MUHAMMAD RASHED

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SUMMARY

I am a tenure-track assistant professor in the Department of Computer Science and Engineering (CSE) at the University of Texas at Arlington. My research interests include electronic design automation for next-generation computing systems, artificial intelligence acceleration, and sustainable computing.

EXPERIENCE

University of Texas at Arlington, Arlington, Texas *2024- Present*
Assistant Professor in the Department of Computer Science and Engineering (CSE)

EDUCATION

University of Central Florida, Orlando *2024*
PhD in Computer Engineering, Department of ECE
Thesis: *Towards Energy-Efficient In-Memory Computing Systems using Electronic Design Automation*

Bangladesh University of Engineering and Technology *2015*
Bachelor of Science, Department of Electrical and Electronics Engineering

SELECTED AWARDS AND HONORS

- Dr. Alireza Seyedi Doctoral Research Innovation Scholarship 2024
- IEEE/ACM William J. McCalla **ICCAD Best Paper Award Nomination** 2022
- Acknowledgment of the XORG Paper as a **Publicity Paper at DAC** 2022
- David T. and Jane M. Donaldson Memorial Graduate Scholarship 2022
- **Best Research Video Award** at the Design Automation Conference (DAC) 2021

RESEARCH PAPER PUBLICATIONS

Major Research Topics:

- Electronic Design Automation (EDA) for Emerging Computing Paradigms
- Artificial Intelligence (AI) and Machine Learning (ML)
- Computer-aided Design (CAD) for Very Large-Scale Integration (VLSI)
- Computer Architecture

Recent Peer-Reviewed Publications

[P19] **[ICCAD'24]** S. Thijssen, **M Rashed**, M. Ahmed, S. Singireddy, SK Jha, and R Ewetz, "Equivalence Checking for Flow-Based Computing using Iterative SAT Solving", in 43rd International Conference On Computer Aided Design (ICCAD), 2024.

[P18] **[DAC'24]** **M Rashed**, S Thijssen, D. Simon, SK Jha, and R Ewetz, "Execution Sequence Optimization for Processing In-Memory using Parallel Data Preparation", in 61st Design Automation Conference (DAC), 2024.

[P17] **[DAC'24]** S Thijssen, **M Rashed**, SK Jha, and R Ewetz, "Synthesis of Compact Flow-based Computing Circuits from Boolean Expressions", in 61st Design Automation Conference (DAC), 2024.

[P16] **[ASP-DAC'24]** S Thijssen, **M Rashed**, SK Jha, and R Ewetz, "READ-based In-Memory Computing using Sentential Decision Diagrams", 29th Asia and South Pacific Design Automation Conference (ASP-DAC), 2024.

[P15] **[ASP-DAC'24]** S Thijssen, **M Rashed**, SK Jha, and R Ewetz, "Towards Area-Efficient Path-Based In-Memory Computing using Graph Isomorphisms", 29th Asia and South Pacific Design Automation Conference (ASP-DAC), 2024.

[P14] **[ICCAD'23]** **M Rashed**, S Thijssen, SK Jha, and R Ewetz, "Automated Synthesis for In-Memory Computing", 42nd International Conference On Computer Aided Design (ICCAD), 2023.

[P13] **[ICCAD'23]** **M Rashed**, S Thijssen, SK Jha, H Zheng, and R Ewetz, "Path-based Processing using In-Memory Systolic Arrays for Accelerating Data-Intensive Applications", 42nd International Conference On Computer Aided Design (ICCAD), 2023.

[P12] **[ICCAD'23]** S Thijssen, S. Singireddy, **M Rashed**, SK Jha, and R Ewetz, "Verification of Flow-Based Computing Systems using Bounded Model Checking", 42nd International Conference On Computer Aided Design (ICCAD), 2023.

[P11] **[TCAD'23]** **M Rashed**, S Thijssen, F Yao, SK Jha, and R Ewetz, "STREAM: Towards READ-based In-Memory Computing for Streaming Based Processing for Data-Intensive Applications", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 2023

[P10] **[TCAD'23]** S Thijssen, **M Rashed**, SK Jha, and R Ewetz, "PATH: Evaluation of Boolean Logic using Path-based In-Memory Computing Systems", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), 2023.

[P9] **[ICCD'23]** S. Singireddy, **M Rashed**, S Thijssen, SK Jha, and R Ewetz, "Input-Aware Flow-Based In-Memory Computing", 41st International Conference on Computer Design (ICCD), 2023.

