George Adu

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Education

Duke University — **Aug 2023 – May 2027**
B.S. in Computer Science; Mathematics & Statistics — *Durham, NC*

Awards: Silver @ USACO; Finalist @ International Youth Math Challenge; Top 10 @ comma.ai Controls Challenge v2
Coursework: Geometric Algorithms, Theory and Algorithms for Machine Learning, Operating Systems, Analysis(Real & Complex), Abstract Algebra, Data Structures, Probability, Computer Architecture

Experience

Software Engineering Intern - Full-Stack — **Jun 2025 – Jul 2025**
Clozure Inc. — *Remote*

- Automated CI/CD with GitHub Actions and Docker, integrating lint/test/build stages; reduced deployment time by 50% and eliminated manual SSH steps.
- Built a responsive counseling service site using TailwindCSS, HTML, and vanilla JS; optimized load performance under poor network conditions with asset prefetching and lazy loading.
- Designed modular REST APIs (Node.js/Express) with JWT-based auth, Redis caching, and MongoDB aggregation pipelines; deployed on Railway with containerized builds.

Software Engineering Intern - AI Engineering — **Jun 2024 – Aug 2024**
Curatle — *Remote*

- Built and tuned semantic vector search for ChatGPT-style API endpoints using OpenAI embeddings and Pinecone, cutting median latency by 45%.
- Developed React/TypeScript dashboard components with reusable hooks and server state via TanStack Query; improved Core Web Vitals by 20%.
- Automated ingestion using Python Cloud Functions with Pub/Sub, backpressure control, and schema validation — achieving 3× throughput with stable error rates.

Software Developer - Machine Learning — **Jan 2024 – Present**
Duke Applied Machine Learning — *Durham, NC*

- Shipped production-grade features for ML workflows involving PyTorch training pipelines and React dashboards.
- Worked on cloud deployments (GCP + Docker) for inference endpoints with autoscaling and structured logging.
- Collaborated on model interpretability tooling (SHAP/LIME) and data processing for real-world datasets.

Teaching Assistant — **Jan 2024 – May 2024**
Duke Computer Science (CompSci 230) — *Durham, NC*

- Reviewed problem sets and proof-based assignments with Prof. Shao Heng Ko; covered topics in discrete math, combinatorics, and logic.

Software Engineering Intern — **Aug 2023 – Present**
Tech Tree Root (501c3 Nonprofit) — *Remote*

- Built internal tools for hybrid hackathons (Ivy Plus, Live Ai) — automated judging, registration, and post-event tracking using Python, Flask, and Google Apps Script.
- Implemented multilingual content workflows supporting Python/JS/Swift curricula; optimized static build times via incremental compilation.
- Containerized internal services, added CI hooks, and reduced hosting costs by 30% via scheduled scaling.

Projects

comma.ai Controls Challenge v2 (Top 10) | *Python, Machine Learning, Covariance Matrix Adaptation-ES*
Developed a custom feedback controller to minimize lateral acceleration error and jerk on real driving data. Implemented custom feedback controller with horizon tuning, cost shaping, and adaptive feedforward. Optimized PID gains with CMA-ES across 20k+ driving segments. Ranked Top 10 globally on the official leaderboard.

LLaMAChess | *JavaScript, Python, FastAPI, llama-cpp-python*
Interactive chess app with local LLaMA-2 for offline board analysis. Backend served FEN queries with FastAPI; frontend built with `chess.js` and `chessboard.js`. Demo Video — GitHub

Segregating Waste for Recycling | *Neural Networks, TensorFlow, Keras, Raspberry Pi*
Developing a CNN-based system to classify and sort waste using Raspberry Pi and OpenCV. Combines ML models with servo motors and sensors to address plastic waste challenges in Ghana. Project Website

Single-Cycle-CPU | *Logisim*
16-bit CPU with 8 registers and custom ISA. Separate clock domains for PC, memory, registers, keyboard, and TTY. Supports arithmetic, memory, branching, and `jal` with $r7$ link register. GitHub

LeafTracker — Plant Toxicity Classifier (In Progress) | *Machine Learning, TensorFlow, Keras, HuggingFace*
Building a CNN image classifier for identifying toxic vs. non-toxic plant species. Experimenting with data augmentation and transfer learning to improve robustness. Prototyping an interactive HuggingFace demo with a lightweight static frontend.

Technical Skills

Languages: C++, Java, C, Python, Rust, TypeScript/JavaScript, SQL, Bash, MIPS
Frameworks/DB: React, Next.js, Node.js, Express, FastAPI, Flask, PostgreSQL, Redis, MongoDB