Md Sahil Hassan

Department of Electrical and Computer Engineering

University of Arizona

P.O. Box 210104

Tucson, AZ 85721-0104

Email: sahilhassan@arizona.edu

EDUCATION

Doctor of Philosophy Aug. 2018 – May 2024
Electrical and Computer Engineering
University of Arizona, Tucson, AZ

Dissertation: "An Emulation Framework for Exploring Domain-Specific SoCs in the Trade Space of Hardware Configuration, Resource Management and Workload Composition"

Advisor: Ali Akoglu

Master of Science Nov. 2016 – Jul. 2018
Electrical and Computer Engineering
University of Dhaka, Bangladesh

Thesis: "Design and implementation of FPGA-based AES encryption-decryption algorithm"

Advisor: Mosabber Uddin Ahmed

Bachelor of Science Jan. 2012 – Sep. 2016
Electrical and Electronic Engineering
University of Dhaka, Bangladesh

EMPLOYMENT

Postdoctoral Research Associate May 2024 – Present
Electrical and Computer Engineering
University of Arizona, Tucson, AZ

Research Assistant Jan. 2020 – May 2024
Electrical and Computer Engineering
University of Arizona, Tucson, AZ

Image Processing Intern May 2019 – Aug. 2019
Teledyne Photometrics
Tucson, AZ

Teaching Assistant Aug. 2018 – Dec. 2019
Electrical and Computer Engineering
University of Arizona, Tucson, AZ

SERVICE/OUTREACH

Editorial
Guest Editor Forthcoming,
Special Issue on Heterogeneous Computing: Architectures, Expected Dec. 2025
Systems, and Software Innovations, Parallel Computing,
Elsevier

Technical Program Committee 2025
34th Heterogeneous Computing Workshop,
IEEE International Parallel & Distributed Processing Symposium
- Recipient of Top Reviewer Recognition

Artifact Evaluator 2025
33rd International Symposium on Field-Programmable Gate Arrays (ISFPGA)

Artifact Evaluation 2025
International Conference on Compilers, Architectures, and Synthesis for Embedded Systems (CASES)
Embedded Systems Week (ESWEEK)

Referee 2023
Redefining Scalability for Diversely Heterogeneous Architectures (RSDHA) Workshop, Supercomputing (SC)

PUBLICATIONS

Journals

[J1] **Sahil Hassan**, Parker Dattilo, and Ali Akoglu, "A novel implementation methodology for error correction codes on a neuromorphic architecture," *IEEE Trans. on Computer-Aided Design of Integrated Circuits and Systems*, vol. 42, no. 12, pp. 4706–4720, 2023.

[J2] A Alper Goksoy, **Sahil Hassan**, Anish Krishnakumar, Radu Marculescu, Ali Akoglu, and Umit Y Ogras, "Theoretical Validation and Hardware Implementation of Dynamic Adaptive Scheduling for Heterogeneous Systems on Chip," *Journal of Low Power Electronics and Applications*, vol. 13, no. 4: 56, 2024.

[J3] Anish Krishnakumar, Hanguang Yu, Tutu Ajayi, A Alper Goksoy, Vishrut Pandey, Joshua Mack, **Sahil Hassan**, Kuan-Yu Chen, Chaitali Chakrabarti, Daniel W Bliss, and others, "FALCON: An FPGA emulation platform for domain-specific SoCs (DSSoCs)," *IEEE Design & Test*, vol. 41, no. 1, pp. 70–80, 2023.

[J4] Genoveva Vargas-Solar, **Md Sahil Hassan**, and Ali Akoglu, "JITA4DS: disaggregated execution of data science pipelines between the edge and the data centre," *Journal of Web Engineering*, vol. 21, no. 1, pp. 1–26, 2022.

[J5] A Alper Goksoy, Anish Krishnakumar, **Md Sahil Hassan**, Allen J Farcas, Ali Akoglu, Radu Marculescu, and Umit Y Ogras, "DAS: Dynamic adaptive scheduling for energy-efficient heterogeneous SoCs," *IEEE Embed. Sys. Lett.*, vol. 14, no. 1, pp. 51–54, 2021.

[J6] Joshua Mack, **Sahil Hassan**, Nirmal Kumbhare, Miguel Castro Gonzalez, and Ali Akoglu, "CEDR: A Compiler-integrated, Extensible DSSoC Runtime". *ACM Transactions on Embedded Computing Systems*, vol.22, no. 2, pp. 1–34, 2023.

[J7] Joshua Mack, Ruben Purdy, Kris Rockowitz, Michael Inouye, Edward Richter, Spencer Valancius, Nirmal Kumbhare, **Md Sahil Hassan**, Kaitlin Fair, John Mixter, and others, "RANC: Reconfigurable architecture for neuromorphic computing," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol.40, no. 11, pp. 2265–2278, 2020.

