

Damour Nsanzimfura

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AI & Digital Health Engineer with MS in Engineering AI and hands-on experience building DHIS2-based health information systems, AI-enabled clinical tools, and data-governance frameworks for public health. Currently AI & Emerging Technology Lead at **HISP Rwanda**, where I integrate machine learning, LLMs, and predictive modeling into DHIS2-powered platforms used by the Ministry of Health, Rwanda Biomedical Centre, and community health workers. Previously worked at the Government of Rwanda on national data and AI policy as a Data governance Fellow at Cenfri, and led federated-learning research on neonatal health at CMU's CyLab Africa. Comfortable across the full stack – from privacy-preserving Edge LLMs - data pipelines to mobile CHW tooling and cloud deployment.

Education

MSc in Engineering Artificial Intelligence

May 2025

Carnegie Mellon University

- **Relevant Coursework:** Applied Machine Learning, AI System Design, Big Data, Cloud Computing, Product Management

BSc in Robotics

2017 – 2022

Vladimir State University

- **Relevant Coursework:** Data Structures, C++, Lisp, Control Systems
- Graduated with First Class Honors (3.7/4.0 GPA)

Work Experience

HISP Rwanda

Kigali, Rwanda

AI & Emerging Technology Lead

May 2026 – Present

- Lead AI and emerging-technology workstreams across HISP Rwanda's DHIS2-based digital health portfolio, working alongside the Ministry of Health and Rwanda Biomedical Centre on national HMIS, immunization microplanning, and the eVLMIS vaccine logistics platform.
- Design AI/ML and LLM integrations on top of DHIS2 – including predictive models for climate-sensitive diseases, RAG-based assistants for health workers, and analytics dashboards that surface actionable insights from routine HMIS data.
- Architect digital tooling for **Community Health Workers (CHWs)**, focusing on offline-first mobile data capture, decision-support prompts, and tight interoperability with DHIS2 Tracker programs.
- Champion data quality, interoperability (FHIR/HL7, ADX), and privacy-by-design across health-data products, ensuring alignment with Rwanda's national data protection law and WHO digital health guidelines.
- **Stack:** DHIS2 (apps, Tracker, Web API), Python, TypeScript/React, FastAPI, OpenAI/Mistral, LangChain, PostgreSQL, Docker, AWS.

Cenfri

Kigali, Rwanda

Data Science Fellow (Technical Adviser, Government of Rwanda)

Jul 2025 – May 2026

- Embedded as Technical Adviser to the Rwanda Ministry of Infrastructure and contributed to amendments of Rwanda's national **data and AI policy**, helping shape governance standards adopted across multiple line ministries.
- Designed and rolled out cross-departmental data-element standardization, improving accuracy of national reporting by 35% and reducing data-related compliance risks by 50%.
- Built privacy-preserving RAG prototypes for internal ministry knowledge bases, balancing accessibility with strict data protection requirements.
- **Skills:** Data governance & policy, GDPR/Rwanda DPL compliance, stakeholder facilitation, RAG.

Wekraft Ltd

Kigali, Rwanda

AI Engineer / Technical Advisor

Jul 2024 – Apr 2026

- Architected and led end-to-end delivery of **SkillSeed**, an AI-powered learning platform, as in-house Technical Advisor from scoping through go-live.
- Implemented a resilient microservices architecture (NestJS, MongoDB, React) with OpenAI-powered recommendation logic, deployed on AWS with Docker and CI/CD.
- Partnered with private schools and MINEDUC to translate user needs into a shippable product using Agile/Scrum.
- **Skills:** NestJS, MongoDB, React, OpenAI API, Flutterwave, Docker, AWS, Agile/Scrum.

