Chidera Biringa

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Education

University of Massachusetts Dartmouth — MA, US

College of Engineering — Ph.D. in Engineering and Applied Sciences - Computer Science — September 2021 - 2024

- *Advisor: Prof. Gökhan Kul*
- **Research Interest:** Software Security, Machine Learning, Natural Language Understanding and Software Performance

University of Massachusetts Dartmouth — MA, US

College of Engineering — M.S. in Computer Science — September 2019 - May 2021

- *Advisor: Prof. Ming Shao*

Bells University of Technology — Ota, Nigeria

College of Natural and Applied Sciences — B.Tech. in Computer Science — November 2013 - May 2017

Professional Experience

College of Engineering - University of Massachusetts Dartmouth — September 2020 - Present

Research Assistant

- Developing **LIM:** Cost-Efficient Vulnerability Detection.
- Developed **PACE:** Program Analysis Framework for Continuous Performance Prediction, **CADE:** Context-Aware Detection of Embedded Credentials via Large Language Models, **SPECDET:** Detecting Spectre Vulnerabilities and Attacks, **SEAL:** Secure Design Pattern Approach Toward Tackling Lateral-Injection Attacks.

NSA/DHS CAER - University of Massachusetts Dartmouth — May 2020 - Present

Research Assistant

- Conducted research on software performance and security, and open-world recognition for network intrusion detection systems.
- Mentored 3 students participating in the National Science Foundation-Undergraduate Research program from the University of Massachusetts Dartmouth, University of Maryland College Park, and Arizona State University in software vulnerability and user experience testing research.

Peer-Reviewed Doctoral Publications

- **Chidera Biringa** and Gokhan Kul. 2023. PACE: Program Analysis Framework for Continuous Performance Prediction. **[Preprint]**
- **Chidera Biringa** and Gokhan Kul. 2023. CADE: Context-Aware Detection of Embedded Credentials. **[Preprint]**
- **Chidera Biringa**, Gaspard Baye and Gokhan Kul. 2022. "Static and Microarchitectural ML-Based Approaches For Detecting Spectre Vulnerabilities and Attacks" HASP'22 in conjunction with the 55th IEEE/ACM MICRO'22. **[Paper]**
- **Chidera Biringa** 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). **[Paper]**
- Gokhan Kul, **Chidera Biringa**. 2022. "Forensics in Cyber-Physical Systems (CPS)" Springer Cyber Forensics for Cyber-Physical Systems.
- **Chidera Biringa**, Gokhan Kul. 2021. "Automated User Experience Testing through Multi-Dimensional Performance Impact Analysis" ACM/IEEE 2nd International Conference on AST co-located with the International Conference on Software Engineering (ICSE'21). **[Paper]**

Selected Projects

- **PIF: Predictive Frame Inference using Generative Adversarial Network (GAN)— (April - May 2020):** Developed a GAN model 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 video length, or noticeable distortion. Generated frames were stitched to create a full synthetic video. **[Code]**
- **Database Engine — (February - April 2020):** Developed an SQL query evaluator with operational support for select, project, join, union, aggregate, and standard optimization techniques such as projection and selection pushdown and cross-product to join conversion. **[Code]**
- **Authorship Attribution — (November 2019):** Developed ML classifiers to detect Victorian Era (VE) authors using statistical features of authored novels. Conducted an exhaustive text mining and sentiment analysis. Best-performing classifier achieved 99% predictive accuracy. **[Code]**
- **Chatbot — (December 2019):** Developed a customer response chatbot to classify responses to customer inquiries. **[Code]**

Technical Skill

Research: Code Performance, Natural Language Processing, Threat Modeling, Vulnerability Assessment & Machine Learning.

Programming Languages: C/C++/C#, Java, Python, R, SQL, MATLAB, PHP, Swift, Bash, HTML/CSS & JavaScript.

Transferable Skill

Soft: Creativity, Learning, Analytical Reasoning, Communication, Evaluation, Mentoring, Management, Collaboration & Presentation.

Services

- Startup Weekend UMD Technical Mentor. 2023, 2022 & 2021.
- Very Large Data Base (VLDB) Reproducibility Reviewer. 2021.

Note: Source code for selected projects can be found on my GitHub Account Above