

# David Love Adei

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

 [david.adei.love](https://david.adei.love)  [lokingdav@gmail.com](mailto:lokingdav@gmail.com)  [linkedin.com/in/lokingdav](https://linkedin.com/in/lokingdav)  [Google Scholar](#)

## Professional Summary

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- Researcher and technologist 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

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- **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

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**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

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- Ph.D. Computer Science**, NC State University *Aug 2022 – Present (expected 2026)*  
– Focus: 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

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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)*, 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)*, 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)*, 2024.  
★ [Distinguished Paper Award & Distinguished Artifact Award](#)

## Awards and Honors

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- **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
- **Best Computer Science Student**, *KNUST*, 2019

## Authored Libraries

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- **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

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- **Invited Talks:**
  - Invited Speaker, North Carolina Annual Cybersecurity Symposium, 2025
  - Invited Speaker, SIPNOC (SIP Network Operators Conference), 2025
- **Peer Review:**
  - Reviewer, IEEE Symposium on Security and Privacy, 2023–2024
- **Leadership:**
  - Web Development Team Lead, Google Developer Student Club, 2018–2019
  - President, Computer Science Student Association, KNUST, 2017–2018