

Akor, George Chidera

Research Engineer

Trustworthy AI · smart-contract security · verifiable computation · networked systems

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EDUCATION

Kumoh National Institute of Technology, Gumi-si, South Korea — Ph.D. (incoming)

FROM SEPTEMBER 2026

Doctoral research in the Networked Systems Laboratory (NSL), continuing work on verifiable AI, blockchain auditability and networked systems.

Kumoh National Institute of Technology, Gumi-si, South Korea — Master of Engineering

SEPTEMBER 2024 – AUGUST 2026 (COMPLETED)

Master of Engineering in IT Convergence Engineering. Research-based degree: verifiable AI and blockchain-based auditability for smart-contract security, spanning zero-knowledge machine learning (zkML) and on-chain provenance.

Federal University of Technology, Owerri, Nigeria — B.Eng

NOVEMBER 2016 – JUNE 2023

B.Eng, Electrical and Electronic Engineering (Second Class Honours, Upper Division); majored in Electronics and Computing. Secretary-General, Society of Electrical and Electronic Engineering Students (2019–2021); Team Secretary, Enactus FUTO (2021–2022).

PUBLICATIONS

- [1] D.-S. Kim, I. S. Igboanusi, and **G. C. Akor**. "The Purechain Blockchain Network: Architecture, Performance, and Applications," Blockchain: Research and Applications, June 2026, art. 100508. Elsevier. doi:10.1016/j.bcr.2026.100508
- [2] **G. C. Akor**, L. A. C. Ahakonye, J. M. Lee, and D.-S. Kim. "Benchmarking CNN Components in EZKL: A Layer-Level Analysis for EVM-Compatible Deployment," 2026 Int'l Conf. on Artificial Intelligence in Information and Communication (ICAIIIC), Tokyo, Japan, pp. 645–650. IEEE. doi:10.1109/ICAIIIC68212.2026.11454315
- [3] **G. C. Akor**, L. A. C. Ahakonye, J. M. Lee, and D.-S. Kim. "Towards Quantization-Native Zero-Knowledge Verification for INT4 Large Language Model Inference," 2026 KICS Winter Conference, pp. 911–912. **Outstanding Paper Award (poster)** **DBpia record** · [Full text on ResearchGate](#)
- [4] **G. C. Akor**, L. A. C. Ahakonye, J. M. Lee, and D.-S. Kim. "PureChain-Based Zero-Knowledge Proofs for Verifiable Machine Learning in Industrial IoT," KICS Fall Conference 2025, Gyeongju, South Korea. [Full text on ResearchGate](#)
- [5] **G. C. Akor**, L. A. C. Ahakonye, J. M. Lee, and D.-S. Kim. "ProvAuditChain: A Gas-Efficient On-Chain Provenance Framework for AI-Driven Smart Contract Audits," 2025 16th Int'l Conf. on ICT Convergence (ICTC), Jeju, Korea, pp. 1156–1160. IEEE. doi:10.1109/ICTC66702.2025.11388677
- [6] **G. C. Akor**, L. A. C. Ahakonye, J.-M. Lee, and D.-S. Kim. "Generative Agents for Realistic Mobile Computing and User Behaviour Case," 2025 Int'l Conf. on Mobile, Military, Maritime IT Convergence (ICMIC), Cebu, Philippines, pp. 141–144. IEEE. doi:10.1109/ICMIC66299.2025.11257744
- [7] D.-S. Kim, I. S. Igboanusi, and **G. C. Akor**. "The Purechain Blockchain Network: An Overview," 2025 Int'l Conf. on Mobile, Military, Maritime IT Convergence (ICMIC), Cebu, Philippines, pp. 262–265. IEEE. doi:10.1109/ICMIC66299.2025.11257740
- [8] J. N. Njoku, K. J. Mukisa, O. P. Angelo, **G. C. Akor**, J.-M. Lee, and D.-S. Kim. "BridgeSync: A Digital Twin Framework for Secure and Intelligent Smart Bridge Monitoring," 2025 Sixteenth Int'l Conf. on Ubiquitous and Future Networks (ICUFN), Lisbon, Portugal, pp. 459–464. IEEE. doi:10.1109/ICUFN65838.2025.11169959
- [9] **G. C. Akor**, L. A. C. Ahakonye, J. M. Lee, and D.-S. Kim. "Small Language Model Resilience to AST-Based Obfuscation Attacks on Reentrancy Vulnerability Detection," KICS Summer Conference 2025, Jeju, South Korea. [Full text on ResearchGate](#)

AWARDS

Outstanding Paper Award (poster category)

우수논문상, 2026 KICS Winter Conference (한국통신학회 동계종합학술발표회) — for the INT4 zero-knowledge verification paper, 9B-P-7 (first author). Announced 27 May 2026; one of 29 outstanding papers selected. **KICS award announcement**.