[P8] **[DAC'23]** S Thijssen, **M Rashed**, SK Jha, and R Ewetz, "UpTime: Towards Flow-based In-Memory Computing with High Fault-Tolerance", in 60th Design Automation Conference (DAC), 2023.

[P7] **[ASP-DAC'23]** **M Rashed**, SK Jha, and R Ewetz, "Discovering the In-Memory Kernels of 3D Dot-Product Engines", 28th Asia and South Pacific Design Automation Conference (ASP-DAC), 2023.

[P6] **[ICCAD'22]** **M Rashed**, SK Jha, and R Ewetz, "Logic Synthesis for Digital In-Memory Computing", 41st International Conference On Computer Aided Design (ICCAD), 2022. **(Best paper nomination)**

[P5] **[DAC'22]** **M Rashed**, A Awad, SK Jha, and R Ewetz, "Towards Resilient Analog In-Memory Deep Learning via Data Layout Re-Organization", 59th Design Automation Conference (DAC), 2022. **(Publicity Paper)**

[P4] **[DATE'22]** **M Rashed**, SK Jha, F Yao and R Ewetz, "Hybrid Digital-Digital In-Memory Computing", 25th Design Automation and Test in Europe Conference (DATE), 2022.

[P3] **[ASP-DAC'22]** **M Rashed**, S Thijssen, F Yao, SK Jha, and R Ewetz, "STREAM: Towards READ-based In-Memory Computing for Streaming based Data Processing", 27th Asia and South Pacific Design Automation Conference (ASP-DAC), 2022.

[P2] **[ICCAD'21]** **M Rashed**, SK Jha, and R Ewetz, "Hybrid Analog-Digital In-Memory Computing", 40th International Conference On Computer Aided Design (ICCAD), 2021.

[P1] **[MICRO'21]** M Chowdhuryy, **M Rashed**, A Awad, R Ewetz, and F Yao, "LADDER: Architecting Content and Location-aware Writes for Crossbar Resistive Memories", 54th International Symposium on Microarchitecture (MICRO), 2021.

TALKS/POSTER PRESENTATIONS

[T3] **[DATE'22]** PhD Forum, in 26th Design Automation and Test in Europe Conference (DATE) 2023
[T2] **[DAC'22]** PhD Forum, in 59th Design Automation Conference (DAC) 2022
[T1] **[DAC'21]** Young Fellow Program, in 58th Design Automation Conference (DAC) 2021

TEACHING EXPERIENCE

- **CSE 2312. Computer Organization and Assembly Language Programming** Fall'2024

  Computer organization from the viewpoint of software, including instruction set architectures, memory addressing, integer and floating-point representation and arithmetic, instruction pipelining, cache, memory

virtualization, and I/O. The relationship of higher-level programming languages to assembly language and instruction set architecture is also explored.

PROFESSIONAL SERVICE

- Technical Reviewer, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) 2024
- Technical Reviewer, IEEE Transactions on Computers (TC) 2024
- Technical Reviewer, IEEE Internet of Things Journal 2023
- Session Chair, Design Automation Conference (DAC) 2022
- Technical Reviewer, IEEE Transactions on Emerging Topics in Computing (TETCI) 2022
- Technical Reviewer, International Symposium on Quality Electronic Design (ISQED) 2024
- Technical Reviewer, International Conference on Computer Design (ICCD) 2021, 2022
- Technical Reviewer, The Great Lakes Symposium on VLSI (GLSVLSI) 2021, 2022
- Technical Reviewer, International Conference on AI Circuits and Systems (AICAS) 2022, 2023

SKILLS

- *Programming Language*: C++, Python, MATLAB and Verilog.
- *EDA Tools*: Design Compiler, ABC, YOSYS, SIS, Vivado Design Suite, CACTI 7, ARM Forge
- *Operating Systems and Software*: Linux, Windows, Office Software, Latex, AutoCad.

TRAINING

- Information Security Awareness Training (UCF) 2024
- Responsible Conduct of Research for Engineers- Stage 2 (CITI) 2023
- Authorship, Credit and Collaborative Scholarship (UCF) 2022
- Doing the Right Thing: Know About Research Misconduct (UCF) 2022
- at-risk for University and College Faculty and Stuff (UCF) 2020
- at-risk Friends in College (UCF) 2020
- Employee Code of Conduct & Speak Up Whistleblower Training (UCF) 2020
- Academic Integrity Module (UCF) 2020
- Responsible Conduct of Research for Engineers- Stage 1 (CITI) 2020
- Teaching Assistant Training (UTSA) 2019