

David Love Adei

Computer Science Ph.D. Candidate, NC State University, Raleigh

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Professional Summary

- **Researcher, Technologist and Protocol Architect** with **8+ years'** experience in systems security, privacy-preserving technologies, cryptographic protocols, distributed security engineering, and software engineering.
- Recognized for bridging **advanced research and practical impact**, with multiple **ACM CCS Distinguished Awards** for work in telecom fraud mitigation and cloud security.
- Technical leader experienced in mentoring engineers, guiding cross-functional teams, and delivering complex projects from concept to deployment.
- Proficient in Go, Python, C++, cloud platforms (AWS, GCP), and open source security tools; author of several cryptographic libraries used in academic research and industry.

Expertise and Skills

- **Software Development:** Go, Python, C++, JavaScript, Java, PHP, gRPC, Node.js, React.js, Vue.js, Express.js, Flask, Laravel, PostgreSQL, MySQL, MongoDB, Redis
- **DevOps & Cloud:** Docker, Kubernetes, Terraform, Ansible, AWS, Google Cloud Platform, Linux, MacOS, Trusted Execution Environments
- **Security Engineering:** Cryptographic protocols, pairing-based cryptography, privacy-preserving systems, distributed security, code review
- **Open Source:** Author/maintainer of cryptographic libraries and security tools; technical mentorship; agile development

Employment and Experience

Graduate Research Assistant, NC State University *Aug 2022 – Present*

- Developed scalable cryptographic protocols and privacy-preserving systems, including a call traceback platform processing 50,000+ records/sec.
- Led implementation of witness encryption and secret recovery with TEEs and blockchain.

Senior Software Developer, Scopic Software *Oct 2021 – Aug 2022*

- Delivered web apps for image processing and 3D modeling, boosting client satisfaction by 35%.
- Improved uptime by 80% and reduced deployment time by 90% via Docker modernization.
- Resolved production issues, reducing downtime and bug rates significantly.

Senior Software Engineer, Cmunily *Nov 2020 – Oct 2021*

- Transitioned legacy systems to a modern mobile platform, raising user engagement by 48%.
- Redesigned platform architecture, improving scalability by 40%.

Software Engineer, Clearcare Solutions Ltd *Nov 2019 – Oct 2020*

- Modernized legacy PHP applications, achieving 630x performance and 23% growth in DAUs.
- Enhanced frontend UX, increasing user satisfaction by 15%.

Senior Software Engineer, W3MSYS Company Ltd *Jan 2017 – Nov 2019*

- Led development of a nationwide healthcare management system for 1,000+ daily users.
- Built rate-limited access microservices handling 10,000+ API requests/hr with 99.99% uptime.
- Managed agile team, increasing productivity by 24%.

Software Engineer (Freelance) *Sept 2015 – Jan 2017*

- Delivered custom software solutions, optimizing business operations across domains.

Education

- Ph.D. Computer Science**, NC State University *Aug 2022 – Present (expected 2026)*
– Focus: Applied cryptography, security engineering, distributed systems (Advisor: Dr. Bradley Reaves)
- B.Sc. Computer Science**, Kwame Nkrumah Univ. of Science & Tech. *Aug 2015 – Jul 2019*
– First Class Honors; Best Computer Science Student.

Selected Publications

1. **How to Recover a Cryptographic Secret From the Cloud**
Tanner Verber, [David Adei](#), Alessandra Scafuro, and Chris Orsini
ACM Conference on Computer and Communications Security (CCS 25') 2025.
2. **Towards Declarative Blockchains: A SHACL-Based Model for Robust and Efficient Transactions**
Kemafor Anyanwu, Sogolsadat Mansouri, and [David Adei](#)
IEEE International Conference on Blockchain and Cryptocurrency (ICBC 25') 2025.
3. **Jäger: Automated Telephone Call Traceback**
[David Adei](#), Varun Madathil, Sathvik Prasad, Bradley Reaves, and Alessandra Scafuro
ACM Conference on Computer and Communications Security (CCS 24') 2024.
★ [Distinguished Paper Award & Distinguished Artifact Award](#)

Awards and Honors

- **Distinguished Paper Award**, *ACM CCS* 2024
- **Distinguished Artifact Award**, *ACM CCS* 2024
- **Graduate Merit Award** (\$3,000), *NC State University* 2025
- **First Class Honors**, *KNUST, B.Sc. Computer Science* 2019

Authored Libraries

- **BBS Group Signatures** (C++, Go, Java): Highly optimized BBS04 group signature library, minimizing pairing operations for fast computation; includes threshold variants.
- **Witness Encryption** (C++, Python): Efficient witness encryption scheme built on BLS signatures.
- **Jäger: Automated Call Traceback** (Python, C++): Award-winning system integrating group signatures, BLS signatures, and witness encryption.
- **Cloud Secret Recovery** (Python): Blockchain-based cryptographic secret recovery using AWS Nitro Enclaves.

Professional Activities

- **Invited Talks:**
 - Invited Speaker, North Carolina Annual Cybersecurity Symposium 2025
 - Invited Speaker, SIP Network Operators Conference (SIPNOC) 2025
- **Peer Review:**
 - Sub Reviewer, IEEE Symposium on Security and Privacy (S&P) 2024
 - Sub Reviewer, IEEE Symposium on Security and Privacy (S&P) 2023
- **Leadership:**
 - Web Development Team Lead, Google Developer Student Club 2018
 - President, Computer Science Student Association, KNUST 2017