Kaushik, and Sparsh Mittal. High-Performance Voltage Controlled Multilevel MRAM Cell. *IOP Semiconductor Science and Technology (Q3 journal)*, 36(12):125013, 2021. (impact factor 2.35) [J25] Link.

Nandan Kumar Jha and Sparsh Mittal. Modeling data reuse in deep neural networks by taking datatypes into cognizance. In *IEEE Transactions on Computers* ***(Q2 journal)***, volume 70, pages 1526–1538, 2021. (impact factor 2.1) [J26] Link.

Sparsh Mittal, Himanshi Gupta, and Srishti Srivastava. A Survey on Hardware Security of DNN Models and Accelerators. *Journal of Systems Architecture* ***(Q1 journal)***, 117:102163, 2021. (impact factor 3.77) [R3] Link.

Sparsh Mittal, Gaurav Verma, Brajesh K Kaushik, and Farooq Khanday. A Survey of SRAM-based In-Memory Computing Techniques and Applications. *Journal of Systems Architecture* ***(Q1 journal)***, 119:102276, 2021. (impact factor 3.77) Link [R4] (Corresponding Author).

Sparsh Mittal and Vibhu. A survey of accelerator architectures for 3d convolution neural networks. *Journal of Systems Architecture* ***(Q1 journal)***, 115:102041, 2021. (impact factor 3.77) [R5] (Corresponding Author) Link.

Subhrajit Nag, Yash Khandelwal, Sparsh Mittal, C K. Mohan, and Alex Kai Qin. ARCN: A Real-time Attention-based Network for Crowd Counting from Drone Images. In *Proceedings of IEEE 18th India Council International Conference (INDICON)*, India, 2021. (Corresponding Author)[C36] Link.

Srishti Srivastava, Sarthak Narayan, and Sparsh Mittal. A Survey of Deep Learning Techniques for Vehicle Detection from UAV Images. *Journal of Systems Architecture* ***(Q1 journal)***, 117:102152, 2021. (impact factor 3.77) [R6] Link.

Sparsh Mittal, Poonam Rajput, and Sreenivas Subramoney. A Survey of Deep Learning on CPUs: Opportunities and Co-optimizations. *IEEE Transactions on Neural Networks and Learning Systems* ***(Q1 journal)***, 33(10):5095–5115, 2022. (impact factor 14.2) [R7] (Corresponding Author) Link.

Poonam Rajput, Subhrajit Nag, and Sparsh Mittal. Detecting Usage of Mobile Phones using Deep Learning Technique. In *Proceedings of 6th EAI International Conference on Smart Objects and Technologies for Social Good (GOODTECHS)*, pages 96–101, Belgium, 2020. [C37] (Corresponding Author) Link.

Poonam Rajput, Sparsh Mittal, and Sarthak Narayan. Improving Accuracy and Efficiency of Object Detection Algorithms using Multiscale Feature Aggregation Plugins. In *Proceedings of IAPR TC3 Workshop on Artificial Neural Networks in Pattern Recognition (ANNPR)*, pages 65–76, Winterthur, Switzerland, 2020. Springer. [C38] (Corresponding Author) Link.

R. Saini, N. Jha, B. Das, Sparsh Mittal, and C. Mohan. ULSAM: Ultra-Lightweight Subspace Attention Module for Compact Convolutional Neural Networks. *Proceedings of Winter Conference on Applications of Computer Vision (WACV)* ***(Core A rank conference)***, pages 1616–1625, 2020. [C39] (Corresponding Author) Link .

Nandan Kumar Jha, Sparsh Mittal, Binod Kumar, and G. Mattela. DeepPeep: Exploiting Design Ramifications to Decipher the Architecture of Compact DNNs. In *ACM Journal on Emerging Technologies in Computing Systems (Q3 journal)*, volume 17, pages 5:1–5:25, 2020. (impact factor 1.65) [J27] Link.

Nandan Kumar Jha, Shreyas Ravishankar, Sparsh Mittal, Arvind Kaushik, Dipan Mandal, and Mahesh Chandra. DRACO: Co-Optimizing Hardware Utilization, and Performance of DNNs on Systolic Accelerator. In *Proceedings of IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, pages 574–579, Greece, 2020. [C40] (Corresponding Author) Link.

