Daniel Commey

Ph.D. Candidate (Dissertation Defended), Interdisciplinary Engineering, Texas A&M University
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Research Interests

Areas: Networking and cybersecurity for blockchain, IoT, and cloud/edge systems, with applications in FinTech and healthcare.
Methods: Applied cryptography (e.g., zero-knowledge proofs), federated/decentralized learning, ML for network security, and game-theoretic models for cyber defense.

Teaching Interests

Computer Networks; Network Security; Cybersecurity; Digital Systems; Embedded Systems; Programming in C/C++; Programming in Python; Introduction to Computer Engineering.

Education

Texas A&M University — College Station, TX, USA
Ph.D. in Interdisciplinary Engineering — *Aug. 2022 – May 2026 (Expected)*

- **Dissertation:** *A Layered Security Framework for Blockchain-Based IoT Systems*
- **Defense:** Successfully Defended December 2025
- Advisor: Dr. Garth V. Crosby

Kwame Nkrumah University of Science and Technology — Kumasi, Ghana
Ph.D. Studies in Computer Engineering — *Dec. 2020 – Aug. 2022*

Kwame Nkrumah University of Science and Technology — Kumasi, Ghana
M.Phil. in Computer Engineering — *Sept. 2017 – Nov. 2019*

- Advisor: Dr. Griffith S. Klogo
- Thesis: A Confidentiality-Based Data Classification Framework for Cloud Data Storage

Kumasi Technical University — Kumasi, Ghana
B.Tech. in Accounting with Computing — *Sept. 2017 – Aug. 2019*

- Project: A Cloud Computing Adoption Framework for Financial Service Institutions in Ghana

Kwame Nkrumah University of Science and Technology — Kumasi, Ghana
B.Sc. in Computer Engineering (Honours) — *Sept. 2011 – June 2015*

- Project: Design of an Electronic Business Card Solution using Java (Android) and PHP (CMS Backend)

Teaching Experience

Graduate Assistant Lecturer (GAL) — Aug. 2025 – Present
Texas A&M University — *College Station, TX, USA*

- ESET 315 — Local and Metropolitan Area Networks (Fall 2025); primary instructor for a class of 104 students.

Graduate Teaching Assistant — Aug. 2022 – Aug. 2025
Texas A&M University — *College Station, TX, USA*

- TCMG 308 — Cybersecurity and Digital Ethics (Summer 2023)

- ESET 269 — Embedded Systems Development in C (Fall 2024; Spring 2025)
- Led labs, held office hours, and graded programming assignments and exams for courses in cybersecurity and embedded systems.

Assistant Lecturer Sept. 2020 – Aug. 2022
Ho Technical University *Ho, Ghana*

- CSC 216/BCSC 311 — Computer Organization and Architecture
- BICT 305/ICT 312 — Server/System Administration I
- CSC 122 — Digital Electronics EEE 108 — C Programming
- BEEE 205/BICT 301 — Programming with Python
- CSC 325 — Embedded System Design and Interfacing
- EEE 208/BEEE 214 — Microprocessors and Microcontrollers

Teaching Assistant Sept. 2015 – Aug. 2016
University of Energy and Natural Resources *Sunyani, Ghana*

- Assisted in: Computer Programming, Web Development, Circuit Theory, Basic Electronics, Digital Systems.
- Co-developed materials, conducted tutorials, graded, and held office hours.

Mentoring & Supervision

Supervision of Undergraduate Research Projects Summer 2025
Texas A&M University *College Station, TX, USA*

- Supervised undergraduate student **Brice Ockman** on privacy-preserving federated learning, resulting in the CCNC 2026 workshop paper *"A Unified Lightweight Benchmark for Privacy-Preserving Federated Learning in Cyber-Physical Systems (Fashion-MNIST Case Study)"* accepted to the *IEEE Workshop on 7th Security Trust Privacy for Cyber-Physical Systems (IEEE STP-CPS).*
- Supervised undergraduate students **Uzma Hamid** and **David Sung** on clustered federated learning, culminating in the CCNC 2026 workshop paper *"Resource-Aware Clustered Federated Learning for Industrial Digital Twins: A Reproducible Benchmark on Fashion-MNIST"* accepted to the *Workshop on Industrial Digital Twins and Emerging Technologies: Bridging the Physical and Digital Worlds.*
- Guided students on experimental design, implementation, result analysis, and paper writing, leading to their first peer-reviewed international publications and conference presentations.

