Daniel Commey

Ph.D. (defended Dec 2025; conferral May 2026), Interdisciplinary Engineering, Texas A&M University

✉ dcommey@tamu.edu | 🔗 linkedin.com/in/dcommey | ⭘ github.com/dcommey
ⓘD 0000-0001-5759-918X | 🎓 Google Scholar | 🌐 danielcommey.com

RESEARCH SUMMARY

I work at the intersection of network security and distributed systems, developing layered security frameworks for resource-constrained and decentralized environments. My research integrates applied cryptography (including zero-knowledge proofs), post-quantum security, and measurement-driven system design. I have built and evaluated mechanisms for hardware-rooted device trust in blockchain-IoT (PUFs + ZKPs), adaptive network defense via dynamic honeypot conversion, and post-quantum and verifiable federated learning for healthcare and cross-institution settings. This work has appeared in peer-reviewed venues including *IEEE Networking Letters*, *Journal of Information Security and Applications*, and *Expert Systems with Applications*.

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*
- **Dissertation:** *A Layered Security Framework for Blockchain-Based IoT Systems*
- **Status:** Ph.D. (defended Dec 2025; conferral May 2026).
- Advisor: Dr. Garth V. Crosby

Kwame Nkrumah University of Science and Technology — **Kumasi, Ghana**
Ph.D. Studies in Computer Engineering (Transferred) — *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*

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

TEACHING EXPERIENCE

Instructor of Record (Graduate Assistant Lecturer) — **Aug. 2025 – May 2026**
Texas A&M University — *College Station, TX, USA*
- **ESET 315 — Local and Metropolitan Area Networks (Fall 2025 & Spring 2026):** Instructor of record for **180+ students** across two offerings; developed curriculum, labs, and assessments.

Graduate Teaching Assistant — **Aug. 2022 – Aug. 2025**
Texas A&M University — *College Station, TX, USA*
- **ESET 269 — Embedded Systems Development in C (Fall 2024; Spring 2025):** Led weekly lab sessions on STM32 microcontrollers.
- **TCMG 308 — Cybersecurity and Digital Ethics (Summer 2023):** Managed grading and student support.

Assistant Lecturer — **Sept. 2020 – Aug. 2022**
Ho Technical University — *Ho, Ghana*
- Taught undergraduate courses: Computer Organization & Architecture, Server/System Administration, Digital Electronics, C Programming, Python Programming, Embedded System Design, Microprocessors & Microcontrollers.
- Supervised final year student projects.

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 a peer-reviewed conference paper at IEEE CCNC 2026: *"A Unified Lightweight Benchmark for Privacy-Preserving Federated Learning in Cyber-Physical Systems (Fashion-MNIST Case Study)"*. Brice is first author. (doi:10.1109/CCNC65079.2026.11366332)
- Supervised undergraduate students **Uzma Hamid** and **David Sung** on clustered federated learning, resulting in a peer-reviewed conference paper at IEEE CCNC 2026: *"Resource-Aware Clustered Federated Learning for Industrial Digital Twins: A Reproducible Benchmark on Fashion-MNIST"*. Uzma is first author and David is second author. (doi:10.1109/CCNC65079.2026.11366532)
- Guided students on experimental design, implementation, result analysis, and paper writing, leading to their first international publications and conference presentations.

RESEARCH EXPERIENCE

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

- Designed PUFZIN framework for hardware-rooted blockchain-IoT security using Physical Unclonable Functions and zero-knowledge proofs.
- Developed BHICS framework for dynamic honeypot conversion in IoT networks using machine learning and game theory.
- Implemented post-quantum secure federated learning protocols (PQS-BFL) for healthcare analytics.
- Produced journal articles and peer-reviewed conference papers in blockchain 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.

PUBLICATIONS

Journal Publications

J9 **PQS-BFL: A Post-Quantum Secure Blockchain-Based Federated Learning Framework**
D. Commey, G. V. Crosby
Expert Systems with Applications, 2026 (Article 131449). doi:10.1016/j.eswa.2026.131449

J8 **Quantifying the Impact of TLE Ageing on LEO IoT Link Reliability**
D. Commey, K. Abbad, M. Nkoom, G. S. Klogo, L. Khoukhi, G. V. Crosby
IEEE Networking Letters, 2025. doi:10.1109/LNET.2025.3649595

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. doi:10.3390/analytics4030023

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. doi:10.1016/j.jisa.2025.104109

J5 **Post-Quantum Secure Blockchain-Based Federated Learning Framework for Healthcare Analytics**
D. Commey, S. G. Hounsinou, G. V. Crosby
IEEE Networking Letters, 2025. doi:10.1109/LNET.2025.3563434

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. doi:10.1007/s11227-025-07126-9

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. doi:10.1186/s40543-025-00484-2

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. doi:10.1109/ACCESS.2024.3428490

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, vol. 177, no. 40, pp. 17–22, 2020. doi:10.5120/ijca2020919897

Peer-reviewed Conference Publications

C9 **Federated DDoS Detection with Clustered Quantization-Aware Training Models for IoRT**
*M. Nkoom, **D. Commey**, Y. Alsenani, S. G. Hounsinou, G. V. Crosby*
IEEE Consumer Communications & Networking Conference (CCNC), Las Vegas, NV, USA, 2026, pp. 1–6. doi:10.1109/CCNC65079.2026.11366492

C8 **FedSkipTwin: Digital-Twin-Guided Client Skipping for Communication-Efficient Federated Learning**
***D. Commey**, K. Abbad, L. Khoukhi, G. V. Crosby*
IEEE Consumer Communications & Networking Conference (CCNC), Las Vegas, NV, USA, 2026, pp. 1–4. doi:10.1109/CCNC65079.2026.11366293

