KAZI ABU ZUBAIR

625 Centennial Pkwy, 302, Raleigh, NC-27606

(+1)407 633 2923 ⋄ kabuzub@ncsu.edu ⋄ kazi-zubair.github.io

PROFESSIONAL AND RESEARCH SUMMARY

- Strong research background in Computer Architecture, Emerging Memory Systems, Security and Reliability.
- Multiple publications in top computer architecture conferences.

EDUCATION

North Carolina State University   *NC, USA*
Doctor of Philosophy   2022 (expected)
Computer Engineering
Research Focus: Secure Processors; Performance, Security and Reliability for Non-Volatile Memory.
Advisor: Dr. Amro Awad

University of Chittagong   *Chittagong, Bangladesh*
Bachelor of Science   *2016*
Applied Physics, Electronics & Communication Engineering.

PUBLICATIONS

1. **Kazi Abu Zubair**, Aziz Mohaisen, Amro Awad, "*Filesystem Encryption or Direct-Access for NVM Filesystems? Let's Have Both!,*" in 28th IEEE International Symposium on High-Performance Computer Architecture, **HPCA-2022.**

2. **Kazi Abu Zubair**, Sudhanva Gurumurthi, Villas Sridharan, Amro Awad, "*Soteria: Towards Resilient Integrity-Protected and Encrypted Non-Volatile Memories,*" in 54th IEEE/ACM International Symposium on Microarchitecture, **MICRO-2021**.

3. Yu Zou, **Kazi Abu Zubair**, Mazen Alwadi, Rakin Mohammad Shadab, Sanjay Gandham, Amro Awad, Minjie Lin, "*ARES: Persistently Secure Non-Volatile Memory with Processor-Transparent And Hardware-Friendly Integrity Verification And Metadata Recovery,*" ACM Transactions on Embedded Computing Systems, 2021.

4. Mazen Alwadi, **Kazi Abu Zubair**, Aziz Mohaisen, and Amro Awad, "*Phoenix: Towards Ultra-Low Overhead, Recoverable, and Persistently Secure NVM,*" IEEE Transactions on Dependable and Secure Computing, 2020.

5. **Kazi Abu Zubiar** and Amro Awad, "*Ensuring Fast Crash Recovery for Secure NVMs,*" in 11th Annual Non-Volatile Memories Workshop, **NVMW - 2020**.

6. **Kazi Abu Zubiar** and Amro Awad, "*Anubis: Ultra-Low Overhead and Practical Recovery Time for Secure Non-Volatile Memories,*" in 46th International Symposium on Computer Architecture, **ISCA - 2019**.

7. Mao Ye, **Kazi Abu Zubair**, Aziz Mohaisen, and Amro Awad, "*Towards low-cost mechanisms to enable restoration of encrypted non-volatile memories,*" IEEE Transactions on Dependable and Secure Computing, 2019.

8. Amro Awad, Mao Ye, Yan Solihin, Laurent Njilla and **Kazi Abu Zubair**, "*Triad-NVM: Persistency for Integrity-Protected and Encrypted Non-Volatile Memories,*" in 46th International Symposium on Computer Architecture, **ISCA - 2019**.

9. Amro Awad, Suboh Suboh, **Kazi Abu Zubair**, Mao Ye and Mazen Al-Wadi, *"Persistently-Secure Processors: Challenges and Opportunities for Securing Non-Volatile Memories,"* in IEEE Computer Society Annual Symposium on VLSI, **ISVLSI - 2019**.

PATENTS

1. **Kazi Abu Zubiar** and Amro Awad, *"System and method for ultra-low overhead and recovery time for secure non-volatile memories,"* US Patent App. 16/892,019, 2020.

PRESENTATION/POSTERS

1. *(Presentation)* Soteria: Towards Resilient Integrity-Protected and Encrypted Non-Volatile Memories (MICRO 2021).

2. *(Presentation)* Persistently-Secure Processors: Challenges and Opportunities for Securing Non-Volatile Memories (ISVLSI 2019).

3. *(Presentation)* Anubis: Ultra-Low Overhead and Practical Recovery Time for Secure Non-Volatile Memories (ISCA 2019).

4. *(Poster)* Anubis: Ultra-Low Overhead and Practical Recovery Time for Secure Non-Volatile Memories (ISCA 2019).

RESEARCH EXPERIENCE

Graduate Research Assistant   *2020 - Current*

Secure and Advance Computing Architecture (SACA), NCSU

- Conducted research on Non-Volatile Memory (NVM) security and reliability.

- Explored encrypted and integrity protected DAX file system.

- Explored reliability for hybrid memory.

Graduate Research Assistant   *2018 - 2020*

Secure and Advance Computing Architecture (SACA), UCF

- Conducted research on Non-Volatile Memory (NVM) security and reliability.

- Explored crash consistent and recoverable NVM system.

Research Intern   *2014 - 2015*

Research Group to Aid Child Development (RGACD), University of Chittagong

- Developed training and learning devices for children with special needs.

WORKING EXPERIENCE

Senior Assistant Engineer   *2017 - 2018*

IBSL, Dhaka Bangladesh

- Worked to develop access control and security software.

Embedded Systems Engineer   *2016 - 2017*

StellarBD, Chittagong Bangladesh

- Worked in the R&D to develop firmware for Texas Instrument CC25xx processors.

- Designed PCB and hardware prototypes.

TEACHING EXPERIENCE

Graduate Teaching Assistant *2018 - 2019*

University of Central Florida

- Worked as a Teaching Assistant for Engineering Analysis & Computation course (EGN3211).

RESEARCH INTERESTS

- Secure Memory Architecture
- Memory Reliability
- Hardware Support for Homomorphic Encryption
- Cloud Computing Security
- Internet of Things
- In-memory Computing

TEACHING INTERESTS

- Introductory Programming Courses
- Data Structures
- Computer Architecture
- Memory Systems
- Operating Systems
- Embedded Systems
- Compiler Construction

  and related courses.

PROJECTS

Crash Recovery Support for Secure NVMs

- Architectural support for fast crash recovery of NVM memories.
- Novel MAC recovery schemes in crash-consistent secure NVMs.

Performance Enhancement of Secure Memories

- Low-cost encryption and integrity protection support.
- Optimized MAC calculation latency in secure memories.

Reliability support in confidential and integrity supported NVM

- Metadata cloning schemes for enhanced reliability of secure NVMs.
- Low-cost reliability support in hybrid Memories.

FPGA-based hardware support for NVM security

- Collaborated in developing an FPGA prototype for a secure NVM controller.
- Explored implementation of different memory encryption and secure hashing schemes in FPGA.

Memory Encryption and Integrity Protection in Low-Power Intermittent Power Systems

- Collaborated in implementing secure memory support in intermittent power devices.

AWARDS

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

RESEARCH COLLABORATIONS

- Secure and crash consistent intermittent computing architecture *(Purdue University)*
- Secure and Reliable Hybrid Memory Systems *(Sandia National Labs)*
- Non-Volatile Memory Reliability *(AMD RAS Architecture)*
- FPGA-Assisted Secure Memory *(DARPA, UCF)*

REFERENCES

Amro Awad, North Carolina State University   *ajawad@ncsu.edu*

Sudhanva Gurumurthi, AMD   *sudhanva.gurumurthi@amd.com*

David Mohaisen, University of Central Florida   *david.mohaisen@ucf.edu*