Research Experience

Graduate Research Assistant Aug. 2022 – Present
Texas A&M University *College Station, TX, USA*

- Cyber deception, zero-knowledge proofs, and blockchain security.
- PUF-based security for blockchain–IoT systems.
- Federated learning frameworks for secure distributed systems.
- Game-theoretic models for cyber defense optimization.
- Produced multiple journal articles and peer-reviewed conference papers in networking and cybersecurity, including work on blockchain-IoT security, federated learning, and cyber deception.

Internship Experience

IT Intern June 2014 – Aug. 2014
University Information Technology Services (UITS), KNUST *Kumasi, Ghana*

- Performed hardware/software maintenance for university computing systems; provided user support and troubleshooting.
- Installed PC hardware, operating systems, and applications; monitored antivirus and resolved security issues.
- Developed and delivered user training programs.

Publications

Journal Publications

[J7] **Game-Theoretic Analysis of MEV Attacks and Mitigation Strategies in Decentralized Finance**
*B. Appiah, **D. Commey**, W. Bagyl-Bac, L. Adjei, E. Owusu*
Analytics, 2025

[J6] **Blockchain-enabled dynamic honeypot conversion for resource-efficient IoT security**
***D. Commey**, M. Nkoom, S. G. Hounsinou, G. V. Crosby*
Journal of Information Security and Applications, 2025

[J5] **Post-Quantum Secure Blockchain-Based Federated Learning Framework for Healthcare Analytics**
***D. Commey**, S. G. Hounsinou, G. V. Crosby*
IEEE Networking Letters, 2025

[J4] **Secure IoT firmware updates against supply chain attacks**
*B. Appiah, **D. Commey**, I. Osei, B. K. Frimpong, G. Assamah, E. N. A. Hammond*
The Journal of Supercomputing, 2025

[J3] **Enhanced federated learning for secure medical data collaboration**
*B. Appiah, I. Osei, B. K. Frimpong, **D. Commey**, K. Owusu-Agymang, G. Assamah*
Journal of Analytical Science and Technology, 2025

[J2] **Securing Blockchain-Based IoT Systems: A Review**
***D. Commey**, B. Mai, S. G. Hounsinou, G. V. Crosby*
IEEE Access, vol. 12, pp. 98856–98881, 2024

[J1] **Performance Comparison of 3DES, AES, Blowfish and RSA for Dataset Classification and Encryption in Cloud Data Storage**
***D. Commey**, S. Griffith, J. Dzisi*
International Journal of Computer Applications 177(40), 17–22, 2020

Peer-reviewed Conference Publications

[C9] **Federated DDoS Detection with Clustered Quantization-Aware Training Models for IoRT**
***D. Commey**, B. Appiah, B. K. Frimpong, I. Osei, E. N. A. Hammond, G. V. Crosby*
2026 IEEE 23rd Consumer Communications & Networking Conference (CCNC), Las Vegas, NV, USA (to appear)

[C8] **FedSkipTwin: Digital-Twin-Guided Client Skipping for Communication-Efficient Federated Learning**
***D. Commey**, K. Abbad, G. V. Crosby, L. Khoukhi*
2026 IEEE 23rd Consumer Communications & Networking Conference (CCNC), Las Vegas, NV, USA (to appear)

[C7] **A Unified Lightweight Benchmark for Privacy-Preserving Federated Learning in Cyber-Physical Systems (Fashion-MNIST Case Study)**

