

Jean Bosco Mugiraneza

Full-Stack Software Engineer · Digital Health

CONTACT

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SKILLS

Languages

TypeScript, JavaScript, Python, SQL, Bash

Back end

Node.js, NestJS, Express, FastAPI, Prisma, BullMQ, REST/OpenAPI, WebSockets (Socket.IO), signed webhooks

Front end

React, Next.js, Tailwind CSS, TanStack Query, Zod, React Hook Form, PWA, i18n

Data

PostgreSQL, MariaDB, Redis/Valkey, S3 object storage

Real-time & AI

LiveKit (WebRTC, recording, agents), Matrix, Whisper speech-to-text, LLM integration (Ollama, llama.cpp), text-to-speech

DevOps

Docker & Compose, Linux, Traefik, Caddy, GitHub Actions (self-hosted runners), Prometheus/Grafana, OpenObserve, Sentry/GlitchTip, k6/Locust, backup & restore drills

Identity & security

Keycloak, OAuth2/OIDC, SAML, MFA & passkeys, RBAC & row-level policies, HMAC request signing, OWASP ASVS, gitleaks/Trivy

Testing & tools

Jest, Vitest, pytest, Playwright, axe (WCAG); Git/GitHub, Figma, Jira, Claude Code

SUMMARY

Software engineer with 6 years of experience building and running national digital health systems in Rwanda. Software Engineer at the Ministry of Health's National Health Intelligence Centre (seconded by UNFPA Rwanda), building eBanguka, the national emergency medical services system, and the national Telehealth Platform, both running countrywide for hundreds of healthcare providers. Part-time, I am Lead Engineer at ETITE Ltd, leading a team of five developers. I work across the stack: NestJS, Next.js and PostgreSQL, queues, real-time video, identity and security, Docker infrastructure and AI speech/LLM services. I write code myself and use AI coding agents (Claude Code) behind tests and CI gates. Ministry of Health Best Employee of the Year 2025–2026.

EXPERIENCE

Software Engineer

Feb 2025 – Present

Rwanda Ministry of Health, National Health Intelligence Centre (seconded by UNFPA Rwanda)

Kigali · team of three developers

Full-time role, joined after my ETITE team won the Ministry's telehealth hackathon. Build and maintain national health systems that run countrywide, supporting hundreds of healthcare providers and serving thousands of patients.

eBanguka, national emergency medical services system · NestJS, Prisma, PostgreSQL, Socket.IO, Next.js, Leaflet/Google Maps

- Created the API and web codebases and wrote ~60% of the code (860+ merged pull requests): emergency call intake and ambulance dispatch, crew shifts with geofenced check-in, clinical patient-care records and national reporting.
- Moved national bulk exports to a PostgreSQL job queue (SKIP LOCKED) with a dedicated worker streaming to object storage; a 214-column export dropped from 36–51 s to 21 s and no longer loads the API.
- Ran a data-integrity programme on response-time data: ~25 targeted fixes, an anomaly detector and repair scripts that record the source of every correction, so national response-time reports can be trusted.
- Built facility-scoped access control from a generated permission matrix, patient-data masking, and partner integrations (insurance eligibility, national ID lookup, health information exchange).

MoH video-call platform & AI service · NestJS 11, Prisma 7, BullMQ, LiveKit, Next.js 16, Python/FastAPI

- Designed and built a multi-tenant video consultation platform on LiveKit (rooms, recording, live streaming, HMAC-signed webhooks), exposed through a versioned OpenAPI contract and an npm-published embed SDK; it powers telemedicine for Rwanda Virtual Hospital.
- Load-tested the telemedicine pilot and wrote its capacity model: 60 concurrent one-to-one video consultations on 1.49 vCPU with 0.01% packet loss, and server sizing for 100–500 concurrent patients.

