Gideon Adjei

Kumasi, Ghana
+233-59-135-0125 gideonadjei450@gmail.com gideonadjei.site
github.com/k-ojo linkedin.com/in/gideonadjei @gaviviteaches

Research Interests

Computer Architecture, VLSI Design, Embedded Systems, Secure Systems, Operating Systems, Cryptography, Quantum Computing

Education

Kwame Nkrumah University of Science and Technology (KNUST) Jan 2021 – Aug 2024
B.Sc. Computer Engineering GPA: 3.81/4.00

Pope John SHS and Seminary Sept 2017 – Jun 2020
Secondary Education Aggregate: 10

Research Experience & Projects

Cryptographic C Library for Blockchain Jan 2025 – Present
Designed and implemented a modular C library for blockchain primitives, including hashing and digital signatures. Demonstrated its application through a prototype blockchain-based e-voting system, strengthening expertise in cryptography, distributed systems, and system-level security.

PilOS: Custom Operating System Jan 2025 – Present
Developing an x86 operating system with a multiboot-compliant bootloader and protected-mode kernel. Implemented low-level memory management and process handling, laying groundwork for secure and efficient system design while gaining experience with kernel programming and assembly integration.

ARMv7 Assembly Programming Mar 2025 – Present
Wrote assembly routines for arithmetic, memory-mapped I/O, and hardware interaction on ARMv7. Investigated performance tuning and pipeline hazards to better understand instruction-level parallelism, gaining insights into embedded optimization and architecture-aware programming.

USB PHY Design in Verilog Jul 2025 – Present
Designed and simulated a synthesizable USB 1.1 Physical Layer transceiver entirely in Verilog. Implemented NRZI encoding/decoding, bit-stuffing, and sync detection for full protocol compliance, preparing design for FPGA deployment with simulation (ModelSim) and hardware verification.

Software Contributions (C) Dec 2023 – Feb 2024
Built a minimal Unix shell in C with support for process management, piping, redirection, and job control. Implemented a custom `printf` function using variadic arguments, showcasing deep understanding of C internals and strengthening skills in debugging (GDB, Valgrind) and systems programming.

Teaching & Outreach

Teaching Assistant, KNUST Oct 2024 – Present
Conducted weekly lab sessions for 200 undergraduates. Assisted grading, led tutorials, and

implemented learning strategies that improved student performance by 20%.

YouTube Educator (GaviviTeaches) Dec 2024 – Present
Created educational videos on C programming, debugging with GDB, and file handling. Helping beginners understand systems programming concepts and expanding access to low-level programming education.

Publications / Reviews

Gideon Adjei et al. (2024). Review of Homomorphic Encryption. Departmental Research Review, KNUST.

Technical Skills

Programming & Languages: C, C++, Python, Verilog, ARMv7 Assembly, MATLAB
Hardware/Design Tools: Quartus, ModelSim, Oscilloscopes, FPGA synthesis, Cadence Virtuoso
Systems & Tools: Linux, Docker, Git, Make, GDB, Valgrind
Research Methods: Literature review, critical analysis, Python/MATLAB for data analysis

Honors & Awards

MTN Bright Scholarship Award 2023
Awarded to academically outstanding and financially deserving students across Ghana. Covered tuition, accommodation, and stipend.

College of Engineering Excellence Award, KNUST Jun 2022
Awarded to students with a cumulative GPA above 75.00.

HDLBits Global Ranking (Verilog) Mar 2025
Completed all 182 Verilog exercises, mastering digital logic, FSMs, and hierarchical design.

Leadership & Service

Math & Science Club Advisor, Pope John SHS 2019 – 2020
Mentored students in math competitions, science fairs, and STEM workshops, fostering critical thinking and problem-solving.

Professional Memberships

Individual Member, RISC-V International Jun 2025 – Present

Additional Information

Languages: English (Fluent), Akan (Fluent), French (Basic)
Interests: Embedded systems, Systems programming, Football, Mathematical problem-solving

Referees

Available upon request.