

KAZI ABU ZUBAIR

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SUMMARY

CPU architect specializing in **instruction set architecture (ISA), CPU microarchitecture, workload characterization, and performance analysis**. Experience in architectural pathfinding and development of next-generation CPU features for **x86**, including Intel Advanced Performance Extensions (APX). Experienced in simulation-driven architectural evaluation, performance bottleneck analysis, and hardware–software co-design. Ph.D. in Computer Engineering with publications in **ISCA, MICRO, and HPCA**.

PROFESSIONAL EXPERIENCE

Intel Corporation

CPU Architect

Folsom, CA

Aug. 2022 – Present

- Contribute to the **exploration, pathfinding, and development of next-generation CPU architecture and ISA features** for high-performance processors.
- Drive architectural evaluation of new **ISA and microarchitecture (uArch) features** through workload characterization, performance analysis, architectural modeling, and simulation-based studies.
- Analyze application workloads and instruction behavior to identify **performance bottlenecks and architectural opportunities** across CPU subsystems.
- Evaluate architectural trade-offs across **x86 and Arm** designs to guide future CPU architecture and ISA decisions.
- Contribute to the pathfinding and development of **Intel Advanced Performance Extensions (Intel APX)** and other architectural capabilities.
- Collaborate across **architecture, microarchitecture, compiler, performance, and validation** teams to evaluate proposals and drive data-driven architectural decisions.

North Carolina State University

Graduate Research Assistant

Raleigh, NC

Aug. 2020 – Jul. 2022

- Conducted research in **secure, reliable, and high-performance computer architecture**, with emphasis on persistent and non-volatile memory systems.
- Developed architectural mechanisms addressing memory encryption, integrity protection, crash recovery, reliability, and secure filesystem support.
- Published research in premier computer architecture venues including **ISCA, MICRO, and HPCA**.

University of Central Florida

Graduate Research Assistant

Orlando, FL

Aug. 2018 – Aug. 2020

- Researched architectural mechanisms for **secure and crash-consistent non-volatile memory systems**.
- Investigated hardware–software techniques for persistence, security, recovery, and reliability in emerging memory architectures.

Intelligent Business Solutions (IBSL)

Senior Assistant Engineer

Dhaka, Bangladesh

Aug. 2017 – Jun. 2018

- Developed software for enterprise access-control and security systems.

TECHNICAL EXPERTISE

- **CPU Architecture:** Instruction Set Architecture (ISA), CPU core microarchitecture, out-of-order processors, scalar and vector/SIMD architectures, architectural pathfinding.
- **ISA:** x86, Intel APX, AVX/vector ISA, Arm, RISC-V.
- **Performance:** Workload characterization, performance bottleneck analysis, architectural performance modeling, instruction-level analysis, simulation-driven microarchitecture evaluation.
- **Software / Compilers:** C/C++, Python, Bash, assembly, LLVM, Linux, Git.
- **Modeling & Simulation:** Functional and cycle-accurate architectural simulation; gem5, QEMU; Intel architectural modeling and simulation tools including Coho, ASIM, Funcsim, Archlib, and Intel SDE.
- **Research:** Processor and memory-system architecture, architectural security, persistent memory, memory encryption and integrity.

EDUCATION

North Carolina State University

Raleigh, NC

Ph.D., Computer Engineering

2022

Research: Secure Processor Architecture and Persistent Memory

Advisor: Prof. Amro Awad

University of Chittagong

Chittagong, Bangladesh

B.Sc., Applied Physics, Electronics & Communication Engineering

2016

SELECTED PUBLICATIONS

1. **K. A. Zubair**, D. Mohaisen, A. Awad. "Filesystem Encryption or Direct-Access for NVM Filesystems? Let's Have Both!" *IEEE HPCA*, 2022.
2. **K. A. Zubair**, S. Gurumurthi, V. Sridharan, A. Awad. "Soteria: Towards Resilient Integrity-Protected and Encrypted Non-Volatile Memories." *IEEE/ACM MICRO*, 2021.
3. **K. A. Zubair**, A. Awad. "Anubis: Ultra-Low Overhead and Practical Recovery Time for Secure Non-Volatile Memories." *ACM/IEEE ISCA*, 2019.
4. A. Awad, M. Ye, Y. Solihin, L. Njilla, **K. A. Zubair**. "Triad-NVM: Persistency for Integrity-Protected and Encrypted Non-Volatile Memories." *ACM/IEEE ISCA*, 2019.

Full publication list: [Google Scholar](#)

PATENTS

- **System and Method for Ultra-Low Overhead and Recovery Time for Secure Non-Volatile Memories.**

SELECTED AWARDS

- NCSU Computer Engineering Summer Graduate Merit Award, 2021.
- ISCA Student Travel Grant, 2019.
- NSF Student Travel Grant – HPCA, 2019.