N. Jha, R. Saini, S. Nag, and Sparsh Mittal. E2GC: Energy-efficient Group Convolution in Deep Neural Networks. *Proceedings of IEEE International Conference on VLSI Design (VLSID)*, pages 155–160, 2020. [C41] (Corresponding Author) Link, .

Sparsh Mittal. A Survey on Modeling and Improving Reliability of DNN Algorithms and Accelerators. *Journal of Systems Architecture* ***(Q1 journal)***, 104:101689, 2020. (impact factor 2.55) [R8] Link.

N. Jha, Sparsh Mittal, and G. Mattela. The ramifications of making deep neural networks compact. In *Proceedings of IEEE International Conference on VLSI Design*, pages 215–220, India, 2019. [C42] (Corresponding Author) Link.

Haonan Wang, Mohamed Ibrahim, Sparsh Mittal, and A. Jog. Address-Stride Assisted Approximate Load Value Prediction in GPUs. In *Proceedings of ACM International Conference on Supercomputing (ICS)* ***(Core A rank conference)***, page 184–194, Arizona, USA, 2019. [C43] Link.

Sparsh Mittal. A Survey on Optimized Implementation of Deep Learning Models on the NVIDIA Jetson Platform. *Journal of Systems Architecture* ***(Q1 journal)***, 97:428–442, 2019. (impact factor 1.16) [R9] Link.

Sparsh Mittal and Shraiysh Vaishay. A Survey of Techniques for Optimizing Deep Learning on GPUs. *Journal of Systems Architecture* ***(Q1 journal)***, 99:101635, 2019. (impact factor 1.16) [R10] Link.

Sumanth Umesh and Sparsh Mittal. A survey of spintronic architectures for processing-in-memory and neural networks. *Journal of Systems Architecture* ***(Q1 journal)***, 97:349–372, 2019. (impact factor 0.91) [R11] Link.

Sparsh Mittal and Subhrajit Nag. A survey of encoding techniques for reducing data-movement energy. *Journal of Systems Architecture* ***(Q1 journal)***, 97:373–396, 2019. (impact factor 0.91) [R12] Link.

Sparsh Mittal and Maruthi S Inukonda. A survey of techniques for improving error-resilience of dram. *Journal of Systems Architecture* ***(Q1 journal)***, 91:11–40, 2018. (impact factor 0.91) [R13] Link.

Sparsh Mittal, Rajendra Bishnoi, Fabian Oboril, Haonan Wang, Mehdi Tahoori, A. Jog, and Jeffrey Vetter. Architecting SOT-RAM Based GPU Register File. In *Proceedings of IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, Germany, 2017. [C44] (Corresponding Author) Link.

Rujia Wang, Sparsh Mittal, Youtao Zhang, and Jun Yang. Decongest: Accelerating Super-Dense PCM under Write Disturbance by Hot Page Remapping. *IEEE Computer Architecture Letters (Q3 journal)*, 16(2):107–110, 2017. Mittal and Wang are co first-authors. (Impact Factor: 1.14) [J28] Link.

Lei Jiang, Sparsh Mittal, and Wujie Wen. Building a Fast and Power Efficient Inductive Charge Pump System for 3D Stacked Phase Change Memories. In *Proceedings of ACM Great Lakes Symposium on VLSI (GLSVLSI), Canada*, page 275–280, Canada, 2017. [C45] Link.

Sparsh Mittal, J. Vetter, and L. Jiang. Addressing Read-disturbance Issue in STT-RAM by Data Compression and Selective Duplication. *IEEE Computer Architecture Letters (Q3 journal)*, 16(2):94–98, 2017. (Impact Factor: 1.14) [J29] Link.

Sparsh Mittal, Haonan Wang, A. Jog, and Jeffrey Vetter. Design and Analysis of Soft-Error Resilience Mechanisms for GPU Register File. In *Proceedings of IEEE International Conference on VLSI Design (VLSID)*, pages 409–414, India, 2017. [C46] (Corresponding Author) Link.

Sparsh Mittal, R. Wang, and J. Vetter. DESTINY: A Comprehensive Tool with 3D and Multi-Level Cell Memory Modeling Capability. In *Journal of Low Power Electronics and Applications (JLPEA)*, volume 7, 2017. Link [J30] (Corresponding Author).

