

Emmanuel Idoko

emmanuel.idoko@gmail.com

<https://www.linkedin.com/in/emmanuelidoko>

<https://github.com/pidox>

Education

University of Lagos

2021 – 2027

Bachelor of Science in Computer Science, **CGPA:** 4.68/5.0

Lagos, NG

Relevant CourseWork: Discrete Mathematics, Discrete and Data Structures, Computational Methods, Linear Algebra, Algebra and Coordinate Geometry, Mathematical Methods, Calculus, Python Programming, C programming, Net Centric Computing, Algorithm and Complexity, Compiler Construction, Concurrent Programming, Operations Research Techniques, Analysis and Design of Digital Systems, Systems Analysis and Design, Operating Systems, Machine and Assembly Language

Udacity

October 2022 – Jan 2024

AI Programming with Python Nanodegree

Remote

Publications & Ongoing Projects

Cross-Modality Attention Fusion for Chest X-ray Diagnosis

(Ongoing)

- Research Objective: To investigate whether fusing features from chest X-ray images and corresponding textual radiology reports can improve diagnostic accuracy.
- Methodology: Designing a cross-attention transformer model to learn joint representations of visual and textual data, exploring its effectiveness in identifying subtle pathologies missed by image-only models.

VAMAE—Vessel-Aware Masked Autoencoders for OCT-Angiography

(Ongoing)

- Research Objective: To develop a self-supervised pre-training method for OCT-A image analysis that learns robust representations of retinal vasculature.
- Methodology: Proposing a masked autoencoder (MAE) variant with a vessel-aware loss function that prioritizes the reconstruction of fine vascular structures, aiming to improve performance on downstream tasks like vessel segmentation and disease classification with limited labeled data.

SharpXR: Structure-Aware Denoising for Pediatric Chest X-Rays

MIRASOL 2025 Workshop (Accepted)

- Proposed and evaluated a structure-preserving denoising method for noisy pediatric chest X-rays.
- Demonstrated improved classification accuracy when denoised images were used for pneumonia detection.

Research Experience

AidCare

May 2025 – Present

AI Research Lead & Co-Founder

Lagos, Nigeria · Hybrid

- Architected a dual-mode Retrieval-Augmented Generation (RAG) system** to provide context-aware clinical decision support, leveraging distinct knowledge bases for physicians and community health workers.
- Engineered a semantic search pipeline using Sentence Transformers and FAISS** to index and query a heterogeneous corpus of medical textbooks and Nigerian national guidelines.
- Developed a multi-stage LLM prompting framework (Google Gemini)** for grounded reasoning, enabling the synthesis of patient data with retrieved knowledge to generate differential diagnoses and actionable recommendations.
- Designed a multi-modal data ingestion pipeline** integrating local **Whisper AI** for transcription and **Tesseract OCR** for patient document processing, enabling the system to reason over conversational and historical data.

Independent Researcher

September 2024 – Present

Machine learning and AI · Researcher

Lagos, Nigeria · Hybrid

- Engaged in weekly critical analysis and presentation of seminal and contemporary research papers in machine learning, with a focus on medical imaging and clinical NLP.
- Collaborated within focus groups to identify open research questions, formulate novel hypotheses, and design experimental protocols for computer vision research projects.

Wema Bank

May 2024 – Present

Data and AI · Internship

Lagos, Nigeria · Hybrid

- Researched and built a governance-compliant pipeline to extract and analyze Play Store reviews, producing actionable insights for product teams.
- Worked through the development of an AI-powered knowledge chatbot for Microsoft Teams, enabling 2000+ staff to instantly access product and process information, reducing support query time.

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Engineering Experience

HabariPay - GTCO

April 2025 – June 2025

Software Engineer · Internship

Lagos, Nigeria · Hybrid

- Built a full-stack vendor guide app (**Next.js**, **Node.js**, **PostgreSQL**) for a food festival, used by **260+** attendees and generating **2,100+** page views.
- Automated ingestion of vendor data from 2 sources into a centralized **SQLite DB**, processing hundreds of records with high consistency.
- Implemented a **TF-IDF**-based recommendation engine and **Gemini**-powered summaries, improving user click-through rate by **7%**.

NexaScale

February 2023 – May 2023

Cloud Engineer · Internship

Lagos, Nigeria · Remote

- Automated deployment of **30+** AWS resources with Terraform, reducing manual setup by 75%.
- Developed a microservice-based application with **Node.js**, containerized with **Docker**, and deployed to production with **Kubernetes (AKS)**.
- Streamlined deployments with a **CI/CD** pipeline (**Azure DevOps**, **Git**, **Docker**) for fast and reliable releases.

ZuriChat

July 2021 – October 2021

Software Engineer & Lead · Internship

Lagos, Nigeria · Remote

- Led a team to ship real-time music and chess rooms using **WebRTC**, boosting user engagement by 20%.
- Improved backend performance by 50% through caching, code refactoring, and API optimization.
- Managed multi-team deployments with **GitHub Actions** and **Jenkins**, ensuring stable integrations across features.

Projects

PheraCAM (*Python, React.js, Azure, OpenAI API*) [Demo](#)– Developed a real-time face recognition system leveraging **OpenCV** and **Azure** cloud services for scalable, low-latency processing. Achieved **>95%** recognition accuracy with **<150ms** response time. This project won 2nd place among 50+ teams at [Hacklab's Hackathon](#), recognized for technical innovation and robustness.

Technical Skills

Languages: Python, JavaScript/TypeScript, SQL, C, Bash, C

ML & Imaging: PyTorch, Hugging Face (Transformers, Sentence Transformers), Scikit-learn, FAISS, Pandas, NumPy

Frameworks: FastAPI, Flask, Node.js, Next.js, Docker, PostgreSQL, MongoDB, DigitalOcean, Git, Linux

Scholarships | Awards | Certifications | Achievements | Community Engagements

Presented a research poster on my accepted paper, “[SharpXR: Structure-Aware Denoising for Pediatric Chest X-Rays](#),” at the Machine Intelligence Research Group International Conference [MIRG-ICAIR](#) 2025.

Project Lead, Unilag Data Community

April 2024 – June 2025

- Developed and delivered a comprehensive workshop series curriculum covering Python, SQL, Power BI, and Excel, successfully training over 250+ students, resulting in a high average skills improvement rate.
- Mentored beginner and intermediate members, providing guidance on project scoping, methodology, and technical implementation.

Deputy Trainings & Competitions Lead, Google Developer Student Clubs

December 2024 – Present

(GDSC) - UNILAG

- Coordinated and facilitated internal hackathons and competitions, fostering a culture of innovation and practical problem-solving among students.
- Designed and led technical training sessions, hands-on workshops, and competitive programs.

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Jim Ovia Undergraduate Scholarship, 2025–2027 — National scholarship recognizing top performance in STEM disciplines.

Squad Hackademy Undergraduate Scholarship, 2024–2027 — National scholarship recognizing top performance in STEM disciplines and programming.

PICFI Undergraduate Scholarship, 2025–2027 — National scholarship recognizing top performance in STEM disciplines.