EDUCATION

Advanced Diploma in ICT (Information Technology)

Second Class Upper Division ·
Rwanda Polytechnic – IPRC Kigali ·
2021–2023 (conferred 2026)

National TVET Certificate V, Automobile Electricity & Electronics Systems

IPRC Karongi · 2017–2019 · ranked
first in class each year

CERTIFICATIONS

- Google IT Support Professional Certificate (2025)
- IBM: Linux Commands & Shell Scripting (2025)
- IBM: Agile Development & Scrum (2025)
- IBM: Git & GitHub Essentials (2025)
- freeCodeCamp: JavaScript Algorithms & Data Structures (2023)
- Andela Technical Leadership Program (2023)

LANGUAGES

- Kinyarwanda (native)
- English (fluent, professional level)

LIVE PRODUCTS

eBanguka, national EMS
ebanguka.moh.gov.rw

National Telehealth Platform
telehealth.moh.gov.rw

MoH Events
events.moh.gov.rw

ETITE Meet video platform
meet.etite.tech

Meet embed SDK on npm
[@etiteltd/meet-embed](https://www.npmjs.com/package/@etiteltd/meet-embed)

ETITE Developer Portal
developers.etite.tech

- Built an AI service for live captions, consultation summaries and a voice assistant with Kinyarwanda support, now in pilot validation. Benchmarks showed the configured speech model would miss the 20-minute processing target, so I switched to one that transcribes an hour of audio in ~6.5 minutes on CPU.

Telehealth Platform, MoH Tracker, MoH Events

- Built clinical workflows for the national Telehealth Platform (appointments, teleconsultations, prescriptions, exam results, statistics dashboards) and rebuilt its v2 back end in NestJS with permission-based authorisation.
- Wrote the V2 architecture for MoH Tracker (multiple organisations, RBAC, audit log, row-level policies) and shipped its foundations with a tenant-isolation test suite; built QR-coded badges and invitations for MoH Events.
- Presented NHIC dashboards built on data from these systems; supported the deployment of robots in Rwanda's Marburg virus outbreak response.

Lead Engineer

Oct 2020 – Present

ETITE Ltd

Kigali · team leader of five developers · full-time until Jan 2025, part-time (evenings & weekends) since Feb 2025

- Led delivery of client systems: the RITCO management information system (HR & leave, stock, garage), Woodhabitat ERP, the OAZIS learning platform and an HR platform. Designed the UX in Figma, broke work into tasks for the team, tested every feature and ran client feedback cycles.
- Built ETITE's product suite (2026): single sign-on for 35 applications on Keycloak (MFA by default, passkeys; 837 automated checks; 24 sign-ins/s at p95 73 ms in load tests), a multi-tenant ERP on ERPNext v16 (~900 automated tests) and a Matrix-based chat (2.9 KB embeddable widget; p50 69 ms delivery with 200 users online).
- Run a five-server Docker production fleet (~95 containers): Traefik edge, private image registry, self-hosted CI runners, central logs, metrics and error tracking, and encrypted off-site backups with restore drills measured under 50 s.
- Set the engineering practice: architecture decision records, contract-first APIs with CI drift checks, one ticket per pull request behind test gates. Across ETITE and MoH work I have authored ~3,000 pull requests since 2023 (99% merged).

Software Engineering Intern

Dec 2022 – Oct 2023

Andela (Andela Technical Leadership Program)

Kigali

- Built e-commerce back-end and front-end features in a distributed agile team (Express, Sequelize, JWT/OAuth, Socket.IO; React, Redux Toolkit) with Jest/Vitest tests and CircleCI.

AWARDS

Best Employee of the Year 2025–2026

Rwanda Ministry of Health · moh.gov.rw/about/overview

Overall Winner (\$8,000), Telehealth Digital Tool Development Hackathon

Ministry of Health & RBC with UNFPA and HDI, Kigali, Aug 2024 (team of three); led to my UNFPA-funded role at the Ministry

Certificate of Merit & Higher Education Scholarship

Rwanda Ministry of Education, 2019, for TABARA, an embedded emergency system linking patients to doctors