

EMMANUEL KOFI DANQUAH

Backend Engineer · AI Systems | TypeScript · Node.js · Python · PostgreSQL

Budapest, Kunigunda útja 35, 1037 · +36 20 454 6582 · danquah662@gmail.com · [LinkedIn](#) · [GitHub](#) · [Portfolio](#)

PROFILE

Backend engineer specialising in production AI systems — inference pipelines, queue-based architectures and PostgreSQL-backed services in TypeScript and Python. Seven years building software, including 3+ years as the sole engineer behind Mosabi's fintech-edtech platform, owning everything from data model to production operations. Currently deepening this specialisation through an MSc in Computer Science (AI) at ELTE Budapest while delivering AI backend systems on contract.

TECHNICAL SKILLS

Backend & Systems: Node.js (TypeScript), NestJS, Express, Python (FastAPI), REST APIs, microservices, Redis & BullMQ (queues, caching), streaming & batch processing, idempotent job design

Data: PostgreSQL (schema design, indexing, row-level security, pgvector), Firebase/Firestore (Auth, Cloud Functions, Admin SDK, security rules), BigQuery, MongoDB

AI Systems: Batch inference pipelines, background-removal models (InSPyReNet), Claude API (prompt design, structured JSON outputs), embeddings & vector search, two-tier on-device/cloud inference design

Cloud & DevOps: Google Cloud Platform, AWS (EC2, S3, RDS, Lambda, VPC), Docker, Git/GitHub, CI/CD, Debian/Linux

Frontend: React, Next.js 14 (App Router), React Native (Expo), Tailwind CSS, Flutter

Languages: TypeScript / JavaScript, Python, SQL, Java, C#, Dart

WORK EXPERIENCE

Full-Stack Engineer (Sole Engineer) — Mosabi · fintech-edtech · Remote *Mar 2022 – Present*

Full-time 2022 – 2025; ongoing contract engagement alongside MSc studies.

- Sole engineer for the entire platform — owned architecture, backend, frontend and production operations end to end across a Firebase/GCP stack: data model → Cloud Functions API → React + TypeScript partner dashboard used by real business partners.
- Designed a role- and permission-based access system (collaborator roles, permission-filtered navigation) with real-time Firestore listeners — the class of problem Row-Level Security solves in Postgres.
- Built an encrypted offline-data import pipeline: Firebase Auth user provisioning via the Admin SDK, E.164 phone-number normalisation, validation and idempotent writes.
- Led a v1 → v2 Firebase Cloud Functions migration and resolved ESM/CJS module issues in a TypeScript monorepo (pnpm workspaces).
- Built internal admin tooling for safe batch updates of production records, with dry-run mode and live logging to protect real user data.
- Shipped multilingual and audio speech-guide features that improved learning outcomes for low-literacy users by ~70%.

Backend Engineer (Contract / Freelance) — Remote

2025 – Present

- Designed and delivered an AI batch image-processing pipeline for a paying client: processes 1,000+ images per run using Redis-backed queuing, streaming I/O, and Python microservices for AI-driven operations including InSPyReNet background removal.
- Engineered for reliability — retries with backoff, idempotent jobs and concurrency control — across a Node.js orchestration layer and Python inference workers.

Software Engineer — Directorate of Science, Technology & Innovation (DSTI) · Government of Sierra Leone

Jun – Sep 2025

- Helped the team complete and ship the Anti-Corruption Commission's national asset-declaration application — [add: your specific modules / stack contribution].

Mobile / Frontend Developer — Mudupay · Remote (Fulton, MD, USA)

Feb – Mar 2022

- Built and tested React Native payment-app screens with a focus on clean, intuitive UI/UX.

Software Engineering Internships — Sensi Tech Hub · Smart Pay · Freetown

[2019 – 2021]

- Early production experience during undergraduate studies across local fintech and technology teams.

SELECTED PROJECTS (BUILT INDEPENDENTLY, AI-ASSISTED)

Printables SaaS — Canva-style web editor — Next.js 14 · TypeScript · Fabric.js · Claude API

- Full product: canvas editor with custom pen/bézier tools, Puppeteer PDF export via a warm browser pool, and AI template generation on the Claude API with structured JSON outputs.
- Debugged the hard parts myself — canvas coordinate-system bugs, an auto-save infinite loop (fixed via Zustand subscriptions), and z-index stacking contexts (fixed with React portals).

Stylist — AI wardrobe platform (backend in progress) — NestJS · PostgreSQL · pgvector · React Native

- Designed the full system architecture: four backend services, Postgres with pgvector similarity search, row-level security for multi-tenancy, and a two-tier AI inference strategy (on-device Gemma 3n with cloud fallback).

Dilemmaspilllet — Save the Children — Mobile learning game

Oct 2019 – Apr 2020

- Co-created and field-tested an educational mobile game with adolescents in underserved communities.

EDUCATION

MSc Computer Science (AI specialisation) — Eötvös Loránd University (ELTE) · Budapest

- Stipendium Hungaricum Scholarship — selected among top international candidates by the Government of Hungary.

BSc (Hons) Information Technology — Limkokwing University · CGPA 3.88 / 4.0

- Tan Sri Limkokwing Award for Creativity and Innovation (2024).

ACHIEVEMENTS

- Winner, Orange Digital Center Hackathon (2022).
- UNESCO International Hackathon representative (2022) — led a global team building an AI-driven energy-savings calculator.