Upanzi Network, CyLab Africa (CMU)

Machine Learning Engineer

Kigali, Rwanda

Jul 2023 – Dec 2024

- Led **HumekaFL**, a multi-institution federated-learning research project for neonatal asphyxia detection, partnering with hospitals across Africa to keep patient data on-site.
- Built an end-to-end audio data pipeline over the Baby Chillanto Infant Cry database (1,049 healthy / 879 deaf / 340 asphyxiated recordings) using Apache Spark and Python for noise reduction and MFCC/spectral feature extraction.
- Trained a ResNet-50 CNN classifier in PyTorch reaching **96% accuracy**, and deployed it on AWS SageMaker for reproducible serving.
- **Skills:** PyTorch, TensorFlow, Federated Learning, Flask, Docker, Secure Aggregation, AWS SageMaker.

KreditPlus (via Upwork)

Full Stack Developer

Jakarta, Indonesia

Jan 2022 – Apr 2023

- Shipped payment, deeplink-marketing, and recurring-installment features for the KreditPlus mobile app, lifting on-time installment payments by 15% and in-app engagement by 13%.
- Centralized the company CMS end-to-end and integrated PPOB & payment-by-agreement flows.

Skills

- **Digital Health & Health Informatics:** DHIS2 (Apps, Tracker, Web API, Data Visualizer), HMIS design, CHW & mHealth tooling, OpenHIE patterns, Electronic Health Records (EHR), WHO SMART Guidelines awareness.
- **AI / ML:** PyTorch, TensorFlow, scikit-learn, LangChain, RAG, OpenAI & Mistral APIs, federated learning, edge / privacy-preserving inference.
- **Programming:** Python, JavaScript / TypeScript (Node.js, NestJS, React), SQL, Go (familiar), Java, C/C++.
- **Data & Backend:** PostgreSQL, MongoDB, Apache Spark, FastAPI, Flask, Django/DRF, REST & JSON APIs, Airflow (familiar), dbt (familiar).
- **Cloud, DevOps & Tooling:** AWS (Lambda, S3, EC2, SageMaker), Docker, Kubernetes (familiar), Terraform (familiar), CI/CD with GitHub Actions, Heroku.
- **Data Governance:** Enterprise data strategy, data quality & metadata management, GDPR / Rwanda DPL compliance, data governance platforms (AWS Glue, Collibra-style frameworks).
- **Languages:** English (fluent), French (working), Kinyarwanda (native), Russian (working).

Selected Projects

Edge LLM Framework for Secure EHR Interaction

github.com/nsarob/pat-ai

- Built a **privacy-preserving RAG framework** (Mistral + Chroma DB) for local, on-device interaction with Electronic Health Records – designed for low-connectivity clinical settings.
- Achieved strong alignment between retrieved answers and ground-truth EHR responses (high precision/recall/F1) while keeping all PHI on-device.
- **Stack:** LangChain, Mistral, Chroma DB, Docker, RAG.

Federated Neonatal Asphyxia Detection (HumekaFL)

arxiv.org/abs/2412.01167

- Designed a **Federated SVM** pipeline for early detection of birth asphyxia from infant-cry audio, enabling multi-hospital collaboration without moving patient data.
- Tuned communication protocols and aggregation to keep accuracy competitive with the centralized baseline.
- **Stack:** PyTorch, Federated Learning, MFCC/spectral features, AWS SageMaker.

Agentic Farm Monitoring System

[github.com/gigwegbe/...](https://github.com/gigwegbe/)

- Built an **agentic natural-language interface** over IoT/SCADA sensors so non-technical operators can query and control farm equipment in plain language.
- Hit **90–100% task-completion accuracy** across the tested operations.
- **Stack:** Python, FastAPI, LangChain, MQTT, Edge AI.

SkillSeed – AI Learning Platform

wekraft.co

- AI-powered platform helping learners (ages 6–18) discover passions and build future-ready skills through personalized learning paths.
- OpenAI-driven recommendation logic on a NestJS + MongoDB microservices backend.

Achievements & Awards

- AWS All Builders Welcome Grant Recipient – AWS re:Invent 2025, Las Vegas.
- 8+ AWS Cloud badges on Credly (Cloud Practitioner, Solutions Architect, AI/ML, and more).
- First Class Honorary Award – Vladimir State University.
- 2nd Runner-Up – Rwanda CyberStars CTF, 2020.