C7 **A Unified Lightweight Benchmark for Privacy-Preserving Federated Learning in Cyber-Physical Systems (Fashion-MNIST Case Study)**
*B. Ockman, **D. Commey**, G. V. Crosby*
IEEE Consumer Communications & Networking Conference (CCNC), Las Vegas, NV, USA, 2026, pp. 1–6. doi:10.1109/CCNC65079.2026.11366332

C6 **Resource-Aware Clustered Federated Learning for Industrial Digital Twins: A Reproducible Benchmark on Fashion-MNIST**
*U. Hamid, D. Sung, **D. Commey**, G. V. Crosby*
IEEE Consumer Communications & Networking Conference (CCNC), Las Vegas, NV, USA, 2026, pp. 1–7. doi:10.1109/CCNC65079.2026.11366532

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*
International Conference on Blockchain Computing and Applications (BCCA), Dubrovnik, Croatia, 2025. doi:10.1109/BCCA66705.2025.11229721

C4 **Securing Blockchain-Based IoT Systems with Physical Unclonable Functions and Zero-Knowledge Proofs**
***D. Commey**, S. G. Hounsinou, G. V. Crosby*
IEEE Conference on Local Computer Networks (LCN), Normandy, France, 2024. doi:10.1109/LCN60385.2024.10639679

C3 **Securing the Internet of Robotic Things: A Federated Learning Approach**
*M. Nkoom, **D. Commey**, S. G. Hounsinou, G. V. Crosby*
IEEE Conference on Local Computer Networks (LCN), Normandy, France, 2024. doi:10.1109/LCN60385.2024.10639784

C2 **Strategic Deployment of Honeypots in Blockchain-Based IoT Systems**
***D. Commey**, S. G. Hounsinou, G. V. Crosby*
IEEE International Conference on AI Circuits and Systems (AICAS), Abu Dhabi, UAE, 2024. doi:10.1109/AICAS59952.2024.10595866

C1 **EGAN: Evolutional GAN for Ransomware Evasion**
***D. Commey**, B. Appiah, B. K. Frimpong, I. Osei, E. N. A. Hammond, G. V. Crosby*
IEEE Conference on Local Computer Networks (LCN), Daytona Beach, FL, USA, 2023. doi:10.1109/LCN58197.2023.10223320

Preprints and Under Review

P6 **FedGraph-VASP: Privacy-Preserving Federated Graph Learning with Post-Quantum Security for Cross-Institutional Anti-Money Laundering**
***D. Commey**, M. Nkoom, Y. Alsenani, S. G. Hounsinou, G. V. Crosby*
arXiv:2601.17935 [cs.LG], 2026. arXiv:2601.17935

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. arXiv:2507.11649

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. arXiv:2507.12439

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. doi:10.48550/arXiv.2505.02239

P2 **Pufzin: Secure and Scalable Blockchain-IoT with PUFs and Zero-Knowledge Proofs**
***D. Commey**, S. G. Hounsinou, G. V. Crosby*
SSRN Preprint, 2025. doi:10.2139/ssrn.5099407

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. doi:10.48550/arXiv.2405.11580

AWARDS

Multidisciplinary Engineering Scholarship — 2023–2026
Texas A&M University

Graduate Student Research and Presentation Travel Award — 2024–2025
Texas A&M University

Travel Award — Multidisciplinary Engineering — 2024–2025
Texas A&M University

IEEE CAS Student Travel Grant — 2024
IEEE Circuits and Systems Society

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
- **Elsevier:** *Computer Networks*; *Computer Communications*; *Computer Standards & Interfaces*; *Future Generation Computer Systems*; *Journal of Information Security and Applications*; *Array*.
- **IEEE:** *Internet of Things Journal*; *IEEE Network*; *IEEE Transactions on Mobile Computing*; *IEEE Transactions on Industrial Informatics*.
- **Springer:** *International Journal of Computational Intelligence Systems*; *Cluster Computing*; *Scientific Reports*; *Discover Applied Sciences*.

Outreach & Community Service

Judge — Mar. 2025; 2024; 2023
Texas Science & Engineering Fair

Judge — Feb. 2024
Regional High School Science Bowl

Committee Service

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

Institute of Electrical and Electronics Engineers (IEEE) — 2020 – Present
Member No.: 94297294
- IEEE Communications Society (ComSoc) — 2021–Present
- IEEE Circuits and Systems Society (CAS) — 2022–Present
- IEEE Computer Society — 2020–Present

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) Training — 2012 – 2015
Kwame Nkrumah University of Science and Technology — *Kumasi, Ghana*
- Network Fundamentals; Routing Protocols & Concepts; LAN Switching & Wireless; Accessing the WAN.

TECHNICAL SKILLS

- **Programming:** Python, C/C++, Java, Solidity, LaTeX
- **Security/Crypto:** zero-knowledge proofs, post-quantum cryptography (PQC), threat modeling, incident response
- **ML/FL:** federated learning, privacy-preserving ML, PyTorch, TensorFlow
- **Blockchain/IoT:** Ethereum, Hyperledger Fabric, blockchain-IoT security
- **Tools/Systems:** Git, Docker, Linux, Windows
- **Additional:** MySQL, MongoDB

WORKSHOPS & CONFERENCES

2026 IEEE 23rd Consumer Communications & Networking Conference (CCNC)   **Jan. 2026**
Presenter, Las Vegas, NV, USA

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

Additional workshops/training (attendee/participant)   **2017–2022**
Python for Engineers (2022); Teaching and Assessment Training (2021); IEEE CAS African Workshop on Circuits and Systems (2017, 2019)