

Chidera Biringa

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EDUCATION

University of Massachusetts Dartmouth

MA, US

College of Engineering, ABET Accredited

September 2021 - 2025 (Expected)

Ph.D. in Engineering and Applied Science (Computer Science and Information Systems)

- Research Interest: I am interested in developing software systems that prevent the introduction of security vulnerabilities during the development phase of SDLC. Currently, I am building **Security-in-the-Middle (SiTM)**, a novel vulnerability state integrated into Git and tasked with sandboxing secrets such as textual passwords and cryptographic and authentication values in transit to GitHub.

University of Massachusetts Dartmouth

MA, US

College of Engineering, ABET Accredited

September 2019 - May 2021

M.S. (Master of Science) in Computer and Information Science

- Graduate Research Award Recipient

Bells University of Technology

Ota, Nigeria

College of Natural and Applied Sciences

November 2013 - May 2017

B.Tech. (Bachelor of Technology) in Computer Science and Information Technology

PROFESSIONAL EXPERIENCE

College of Engineering - UMass Dartmouth

September 2020 - Present

Graduate Research Assistant

- Currently performing research on proactive software security, secure software development, backdoor attacks, and intrusion detection systems

NSA/DHS Cybersecurity Center

May 2020 - Present

Doctoral Student Fellow

- Currently, I am investigating the performance implications of symmetric, asymmetric, and homomorphic encryption in ML
- Conducted research on software performance and security with Dr. Gokhan Kul and Dr. Lance Fiondella
- Mentored three undergraduate students toward the completion of their Research Experience for Undergraduates (REU) program

PEER-REVIEWED DOCTORAL PUBLICATIONS

- **Chidera Biringa**¹, Gokhan Kul. 2021. "Automated User Experience Testing through Multi-Dimensional Performance Impact Analysis" ACM/IEEE 2nd International Conference on Automation of Software Test co-located with the International Conference on Software Engineering (ICSE'21)
- Gokhan Kul, **Chidera Biringa**². 2022. "Forensics in Cyber-Physical Systems (CPS)" Springer Cyber Forensics for Cyber-Physical Systems.
- **Chidera Biringa**¹, Gaspard Baye and Gokhan Kul. 2022. "Static and Microarchitectural ML-Based Approaches For Detecting Spectre Vulnerabilities and Attacks" Hardware and Architectural Support for Security and Privacy (HASP'22), in conjunction with the 55th IEEE/ACM International Symposium on Microarchitecture (MICRO'22)
- **Chidera Biringa**¹ and Gokhan Kul. 2022. "A Secure Design Pattern Approach Toward Tackling Lateral-Injection Attacks" The 15th IEEE International Conference on Security of Information and Networks (SIN)
- **Chidera Biringa**¹ and Gokhan Kul. 2022. "BERT-Assisted Detection of Secrets in GitHub Repositories" The Security Track at the ACM Symposium on Applied Computing (SAC) — **Currently Under Review**
- **Chidera Biringa**¹ and Gokhan Kul. 2022. "Exposing Mediocre Performance Code" The 16th IEEE International Conference on Software Testing, Verification and Validation (ICST) — **Currently Under Review**

TECHNICAL SKILL

Research Program Analysis, Vulnerability Detection & Prevention in SDLC, NLP & ML for Preventive Security

Programming Languages & Paradigms C, C++, Java, Python, R, SQL, HTML/CSS & JavaScript. OOP, FP, PP, IP, & DP

SELECTED PROJECTS

iFuzz | Intelligent Fuzzing using Deep-Reinforcement Learning

September 2021 - Present

- Developing a Markov Decision Process-enabled Actor-Critic (AC) Reinforcement learning (RL) multi-agent to identify bugs using mutation and software coverage

Neural Network Model | Predictive Frame Inference (PIF) Model

April - May 2020

- Built a generative adversarial neural network that interpolates in-between frames of a given video, thus increasing the frame rate. A high definition 25 fps video was increased to 50 fps without loss in resolution, reduced length of the video, or noticeable distortion

Database System | SQL Query Evaluator

February - April 2020

- Built an optimized SQL query evaluator for a single-threaded database that can run TPC-H queries. Implemented support for Select, Project, Cross Product, Union, and Aggregate operations

SERVICES

- Very Large Data Base (VLDB) Reproducibility Reviewer. 2021
- Startup Weekend UMassD Technical Mentor. 2021 & 2022