Chidera Biringa

(508) 863-7923 | biringachidera@gmail.com | biringachi.github.io/lines/ | biringaChi | chidera-biringa

Education

University of Massachusetts Dartmouth — MA, US

College of Engineering, ABET Accredited

Ph.D. in Engineering and Applied Science (Computer Science and Information Systems) — September 2021 - Present

- Courses Taken: Advanced Engineering Mathematics, Computational Methods, Secure Software Development, Software Systems Design, Artificial Intelligence, and Advanced Computer Systems
- Research Area: Secure Software Development. Intrusion Detection Systems. Software Performance and Reliability

University of Massachusetts Dartmouth — MA, US

College of Engineering, ABET Accredited

M.S. (Master of Science) in Computer and Information Science (Honors) — September 2019 - December 2020

- Courses Taken: Algorithms and Complexity, Advanced Data Mining, Advanced Machine Learning, Database Design
- Award: CIS Graduate Research Award Recipient

Bells University of Technology — Ota, Nigeria

College of Natural and Applied Sciences

B.Tech. (Bachelor of Technology) in Computer Science and Information Technology (Honors) — November 2013 - May 2017

Professional Experience

College of Engineering - UMass Dartmouth — September 2021 - Present

Graduate Research Assistant

- Currently performing research on secure software development, backdoor attacks and intrusion detection systems
- Currently performing research on software performance prediction, testing, reliability and microbenchmarking
- Performed research on security exploits that originate from vulnerability in speculative execution inherent in modern-day microprocessors

NSA/DHS Center of Academic Excellence in Cyber Defense Research (CAE-R) — May - Present

Graduate Student Research Fellow and Mentor

- Conducted research on software performance with Dr. Gokhan Kul
- Mentored two undergraduate students towards the completion of their Research Experience for Undergraduates (REU) program

CIS Dept. - UMass Dartmouth — September 2020 - May 2021

Graduate Research Assistant

- Research assistant for Dr. Gokhan Kul (Interest: Cybersecurity and Database Systems)
- Developed an Automated User Experience Testing System methodology through multi-dimensional performance impact analysis

NSA/DHS Center of Academic Excellence in Cyber Defense - UMass Dartmouth — September 2020 - Present

Graduate Fellow

- Fellow at the NSA/DHS Center of Academic Excellence in Cyber Defense at the UMass Dartmouth

CIS Dept. - UMass Dartmouth — September - December 2019

Graduate Student Grader

- Former grader for the undergraduate course: *Software Process and Project Management*
- Graded assignments, projects, and exams

CIS Dept. - UMass Dartmouth — August 2019

iOS Camp Instructor

- Worked as an instructor at the UMass Dartmouth iOS Mobile App Development Camp under the supervision of Dr. Raymond N. Laoulache
- The team taught campers programming, problem-solving and iOS mobile app development using the Swift 5 programming language

Nigerian National Petroleum Corporation — Port Harcourt, Nigeria

Software Engineering Intern — May - August 2015

- Worked as a software engineer at the NNPC/PPMC ETSD Department
- Developed webpages for the engineering section of the company
- Updated the software of over 100 desktop computers and laptops in the refinery

Publication

- 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*
- Gokhan Kul, Chidera Biringa[2]. 2022. Forensics in Cyber-Physical Systems (CPS) (Chapter 1). *Springer Cyber Forensics for Cyber-Physical Systems.*

- Chidera Biringa[1], Baye Gaspard and Gokhan Kul. 2022. SPECDET: Fast Spectre Vulnerabilities and Attack Detection via Gadgets and CPU-Processes State. *IEEE Secure Development Conference (SecDev) – Under Review*
- Chidera Biringa[1] and Gokhan Kul. 2022. BISI: Towards Delegating Lateral-Injection Attack Security Strategies via Secure-Behavioral Design. *IEEE Secure Development Conference (SecDev) – Under Review*

Technical Skill

Programming Languages	C, C++, Java, Python, R, SQL, HTML/CSS, JavaScript
Databases	MySQL, NoSQL
Libraries, Packages	Pytorch, Scikit-Learn, Caret, OpenCV, Pandas, Bootstrap, Quanteda, Tidyverse, Git
Software	GitHub, VSCode, MS Office, LaTeX, Power Bi, Tableau, Godot, Travis CI
Programming Paradigms and others:	OOP, FP, PP, IP, Agile Development, MVC, UML, Unit Testing, Integration Testing

Technical Experience

iFuzz | Intelligent Fuzzing using Deep-Reinforcement Learning
September 2021 - Present

- Utilized Markov Decision Process (MDP) to deploy a multi-agent Actor-Critic (AC) Reinforcement learning (RL) technique to identify bugs via mutation and software coverage
- The agents developed a policy that maximizes the cumulative rewards by generating quality mutation samples and causing rapid crashes

SEF | Source Code Evaluation Framework
August 2021 - September 2021

- Developed a source-code based evaluation framework for software performance learning
- SEF provides a zero upfront effort performance estimation method and presents the evaluation of the automated QoE testing method

Master's Thesis | Multi-Dimensional Performance Impact Analysis of Security Updates in Software Development Lifecycle
September 2020 - March 2021

- Developed a novel automated user experience testing methodology
- Built a pipeline of regression models capable of learning how code changes impact the test time unit of a software
- Created a robust code stylometry feature set using layout, lexical and syntactic features
- Created a benchmark dataset to enable experiments in software engineering research

Neural Network Model | Predictive Frame Inference (PIF) Model
April - May 2020

- Built an encoder-decoder convolutional neural network that can interpolate 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 distortions

Database System | SQL Query Evaluator
February - April 2020

- Built an 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
- Implemented standard optimization techniques like projection pushdown, selection pushdown & cross product to join conversion

Classification Model | Authorship Attribution
November - December 2019

- Built a random forest classification model that predicts Victorian Era Authors based on their authored novels
- Sentiment features were extracted and used as features in the model

References

Dr. Lance Fiondella. lfiondella@umassd.edu. 508-999-8596

Director, Cybersecurity Center, A NSA/DHS designated Center of Academic Excellence in Cyber Defense Research (CAE-R). University of Massachusetts Dartmouth

Dr. Gokhan Kul. gkul@umassdedu. 508-910-6484

Assistant Professor and Ph.D Supervisor. University of Massachusetts Dartmouth