Guoliang Zhu, Kai Lu, Xiaoping Wang, Yiming Zhang, Pengfei Zhang, and Sparsh Mittal. SwapX: An NVM-based hierarchical swapping framework. In *IEEE Access* ***(Q2 journal)***, volume 5, pages 16383–16392, 2017. (Impact Factor: 3.244) [J31] Link.

Sparsh Mittal. A Survey Of Techniques for Approximate Computing. *ACM Computing Surveys* ***(Q1 journal)***, 48(4), 2016. (impact factor 6.13) [R14] Link.

Sparsh Mittal and J. Vetter. EqualWrites: Reducing Intra-set Write Variations for Enhancing Lifetime of Non-volatile Caches . *IEEE Transactions on VLSI Systems* ***(Q2 journal)***, 24(1):103–114, 2016. (impact factor 1.14) [J32] Link.

Sparsh Mittal and J. Vetter. Reducing Soft-error Vulnerability of Caches using Data Compression. In *Proceedings of ACM Great Lakes Symposium on VLSI (GLSVLSI), USA*, pages 197–202, 2016. [C47] Link.

Panruo Wu, Dong Li, Zizhong Chen, Jeffrey Vetter, and Sparsh Mittal. Algorithm-directed data placement in hybrid memory. In *Proceedings of ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC),* ***(Core A rank conference)***, page 141–152, Japan, 2016. [C48] Link.

M. Poremba, Sparsh Mittal, Dong Li, J. Vetter, and Yuan Xie. DESTINY: A Tool for Modeling Emerging 3D NVM and eDRAM caches. In *Proceedings of Design Automation and Test in Europe (DATE) (Core B rank conference)*, pages 1543–1546, France, 2015. (M. Poremba and S. Mittal are co first-authors) [C49] (Corresponding Author) Link.

Li Yu, Dong Li, Sparsh Mittal, and J. Vetter. Quantitatively modeling application resiliency with the data vulnerability factor. In *Proceedings of ACM/IEEE International Conference for High Performance Computing, Networking, Storage, and Analysis (SC)* ***(Core A rank conference)***, pages 695–706, USA, 2014. **best student paper finalist** [C50] Link.

Mubashir A Kharadi, Gul Faroz A Malik, Farooq A Khanday, Khurshed A Shah, Sparsh Mittal, and Brajesh K Kaushik. Review-silicene: From material to device applications. *ECS Journal of Solid State Science and Technology*, 9(11):115031, 2020. (impact factor 2.14) [R15] Link.

Sparsh Mittal and Sumanth Umesh. A Survey on Hardware Accelerators and Optimization Techniques for RNNs. *Journal of Systems Architecture* ***(Q1 journal)***, 112:101839, 2021. (impact factor 3.77) [R16] Link.

Sparsh Mittal. A Survey of FPGA-based Accelerators for Convolutional Neural Networks. *Neural computing and applications* ***(Q2 journal)***, 32:1109–1139, 2018. (impact factor 4.77) [R17] Link.

Nivedita Shrivastava, Muhammad Abdullah Hanif, Sparsh Mittal, Smruti Ranjan Sarangi, and Muhammad Shafique. A survey of hardware architectures for generative adversarial networks. *Journal of Systems Architecture* ***(Q1 journal)****(Sparsh, Abdullah and Nivedita are co-first authors)*, 118:102227, 2021. (impact factor 3.77) Link [R18] (Corresponding Author).

Sparsh Mittal. A Survey on Evaluating and Optimizing Performance of Intel Xeon Phi. *Concurrency and Computation: Practice and Experience (Q3 journal)*, 32(19):e5742, October 2020. (impact factor 1.16) [R19] Link.

Sumanth Umesh and Sparsh Mittal. A survey of techniques for intermittent computing. *Journal of Systems Architecture* ***(Q1 journal)***, 112:101859, January 2021. (impact factor 3.77) [R20] Link.

Sparsh Mittal. A Survey of Techniques for Cache Partitioning in Multicore Processors. *ACM Computing Surveys* ***(Q1 journal)***, 50(2), 2017. (impact factor 6.13) [R21] Link.

Sparsh Mittal. A survey of value prediction techniques for leveraging value locality. *Concurrency and Computation: Practice and Experience (Q3 journal)*, 29:e4250, 2017. (impact factor 1.13) [R22] Link.