***D. Commey**, B. Ockman, G. V. Crosby*
IEEE Workshop on 7th Security Trust Privacy for Cyber-Physical Systems (STP-CPS), co-located with 2026 IEEE CCNC (to appear)

[C6] **Resource-Aware Clustered Federated Learning for Industrial Digital Twins: A Reproducible Benchmark on Fashion-MNIST**
***D. Commey**, U. Hamid, D. Sung, G. V. Crosby*
Workshop on Industrial Digital Twins and Emerging Technologies, co-located with 2026 IEEE CCNC (to appear)

[C5] **Robotic Algorithm Service Contracts to Manage and Incentivize Adaptive Behavior**
*S. Mallikarachchi, P. Thammi, **D. Commey**, S. S. Vitharana, M. Chintalapati, I. S. Godage*
2025 7th International Conference on Blockchain Computing and Applications (BCCA), Dubrovnik, Croatia

[C4] **Securing Blockchain-based IoT Systems with Physical Unclonable Functions and Zero-Knowledge Proofs**
***D. Commey**, S. G. Hounsinou, G. V. Crosby*
2024 IEEE 49th Conference on Local Computer Networks (LCN), Normandy, France

[C3] **Securing the Internet of Robotic Things: A Federated Learning Approach**
*M. Nkoom, **D. Commey**, S. G. Hounsinou, G. V. Crosby*
2024 IEEE 49th Conference on Local Computer Networks (LCN), Normandy, France

[C2] **Strategic Deployment of Honeypots in Blockchain-based IoT Systems**
***D. Commey**, S. G. Hounsinou, G. V. Crosby*
2024 IEEE 6th International Conference on AI Circuits and Systems (AICAS), Abu Dhabi, UAE

[C1] **EGAN: Evolutional GAN for Ransomware Evasion**
***D. Commey**, B. Appiah, B. K. Frimpong, I. Osei, E. N. A. Hammond, G. V. Crosby*
2023 IEEE 48th Conference on Local Computer Networks (LCN), Daytona Beach, FL, USA

Preprints and Under Review

[P6] **FedSkipTwin: Digital-Twin-Guided Client Skipping for Communication-Efficient Federated Learning**
***D. Commey**, K. Abbad, G. V. Crosby, L. Khoukhi*
arXiv:2507.13624 [cs.LG], 2025; also accepted at 2026 IEEE CCNC

[P5] **ZKP-FedEval: Verifiable and Privacy-Preserving Federated Evaluation using Zero-Knowledge Proofs**
***D. Commey**, B. Appiah, G. S. Klogo, G. V. Crosby*
arXiv:2507.11649 [cs.LG], 2025

[P4] **A Bayesian Incentive Mechanism for Poison-Resilient Federated Learning**
***D. Commey**, R. A. Sarpong, G. S. Klogo, W. Bagyl-Bac, G. V. Crosby*
arXiv:2507.12439 [cs.LG], 2025

[P3] **Performance Analysis and Deployment Considerations of Post-Quantum Cryptography for Consumer Electronics**
***D. Commey**, B. Appiah, G. S. Klogo, W. Bagyl-Bac, J. D. Gadze*
arXiv:2505.02239 [cs.CR], 2025

[P2] **Pufzin: Secure and Scalable Blockchain-IoT with PUFs and Zero-Knowledge Proofs**
***D. Commey**, S. G. Hounsinou, G. V. Crosby*
SSRN Preprint

[P1] **Securing Health Data on the Blockchain: A Differential Privacy and Federated Learning Framework**
***D. Commey**, S. G. Hounsinou, G. V. Crosby*
arXiv:2405.11580 [cs.CR], 2024

Awards

2025–2026 Multidisciplinary Engineering Scholarship 2025
Texas A&M University

Graduate Student Research and Presentation Travel Award 2024
Texas A&M University

2024–2025 Multidisciplinary Engineering Scholarship 2024
Texas A&M University

IEEE CAS Student Travel Grant 2024
IEEE Circuits and Systems Society

Travel Award - Multidisciplinary Engineering 2024
Texas A&M University

2023–2024 Multidisciplinary Engineering Scholarship 2023
Texas A&M University

Invited Talks & Academic Visits

Invited Talk: "Dynamic Honeypot Conversion in IoT Networks" Oct. 2024
Sorbonne University *Paris, France*

- Presented adaptive cyber deception strategies for IoT security.