Federal Government Scholar (FSB)

Federal Scholarship Board, Nigeria, 2018.

RESEARCH ARTEFACTS

BENCHMARK AND REPLICATION PACKAGE

EZKL CNN Benchmark — GitHub

Experiment code, raw results and analysis scripts for the layer-level EZKL study: eight layer types at two tolerance settings plus three composite CIFAR-10 CNNs, with the hardware constraints that bounded the runs documented.

FORMALISATION AND REFERENCE IMPLEMENTATION

zk-kzg-auth — GitHub

Lean 4 proofs of completeness, the algebraic foundation of knowledge soundness, and zero-knowledge in an abstract bilinear-pairing model; Rust reference implementation on an arkworks BN254 backend with x86 and ARM latency benchmarks. MIT licensed.

SELF-DIRECTED PROJECTS

Engineering demonstrations, not client deployments and not independently audited.

SMART CONTRACT

ERC-4626 Yield Vault — GitHub

Upgradable ERC-4626 vault using the UUPS proxy pattern, with Foundry unit and invariant tests and Slither static analysis in CI. Never deployed with real funds.

ML / AUTOMATION

LLM Support Agent — GitHub

Retrieval-augmented support assistant built with LangChain, FAISS and FastAPI over a Gemini model, with request logging and response guardrails.

WEB APPLICATION

Multi-Tenant Analytics Dashboard — GitHub

Multi-tenant analytics dashboard in Next.js and TypeScript with a PostgreSQL/Prisma backend and role-based access control.

TECHNICAL SKILLS

Languages: Python, TypeScript/JavaScript, Solidity, Rust, Lean 4 (proof development)

Research tooling: PyTorch, EZKL, Halo2, Foundry, Hardhat, Slither, Git

Systems: EVM and Layer-2 test networks, IPFS, PostgreSQL, Docker

RESEARCH AND PROFESSIONAL EXPERIENCE

Graduate Student Researcher — Networked Systems Laboratory, Kumoh National Institute of Technology

OCTOBER 2024 – PRESENT

Graduate research on automated and verifiable smart-contract auditing.

- Designed, implemented and evaluated **ProvAuditChain**, a hybrid on-chain/off-chain provenance framework for AI-driven audit reports; benchmarked gas, latency and throughput over 600 audit cycles on the Arbitrum Sepolia testnet (first author, ICTC 2025).
- Benchmarked CNN components compiled through **EZKL** layer by layer for proving time, memory and deployment cost (first author, ICAIIC 2026).
- Measured the effect of AST-based identifier renaming on reentrancy detection by 7B-parameter code models over a curated set of 50 Solidity contracts (first author, KICS Summer 2025).
- Contributed to lab research systems including PureChain, PureWallet offline Bitcoin transactions, and **BridgeSync** (co-author, ICUFN 2025).

Independent Engineering Projects — Self-directed, not client engagements

OCTOBER 2021 – PRESENT

Self-directed software work used to build and maintain implementation skill. None of it was commissioned, billed or operated for a third party.

- **Web and application development:** full-stack applications with Next.js (App Router, Server Components), React, TypeScript and Tailwind CSS; REST APIs on Node.js/Express or Python; PostgreSQL and MongoDB schemas.
- **Smart contracts:** Solidity contracts written and tested with Foundry and Hardhat, including unit and invariant tests, Slither static analysis, and deployment to local and public test networks.
- **Machine learning and LLM tooling:** PyTorch models, retrieval-augmented generation pipelines with LangChain, and evaluation harnesses for accuracy, cost and latency.

Technical Writing

OCTOBER 2024 – PRESENT

Preparation and proofreading of documentation, technical reports and research papers.

Service Solutions Engineering Graduate Intern (NYSC) — Huawei Technologies Nigeria Co., Ltd., Lagos

DECEMBER 2023 – SEPTEMBER 2024

Graduate internship: technical support for Huawei telecommunication services; coordinated service projects for on-time delivery; prepared technical documentation and ran knowledge-sharing sessions.

Trainee Engineer — Slot Nigeria, Lagos

MAY 2021 – AUGUST 2021

Slot Academy trainee; practical instruction in smartphone repair and restoration.

Intern — Internhub, Owerri, Nigeria

AUGUST 2018 – OCTOBER 2018

Fundamentals of Java for Android; wrote and tested small apps; object-oriented design and Android architectural components.

Trainee Intern — Prime Media Tech, Lagos

AUGUST 2017 – OCTOBER 2017

Frontend web fundamentals; built replicas of popular sites in HTML, CSS, JavaScript and React.js.