Sparsh Mittal. A Survey of Soft-Error Mitigation Techniques for Non-Volatile Memories. *Computers*, 6(8), 2017. [R23] Link.

Sparsh Mittal. A Survey on Applications and Architectural-optimizations of Micron's Automata Processor. *Journal of Systems Architecture* ***(Q1 journal)***, 98:135–164, 2019. (impact factor 1.16) [R24] Link.

Sparsh Mittal and Venkat Mattela. A survey of techniques for improving efficiency of mobile web browsing. *Concurrency and Computation Practice and Experience (Q3 journal)*, 31:e5126, 2019. (impact factor 1.11) [R25] Link.

Ahmed I Alsalibi, Sparsh Mittal, M. A. Al-betar, and P. Sumari. A Survey of Techniques for Architecting SLC/MLC/TLC Hybrid Flash Memory based SSDs. *Concurrency and Computation Practice and Experience (Q3 journal)*, 30:e4420, 2018. (impact factor 1.13) [R26] Link.

Sparsh Mittal and Ahmed Alsalibi. A survey of techniques for improving security of non-volatile memories. *Journal of Hardware and Systems Security*, 2(2):179–200, 2018. [R27] Link.

Sparsh Mittal. A survey of techniques for dynamic branch prediction. *Concurrency and Computation: Practice and Experience (Q3 journal)*, 31:e4666, 2019. (impact factor 1.13) [R28] Link.

Sparsh Mittal. A survey of reram-based architectures for processing-in-memory and neural networks. *Machine learning and knowledge extraction*, 1:5, 2018. [R29] Link.

Sparsh Mittal, S B Abhinaya, Manish Reddy, and Irfan Ali. A Survey of Techniques for Improving Security of GPUs. *Hardware and Systems Security Journal*, 2:266–285, 2018. [R30] Link.

Sparsh Mittal. A Survey of Techniques for Architecting TLBs. *Concurrency and Computation: Practice and Experience (Q3 journal)*, 29:e4061, 2017. (impact factor 0.942) [R31] Link.

Sparsh Mittal. A Survey of Recent Prefetching Techniques for Processor Caches. *ACM Computing Surveys* ***(Q1 journal)***, 49(2), 2016. (impact factor 6.13) [R32] Link.

Sparsh Mittal and Jeffrey Vetter. Reliability Tradeoffs in Design of Volatile and Non-volatile Caches. *Journal of Circuits, Systems, and Computers*, 25(11):1650139, 2016. (Impact Factor: 0.25) [J33] Link.

Sparsh Mittal. A Survey of Techniques for Architecting and Managing GPU Register File. *IEEE Transactions on Parallel and Distributed Systems (TPDS)* ***(Q1 journal)***, 28(1):16–28, 2017. (impact factor 3.40) [R33] Link.

Sparsh Mittal and Jeffrey Vetter. A Survey of CPU-GPU Heterogeneous Computing Techniques. *ACM Computing Surveys* ***(Q1 journal)***, 47(4):69:1–69:35, 2015. (impact factor 6.13) [R34] Link.

Sparsh Mittal. A Survey of Techniques for Designing and Managing CPU Register File. *Concurrency and Computation: Practice and Experience (Q3 journal)*, 29:e3906, 2017. (impact factor 1.167) [R35] Link.

Sparsh Mittal and Jeffrey Vetter. AYUSH: Extending Lifetime of SRAM-NVM Way-based Hybrid Caches Using Wear-leveling. In *Proceedings of IEEE International Symposium on Modeling, Analysis, and Simulation On Computer and Telecommunication Systems (MASCOTS)*, pages 112–121, USA, 2015. [C51] Link.

Sparsh Mittal. A Survey of Techniques for Architecting Processor Components using Domain Wall Memory. *ACM Journal on Emerging Technologies in Computing Systems (Q3 journal)*, 13(2), 2016. (impact factor 0.705) [R36] Link.

Sparsh Mittal and J. Vetter. AYUSH: A Technique for Extending Lifetime of SRAM-NVM Hybrid Caches. *IEEE Computer Architecture Letters (CAL)*, 14(2):115–118, 2015. (impact factor 1.14) [J34] Link.

Sparsh Mittal. A Survey Of Architectural Techniques for Managing Process Variation. *ACM Computing Surveys* ***(Q1 journal)***, 48(4):54:1–54:29, January 2016. (impact factor 6.13) Link [R37] .

