

RONARD ADU-BOTCHWAY

Backend-Leaning Full-Stack Engineer

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SUMMARY

Software engineer who took a production capital-markets platform from first commit to deployment as the sole engineer, and who has replaced paper record-keeping at Ghana Air Force Headquarters with systems still in daily use. Strongest on backends that ingest unreliable external data and keep it correct: scraping and API integration, scheduled pipelines with gap detection, relational modelling, and the valuation logic on top. Comfortable end to end, from Postgres schema to Next.js UI to the AWS deployment.

TECHNICAL SKILLS

Languages: Python, TypeScript, JavaScript, SQL. Coursework level: C++, Java

Backend: FastAPI, Flask, Express, SQLAlchemy, Prisma, Pydantic, Celery, Unicorn, REST API design

Frontend: Next.js (App Router), React, TypeScript, Tailwind CSS, Recharts, Zustand, SWR, Jinja2

Data: PostgreSQL, pgvector, Redis, SQLite, MySQL, MongoDB, Firebase, schema design and migrations

AI and ML: TensorFlow, Keras, PyTorch, TensorFlow.js, RAG (pgvector, sentence-transformers), Anthropic Claude API, OpenAI, Gemini

Data Acquisition: Playwright, BeautifulSoup, Scrapy, RSS, CSV and PDF parsing, idempotent ingestion

Infrastructure: Docker, AWS EC2, Cloudflare Workers, Nginx, GitHub Actions CI/CD, systemd, NSSM

Testing: pytest, Vitest, Supertest, Jest

EXPERIENCE

Software Engineer, KAN Asset Management

Oct 2025 to Aug 2026

Baobab Capital Markets: financial data and wealth management platform for the Ghanaian capital markets. Accra, remote.

- Sole engineer from first commit to production: 170 of 182 repository commits over 10 months, across a 160-module FastAPI backend, 138 API routes, 21 ORM models, 31 routed Next.js pages and 19 authored SQL migrations.
- Built six ingestion pipelines against four public institutions (Ghana Stock Exchange, Bank of Ghana, GFIM, Ghana Statistical Service) using Playwright, Scrapy, BeautifulSoup, RSS and CSV/PDF parsers, each with its own idempotency strategy, scheduled through Celery and Redis.
- Designed gap detection and backfill so a missed collection window self-heals instead of leaving a silent hole in the price history that every portfolio valuation depends on.
- Built the valuation engine and analytics: near real-time revaluation (5-minute Celery polling during market hours), daily P&L, multi-asset AUM reporting, GSE-benchmarked performance and risk-mismatch alerting, replacing portfolios previously tracked by hand in spreadsheets.
- Shipped Kofi, a retrieval-augmented investment assistant: pgvector similarity search with sentence-transformers embeddings over a 21-document knowledge base at 16/17 retrieval accuracy in testing, behind a guarded prompt, plus a 27-question investor questionnaire run in-conversation that writes structured results to the database and notifies advisors.
- Implemented JWT authentication and three-role RBAC (client, advisor, lead advisor) enforced through FastAPI dependencies, and found and fixed a portfolio-ownership data leak in already-merged code.
- Restored production data flow after an upstream provider silently began dropping AWS egress connections, a hang rather than an error: moved live fetching browser-side to restore data within a day, then tried to restore server-side fetching through an authenticated Cloudflare Worker proxy and a scheduled GitHub Actions relay, both blocked, and finally had the provider whitelist our production IP, making server-side fetching primary again with the browser relay as fallback.
- Re-architected the portfolio data model after launch to support advisor-managed relationships alongside self-service, shipped with a read-only preflight script and an atomic idempotent migration.
- Built a multi-phase partner-integration API consumed by an external institution, covering client provisioning, portfolio reads, lead-advisor assignment and real-time chat.
- Ran deployment and incident response on AWS EC2 behind Nginx and Cloudflare, with GitHub Actions CI enforcing lint, type checks and smoke tests, and failing the build if a tracked .env or private key appears in the repository.
- Ran the pre-build feasibility spikes that set the ingestion architecture: established which sources genuinely needed a headless browser versus cheap static parsing, and that Bank of Ghana forex should come through the daily CSV export, which is what made the production pipelines cheap enough to schedule frequently.

Software Developer, Ghana Air Force Headquarters

Oct 2024 to Nov 2025

National Service Oct 2024 to Sept 2025, then a contract engagement for the Training Directorate to Nov 2025. Accra.