<u>Conferences</u>

[C1] Serhan Gener, **Sahil Hassan**, Liangliang Chang, Chaitali Chakrabarti, Tsung-Wei Huang, Umit Ogras, and Ali Akoglu, "A Unified Portable and Programmable Framework for Task-Based Execution and Dynamic Resource Management on Heterogeneous Systems," In *Proceedings of the 2025 4th International Workshop on Extreme Heterogeneity Solutions*, pp. 1–9, 2025.

[C2] **Sahil Hassan**, Michael Inouye, Miguel C Gonzalez, Ilkin Aliyev, Joshua Mack, Maisha Hafiz, and Ali Akoglu, "GPU-RANC: A CUDA Accelerated Simulation Framework for Neuromorphic Architectures," In *2024 Neuro Inspired Computational Elements Conference (NICE)*, IEEE, pp. 1–7, 2024.

[C3] Joshua Mack, Serhan Gener, **Sahil Hassan**, H Umut Suluhan, and Ali Akoglu, "CEDR-API: Productive, Performant Programming of Domain-Specific Embedded Systems," In *2023 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, pp. 16-25,2023.

[C4] Serhan Gener, **Sahil Hassan**, and Ali Akoglu, "Value-Based Resource Management at SoC Scale," In *Proc. of the SC'23 Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis*, pp. 1642–1650, 2023.

[C5] Ismet Dagli, Andrew Depke, Andrew Mueller, **Md Sahil Hassan**, Ali Akoglu, and Mehmet Esat Belviranli, "Contention-aware Performance Modeling for Heterogeneous Edge and Cloud Systems," In *Proceedings of the 3rd Workshop on Flexible Resource and Application Management on the Edge*, pp. 27–31, 2023.

[C6] Alexander Fusco, **Md Sahil Hassan**, Joshua Mack, and Ali Akoglu, "Hardware-based Scheduler Implementation for Dynamic Workloads on Heterogeneous SoCs," In *IFIP/ IEEE 30th International Conference on Very Large Scale Integration,* pp. 1-6, 2022.

[C7] DW Bliss, T Ajayi, A Akoglu, I Aliyev, T Basaklar, L Belayneh, D Blaauw, J Brunhaver, C Chakrabarti, L Chang, K-Y Chen, M-H Chen, X Chen, AR Chiriyath, A Daftardar, R Dreslinski, A Dutta, AJ Farcas, Y Fu, A Goksoy, X He, **Md S Hassan**, A Herschfelt, J Holtom, H-S Kim, AN Krishnakumar, Y Li, O Ma, J Mack, S Mallik, SK Mandal, R Marculescu, B McCall, T Mudge, UY Ogras, V Pandey, S Siddiqui, Y-H Sun, A Venkataramani, X Wei, BR Willis, H Yu, Y Yue, "Enabling Software-Defined RF Convergence with a Novel Coarse-Scale Heterogeneous Processor," In *2022 IEEE International Symposium on Circuits and Systems (ISCAS)*, IEEE, pp. 443–447, 2022.

[C8] Burak Unal, **Md Sahil Hassan**, Joshua Mack, Nirmal Kumbhare, and Ali Akoglu, "Design of high throughput FPGA-based testbed for accelerating error characterization of LDPC codes," In *2019 International Conference on ReConFigurable Computing and FPGAs (ReConFig)*, IEEE, pp. 1–8, 2019.

[C9] Hasanur Rahman Chowdhury, **Md Sahil Hassan**, and Anis Ahmed, "Analysis of path loss characteristics in body area network for different physical structures," In *2016 9th International Conference on Electrical and Computer Engineering (ICECE)*, IEEE, pp. 299–302, 2016.

Patents

[P1] Ali Akoglu, Serhan Gener, **Md Sahil Hassan**, Joshua Andrew Mack, "Runtime Integrated Memory Management System for Heterogeneous Computing," Invention of Authorship Disclosure filed to Tech Launch Arizona, UA25-270, 2025.

[P2] Chaitali Chakrabarti, Umit Ogras, Ahmet Goksoy, Anish Krishnakumar, Ali Akoglu, **Md Sahil Hassan**, Radu Marculescu, Allen-jasmin Farcas, "Dynamic adaptive scheduling for energy-efficient heterogeneous systems-on-chip and related aspects," U.S. Patent number 2024/0103908 A1, Date: March 28, 2024.

[P3] Ali Akoglu, Joshua Andrew Mack, **Md Sahil Hassan**, Mustafa Ghanim, Serhan Gener, Chaitali Chakrabarti, Daniel Bliss, Jacob Holtom, Umit T. Ogras, Aditya Ukarande,

"Framework for Domain-Specific Embedded Systems," Invention of authorship disclosure and provisional patent application filed October 10, 2023, U.S. patent application number: 63/591,341.

[P4] Ali Akoglu, Joshua Andrew Mack, **Md Sahil Hassan**, Serhan Gener, Hasan Umut Suluhan, "Framework for domain-specific embedded systems," Invention of authorship disclosure and provisional patent application filed October 10, 2023, U.S. patent application number: 63/591,327.