Sparsh Mittal, Jeffrey Vetter, and Dong Li. Improving energy efficiency of Embedded DRAM Caches for High-end Computing Systems. In *Proceedings of ACM High Performance Distributed Computing (HPDC),* ***(Core A rank conference)***, page 99–110, Canada, 2014. [C52] Link.

Sparsh Mittal and J. Vetter. EqualChance: Addressing Intra-set Write Variation to Increase Lifetime of Non-volatile Caches. In *USENIX Workshop on Interactions of NVM/Flash with Operating Systems and Workloads (INFLOW)*, 2014. [C53] Link.

Sparsh Mittal. A Survey Of Techniques for Architecting and Managing Asymmetric Multicore Processors. *ACM Computing Surveys* ***(Q1 journal)***, 48(3):45:1–45:38, January 2016. (impact factor 6.13) Link [R38] .

Sparsh Mittal. A Survey Of Techniques for Cache Locking. *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, 21(3):49:1–49:24, 2016. (impact factor 0.69) [R39] .

Sparsh Mittal, Jeffrey Vetter, and Dong Li. LastingNVCache: A Technique for Improving the Lifetime of Non-volatile Caches. In *Proceedings of IEEE Symposium on VLSI (ISVLSI)*, pages 534–540, USA, 2014. [C54] (Corresponding Author) Link.

Sparsh Mittal et al. WriteSmoothing: Improving Lifetime of Non-volatile Caches Using Intra-set Wear-leveling. In *Proceedings of ACM Great Lakes Symposium on VLSI (GLSVLSI)*, page 139–144, USA, 2014. [C55] Link.

Sparsh Mittal. A Survey Of Architectural Techniques for Near-Threshold Computing . *ACM Journal on Emerging Technologies in Computing Systems*, 12(4):46:1–46:26, December 2015. (impact factor 0.73) Link [R40] .

Sparsh Mittal. A Survey Of Cache Bypassing Techniques. *Journal of Low Power Electronics and Applications*, 2016. [R41] Link.

Sparsh Mittal and Jeffrey Vetter. A Technique For Improving Lifetime of Non-volatile Caches using Write-minimization. *Journal of Low Power Electronics and Applications*, 6(1), January 2016. [J35] Link.

Sparsh Mittal and Jeffrey Vetter. A Survey of Methods for Analyzing and Improving GPU Energy Efficiency. *ACM Computing Surveys* ***(Q1 journal)***, 26(6):1524–1537, 2015. (impact factor 6.13) Link [R42] .

Sparsh Mittal and Jeffrey Vetter. A Survey of Software Techniques for Using Non-Volatile Memories for Storage and Main Memory Systems. *IEEE Transactions on Parallel and Distributed Systems (TPDS)* ***(Q1 journal)***, 27(5):1537–1550, 2016. (impact factor 3.40) [R43] Link.

J. Vetter and Sparsh Mittal. Opportunities for nonvolatile memory systems in extreme-scale high performance computing. *Computing in Science and Engineering (Q3 journal)*, 17(2):73–82, 2015. (impact factor 1.25) [R44] Link.

Sparsh Mittal and Jeffrey Vetter. A Survey Of Techniques for Architecting DRAM Caches. *IEEE Transactions on Parallel and Distributed Systems (TPDS)* ***(Q1 journal)***, 27(6):1852–1863, 2016. (impact factor 3.40) Link [R45] .

Sparsh Mittal and Jeffrey Vetter. A Survey Of Architectural Approaches for Data Compression in Cache and Main Memory Systems. *IEEE Transactions on Parallel and Distributed Systems (TPDS)* ***(Q1 journal)***, 27(5):1524–1536, 2016. (impact factor 3.40) [R46] Link.

Sparsh Mittal, Jeffrey S Vetter, and Dong Li. A Survey Of Architectural Approaches for Managing Embedded DRAM and Non-volatile On-chip Caches. *IEEE Transactions on Parallel and Distributed Systems (TPDS)* ***(Q1 journal)***, 2014. (impact factor 3.40) [R47] Link.

Sparsh Mittal et al. FlexiWay: A Cache Energy Saving Technique Using Fine-grained Cache Reconfiguration. In *Proceedings of International Conference on Computer Design (ICCD)*, pages 100–107, USA, 2013. [C56] Link.

