SANJALI YADAV

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EDUCATION

University of Maryland, College Park	May 2027 (expected)
Ph.D., Computer Science	GPA: 4.00 / 4.00
University of Maryland, College Park	Dec. 2023
M.S., Computer Science	GPA: 4.00 / 4.00
University of Maryland, College Park	Dec. 2022
B.S., Computer Science	GPA: 3.94 / 4.00

RESEARCH EXPERIENCE

Computer Architecture Systems Lab, UMD   College Park, MD
Graduate Research Assistant | Advisor: Dr. Bahar Asgari   Jan 2024 – Present
- My research focuses on developing and applying machine learning techniques to optimize sparse accelerator systems, which are crucial for modern computing applications such as large language models and graph analytics. I aim to leverage machine learning to enhance throughput, reduce latency, and improve resource utilization in hardware systems running these workloads.

Maryland Information and Network Dynamics Lab, UMD   College Park, MD
Undergraduate Research Assistant | Advisor: Dr. Ashok Agarwala   Dec. 2019 - Dec. 2022
- Developed interactive tools to support smart building maintenance, including a JavaScript-based web application visualizing data from 10,000+ energy sensors in UMD's Iribe building, and an iOS Augmented Reality app using Unity and ArcGIS to scan rooms and display real-time sensor locations and energy patterns.

Gemstone Honors College, UMD   College Park, MD
Undergraduate Research Program | Advisor: Rick Blanton   Dec. 2019 - May 2023
- Completed a four-year thesis-driven research project focused on optimizing piezoelectric energy harvesting for urban environments. Investigated how cantilever beam geometry affects power output from footstep-like impulses, finding that convex profiles improved energy efficiency by up to 24% over standard shapes. This work culminated in a co-authored honors thesis under the Gemstone Program.

PUBLICATIONS

Misam: Machine Learning–Assisted Dataflow Selection in Accelerators for Sparse Matrix Multiplication
Sanjali Yadav, Amirmahdi Namjoo, Bahar Asgari
Accepted at ACM International Symposium on Microarchitecture 2025
- Developed a machine learning-based framework that dynamically selects the optimal dataflow scheme for sparse matrix-matrix multiplication (SpGEMM) on reconfigurable hardware. Misam integrates decision trees to significantly outperform static scheduling techniques, improving performance across diverse sparsity patterns with up to $33\times$ speedup on FPGA-based systems.

Boötes: Boosting the Efficiency of Sparse Accelerators Using Spectral Clustering
Sanjali Yadav, Bahar Asgari
Accepted at ACM International Symposium on Microarchitecture, 2025
- Introduced Boötes, a spectral clustering–based technique for intelligent row reordering in SpGEMM. This approach reduces off-chip memory traffic by up to $2.3\times$ and accelerates preprocessing by $11.6\times$ on state-of-the-art accelerators, significantly improving memory locality and overall system throughput.

DynaFlow: An ML Framework for Dynamic Dataflow Selection in SpGEMM Accelerators
Sanjali Yadav, Bahar Asgari
Accepted at IEEE Computer Architecture Letters Journal, 2025
- Proposed DynaFlow, a machine learning framework that predicts the optimal SpGEMM dataflow based on input sparsity characteristics. Using both decision tree and deep reinforcement learning models, DynaFlow delivers up to 50× speedup compared to static dataflow strategies, and achieves 88% prediction accuracy on complex, real-world sparse matrices.

WORK EXPERIENCE

Capital One   Mclean, VA
Software Engineering Intern   June 2024 – Aug. 2024
- Developed a full-stack application for Capital One, automating data registration with a Python Flask backend and Angular frontend, ensuring seamless integration.
- Conducted end-to-end testing and led UI/UX design, iterating based on user feedback to enhance usability and alignment with business needs.

Capital One   Mclean, VA
Software Engineering Intern   June 2023 – Aug. 2023
- Designed and built a data pipeline using AWS SNS, Glue, Dynamo DB and Lambda to send 1.5M email messages a year to Capital One credit card customers consolidating their travel itinerary.
- Developed an ML model in the pipeline to predict flight delays with accuracy of 99% and market flight disruption assistance package to ease customer's travel experience.

Amazon   Seattle, Washington
Software Development Intern   May 2022 – Aug. 2022
- Built Cashback Abuse Prevention System (CAPS) in Java and JavaScript to automate the process of identifying 20M bad actors per year, who create multiple accounts on Amazon to abuse cashback promotions and exclude these actors from promotion campaigns.
- Completed end-to-end testing to production and worked with several AWS services like Lambda, AWS AppConfig, DynamoDB, Amazon EventBridge and Elasticsearch to develop the system.

Amazon   Seattle, Washington
Software Development Intern   June 2021 – Aug. 2021
- Analyzed the operation excellence practices at Amazon and added two new features to an internal tool using Java and JavaScript, capturing two key operational excellence metrics for 400+ teams across Amazon and saved 3 hours per week for engineers.

AWARDS
- First Place at ACM Student Research Competition (SRC) held at MICRO 2024
- Capital One Bank Dean's Scholarship Fund in Computer Science
- State of Maryland Governor's Award for Academic Excellence

SERVICES
- Artifact Evaluation Committee Member MICRO 2025
- Artifact Evaluation Committee Member ISCA 2025

SKILLS

Java, Python, C, C++, CUDA, OpenMP, Angular, C#, JavaScript, R, Ruby, Ocaml, Rust, SQL, Scala, PyTorch, Spark ML, Spring, Frontend development, Backend development, HLS tools, FPGA Programing