- SkyLog, sole author, 58 commits: replaced the paper flight logbook at GAF Headquarters, still in active use. 16-model PostgreSQL schema mirroring the physical logbook, 74 Flask routes, automatic flight-time computation across day, night, instrument, instructional and simulator categories, an admin verification workflow and print-formatted official reports. Dockerised with operator batch scripts for install, start, stop, status and backup so non-technical staff run it unaided; still receiving feature work in January 2026, after handover.
- AirVault, sole author, 109 commits: personnel and training records system. Normalised four-entity PostgreSQL schema, 84 routes, 14 screens, and a CSV bulk import path robust enough to absorb the unit's existing inconsistent spreadsheets without hand-cleaning every row. Migrated historic paper and spreadsheet records into a queryable system; Docker Compose deployment with versioned SQL dumps as the backup and restore path.
- Training Directorate Management System, 37 of 45 commits: 12-table schema and 81 routes serving four distinct role interfaces off one data model, including an unattended TV display mode, JWT authentication, APScheduler deadline reminders and a full activity audit trail. Delivered with written API and deployment documentation the directorate uses.
- GAFCTS, sole author, 25 commits: officer and course tracking for the Air Secretary's office. 53 routes over psycopg2 and PostgreSQL, five explicit course completion states, real-time client-side search across dual list and card views, PDF and Excel export, CSV bulk import.

Customer Service Representative (Internship), Ecobank Ghana PLC

Oct 2023 to Dec 2023

McCarthy Hill branch, Accra.

- Handled account inquiries, transaction disputes and product questions at the branch counter, resolving complaints and processing service requests through internal banking systems and CRM tools. First exposure to the financial services domain later built on at KAN.

SELECTED PROJECTS

StockAlert (2026) Pharmacy inventory and expiry tracker. React 19 and Vite frontend, Express and Prisma backend. Core is a FEFO dispensing service that validates total availability before any mutation, then deducts across batches inside a Prisma transaction, writing a stock-movement audit row per deduction with user, reason and batch. Four-bucket expiry alerting computed on read, purchase-order lifecycle with partial receipts, barcode scanning through the device camera. Business logic unit-tested directly with Vitest and Supertest rather than only through HTTP.

Dermaid (2024 final year project, browser demo 2026) Nine-class skin condition classifier. MobileNetV2 transfer learning in TensorFlow and Keras, served through Flask. Converted to TensorFlow.js in 2026 and redeployed as a static Hugging Face Space running inference entirely client-side, so no image leaves the user's device. Live at huggingface.co/spaces/Radubotchway/dermaid-demo.

Skin-Tone GAN (2024, research strand) StarGAN multi-domain image-to-image translation in PyTorch, built to attack the skin-tone skew in public dermatology datasets that makes classifiers least reliable for the population Dermaid was built for. Full training stack: dataset loader, generator, discriminator, solver loop, TensorBoard logging and argparse-driven configuration.

TrimQ (2025) Multi-branch barbershop queue management in Flask, designed around walk-ins rather than appointments because that is how Ghanaian shops actually operate. Seven-entity data model, 42 routes, wait-time estimation from configured service durations and live queue depth, printed tickets, a self-refreshing waiting-room display and per-branch revenue reporting.

Flashy (2024, team project) Built the document text-extraction layer covering DOCX, PPT, PPTX, PDF and image OCR, and the flashcard-generation modules putting Google Gemini and OpenAI behind one interface despite differing response shapes.

Flight Track (2024, prototype, superseded) Express, TypeScript and MongoDB flight-logbook prototype with a Next.js frontend. Killed it after establishing that a strongly relational, report-heavy domain fits badly on a document store, and rebuilt on Flask and PostgreSQL. That rebuild became SkyLog and went to production.

EDUCATION

BSc Computer Engineering, Kwame Nkrumah University of Science and Technology (KNUST)

Nov 2024

First Class Honours. Relevant coursework: Data Structures and Algorithms, Database Systems, Software Engineering, Machine Learning, Computer Networks. Final year project: Dermaid, an AI skin condition classifier with a generative augmentation research strand on skin-tone representation.

CERTIFICATIONS AND LEADERSHIP

Certifications: AWS Academy Data Engineering (2024), AWS Academy Cloud Foundations (2024), AWS Academy Introduction to Cloud Semesters 1 and 2, Cisco Network Technician Career Path (2024)

Leadership: President, Gospel Light International Church Campus Ministry, KNUST (Jan to Sept 2024). Led a 20-member team running weekly services and the ministry's social media, raising member engagement through better online communication.