Sparsh Mittal and Jeffrey Vetter. A Survey of Techniques for Modeling and Improving Reliability of Computing Systems. *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 27(4):1226– 1238, 2016. (impact factor 3.40) [R48] Link.

Sparsh Mittal, Yanan Cao, and Zhao Zhang. MASTER : A Multicore Cache Energy Saving Technique Using Dynamic Cache Reconfiguration. *IEEE Transactions on VLSI Systems* ***(Q2 journal)***, 22(8):1653 – 1665, 2014. (impact factor 1.14) [J36] Link.

Sparsh Mittal. A Survey of Power Management Techniques for Phase Change Memory. *International Journal of Computer Aided Engineering and Technology (IJCAET)*, 2014. [R49] .

Sparsh Mittal and Zhao Zhang. EnCache: A Dynamic Profiling Based Reconfiguration Technique for Improving Cache Energy Efficiency. *Journal of Circuits, Systems, and Computers*, 23(10), 2014. (impact factor 0.33) [J37] Link.

Sparsh Mittal. A Survey Of Techniques for Managing and Leveraging Caches in GPUs. *Journal of Circuits, Systems, and Computers (JCSC)*, 23(8), 2014. (impact factor 0.33) [R50] Link.

Sparsh Mittal. A Survey of Techniques For Improving Energy Efficiency in Embedded Computing Systems. *International Journal of Computer Aided Engineering and Technology (IJCAET)*, 6(4):440–459, 2014. Link [R51] .

Sparsh Mittal. A Study of Successive Over-relaxation Method Parallelization Over Modern HPC Languages. *Intl. Journal of High Performance Computing and Networking*, 7(4):292–298, 2014. [J38] Link.

Sparsh Mittal. A Survey of Architectural Techniques For Improving Cache Power Efficiency. *Elsevier Sustainable Computing: Informatics and Systems* ***(Q1 journal)***, 4(1):33–43, 2014. [R52] Link.

Sparsh Mittal. A Survey of Architectural Techniques For DRAM Power Management. *International Journal of High Performance Systems Architecture*, 4(2):110–119, 2012. Link [R53] .

Sparsh Mittal, Zhao Zhang, and Yanan Cao. CASHIER: A Cache Energy Saving Technique for QoS Systems. *Proceedings of 26th International Conference on VLSI Design (VLSID)*, pages 43–48, 2013. [C57] (Corresponding Author) Link.

Sparsh Mittal and Zhao Zhang. Integrating Sampling Approach with Full System Simulation: Bringing Together the Best of Both. In *IEEE International Conference On Electro/Information Technology*, USA, 2012. [C58] .

Sparsh Mittal and Zhao Zhang. EnCache: Improving Cache Energy Efficiency Using A Software-Controlled Profiling Cache. In *IEEE International Conference On Electro/Information Technology (EIT)*, USA, 2012. [C59] .

Initiatives taken and contributions at IITR

My most unique contribution at IITR has been to push the idea of starting a center for offering

degree programs on AI and DS. I did the discussion work for this with multiple HODs and director (Prof Chaturvedi). Due to above, I was made the convener of committee formed for initiating artificial intelligence (AI) and Data Science (DS) degree programs. This committee set the ground for creation of the Center for AI/DS (CAIDS) and offering MTech programs in AI/DS.

Later, I was also involved in getting the financial support of Mehta Family for this center and then, this center was renamed to Mehta Family School of DS and AI (MFSDSAI).

I was involved in developing the curriculum of BTech in DS/AI degree offered by MFSDSAI. Right in its first year, this program has attracted top JEE rankers (500). Also, among the DS/AI BTech degrees offered by 8 IITs, our BTech program has attracted the topmost JEE rankers.

I played a major role in developing the proposal for "MTech in VLSI for working professionals" in ECE department, which has been approved by senate in Feb 2021. **This is the first-of-its-kind program in IIT Roorkee.**

Proposed the idea of making department-level profiles on Linkedin for publicity/announcements. This idea was shared with all the departments by the director.

Initiated development of online room-booking system for ECE building

Administrative responsibilities at IITR

TA allocation incharge, where I implemented director's idea of doing TA allocation at department level. This has helped especially new faculty, and this is done probably first time in IIT Roorkee.