Media Coverage

New ransomware attack based on evolutional GAN can evade security measures June 2024
TechXplore

Professional Service

Journal Reviews

Journal Reviewer 2024 – Present
Ad hoc reviewer for international journals in networking and cybersecurity

- **IEEE**: *Internet of Things Journal*, *IEEE Network*, *Transactions on Mobile Computing*
- **Elsevier**: *Computer Networks (COMNET)*, *Computer Communications (COMCOM)*, *Computer Standards & Interfaces*, *Journal of Information Security and Applications*
- **Nature Portfolio**: *Scientific Reports*
- **Springer Nature**: *Discover Applied Sciences*

Committee Service

Judge Mar. 2025
Texas Science & Engineering Fair *Texas, USA*

Judge Mar. 2024
Texas Science & Engineering Fair *Texas, USA*

Judge Feb. 2024
Regional High School Science Bowl *Texas, USA*

Judge Mar. 2023
Texas Science & Engineering Fair *Texas, USA*

Committee Member June – July 2022
Commission for Technical and Vocational Education and Training (CTVET) *Ghana*

- Validation of Occupational Standards for Computer Science.
- Development of Learning Materials and Assessment Instruments.

Committee Member 2021 – 2022
Ho Technical University *Ghana*

- Faculty Academic Board.
- Curriculum Development/Review Committee for B.Tech. Computer Science.

Professional Memberships

IEEE Communications Society (ComSoc) 2021 – Present
Member

IEEE Circuits and Systems Society (CAS) 2022 – Present
Member

IEEE Computer Society 2020 – Present
Member

Institute of Electrical and Electronics Engineers (IEEE) 2020 – Present
Member No.: 94297294

Association for Computing Machinery (ACM) 2023 – Present
Member No.: 4556850

International Information System Security Certification Consortium (ISC)^2 2024 – Present
Member ID: 1908236

Certifications

ISC^2 Certified in Cybersecurity (CC) 2024
International Information System Security Certification Consortium *Certificate ID: 1908236*

- Security Principles; Incident Response; BC/DR; Access Controls; Network Security; Security Operations.

Cisco Certified Network Associate (CCNA) 2012 – 2016
Kwame Nkrumah University of Science and Technology *Kumasi, Ghana*

- Completed: Network Fundamentals; Routing Protocols & Concepts; LAN Switching & Wireless; Accessing the WAN.

Technical Skills

- **Languages**: Python, Java (Android), C/C++, PHP, Solidity, LaTeX
- **Web**: HTML5, CSS3, JavaScript
- **Databases**: MySQL, MongoDB, Microsoft Access
- **Tools/Platforms**: Git, Docker, Ethereum, Hyperledger Fabric, TensorFlow, PyTorch
- **Operating Systems**: Linux, Windows

Workshops & Conferences

IEEE 49th Conference on Local Computer Networks (LCN) Oct. 2024
Presenter *Normandy, France*

6th IEEE International Conference on AI Circuits and Systems (AICAS) Apr. 2024
Presenter *Abu Dhabi, UAE*

IEEE 48th Conference on Local Computer Networks (LCN) Oct. 2023
Presenter *Daytona Beach, FL, USA*

Python for Engineers Workshop Jan. 2022
Attendee *Ho Technical University, Ghana*

Teaching and Assessment Training Workshop Apr. 2021
Attendee *Ho Technical University, Ghana*

IEEE CAS Society Outreach Activity — 2nd African Workshop on Circuits and Systems May 2019
Participant *KNUST, Ghana*

IEEE CAS Society Outreach Activity — 1st African Workshop on Circuits and Systems Nov. 2017
Participant *KNUST, Ghana*