Member of ECE DAPC and institute ethics committee. Member of computer center faculty-advisory committee and purchase committee. Convener of faculty-search committee at ECE and MFSDSAI

I was in-charge for converting a room in ECE building to the department server room

Student-guiding and awards/honors to my students

PhD students at IITR: Priyanshu Tyagi, Cheena Singhal, Aabid Amin Fida, Sonali Gangwar, Harsh Raj Thakur

MTech students: Sagar, Divyansh, Soikat Das, Karunakar Reddy

PhD Alumni: Subhrajit Nag, Maruthi S. Inukonda

MTech Alumni: Dinesh Buswala, Rajat Saini, Poonam Rajput, Nandan Jha, Satanu Pattanayak, Srinivas Reddy, Pankaj Berule, Vibhu, Priyansh Singh, Krishna Chaitanya, Prahlad, Dhayan Dhananjaya Senanayake, Vipul Agrawal, Ankit Rathore, Vipin Jayprakash, Ajay Joseph, Aryan Sharma.

Awards to my students: Kumud Lakara (UG intern in our lab) was selected as one among the 9 interns selected as the best by the SPARK committee (IIT Roorkee) in year 2021. Subhrajit selected for IITH-Swinburne joint PhD program.

Courses Taught

Executive Courses: Accelerators for Deep Learning (Cloudx), Accelerators for AI (Coursera), Computer Architecture for AI (short-term course to Qualcomm), RISC-V Assembly Language Programming (short-term course to Qualcomm), etc.

Computer architecture (2016 to 2024) (largest class strength: 164)

Digital Logic (2023 to 2024)

Hardware architectures for deep learning 2019, 2021, 2023 (class strength: 70)

Advanced Computer Architecture (2017-2018) (largest class strength: 55)

Advanced memory system architecture (2016) (class strength: 12)

Shared teaching: Computer vision, Scaling to Big Data, Operating system, Computers and network security

Professional Activity and Outreach

I was an associate editor of Elsevier's Journal of Systems Architecture for 2+ years.

Organized an online SPARC workshop on "Spintronic Devices and Hardware Security" in Feb 2025, along with Prof Tanmoy Pramanik. We had 3 speakers from abroad and 4 from different IITs in India.

Organized a SPARC workshop at IITR on "Spintronic Devices" in December 2024, along with Prof Tanmoy Pramanik. Speakers: Prof Prem (NTU) and Prof P.K. Muduli (IIT Delhi).

Articles in popular media: Brain drain to Brain gain (Eduvoice), Importance of Coding (BusinessWorld).

My research has featured on Hindu businessline Phys.org, TheMemoryGuy, ScientificComputing, TechEnablement, InsideHPC (1, 2, 3, 4, 5, 6, 7,) Primeur Magazine, StorageSearch (1, 2, 3), HPCWire (1, 2,3, 4, 5), TechDecoded Data-Compression.info, and ReRAM Forum technical websites

Reviewed proposals for three European research-funding agencies (France, Switzerland and Austria).

TPC member of: VLSID 2020, IPDPS 2022, ICPP 2022, NAS 2022, SC 2023, WACV 2024, CCGrid 2024, HiPC 2024, Cluster 2024 and 2025, SC 2024, ISC 2025, IEEE ICEE 2025. Track chair in the iSES 2024 conference and VLSID 2025 and 2026 conferences.

Reviewed MS or PhD thesis of students from IIT Kanpur, IIT Madras and IIIT Hyderabad.

Acted as judge in the startup expo 2022, Smart Indian Hackathon 2022, Defence India Startup Challenges Disc X 2024.

Reviewer for ACM: Computing Surveys, TACO, JETC. IEEE: Trans. on AI, CAL, Trans. on VLSI, Intelligent Systems, ISVLSI, ICCV, Trans. on Image Processing, JETCAS, Trans. on Computers (TC), TCAD, HiPC student research symposium. Elsevier: SUSCOM. Springer: Cluster Computing, J. of Supercomputing

Gave lectures in the workshops held by TEQIP and TLC (teaching learning center) at IIT Hyderabad.

My talks on research-paper writing and presentations have been attended by 1000+ people.

Taught in computer architecture winter school organized by National Supercomputing mission.

Taught in NCERT-IITR Nurturance Programme for National Talent Search (NTS) Awardees 2022.

Guided students under Ishan Vikas Programme initiated by MHRD (Govt of India).