Jeffrey Otoibhi

AI Researcher | Engineer | MD

AI Researcher dedicated to building culturally-aware, multilingual AI to address disparities in healthcare and language technology. Proven experience leading the development of foundational models for low-resource languages, such as SabiYarn, Nigeria's first indigenous language model. Skilled in the end-to-end lifecycle of LLMs including RLHF to create trustworthy and compliant systems. Eager to advance robust, scalable, and ethically-responsible AI that serves underrepresented communities.

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Assets

AI Research & Development

ML System Design

MLOps

Mathematics For AI

Professional Affiliations

Masakhane

Datascience Nigeria

Igbo AI

Grants

ML Collective Compute Grant
Awarded for SabiYarn-125M development.

Social networks

pauljeffrey

jeffreypaul

jeffreypaul

Languages

English

Work experience

Omali — **Nigeria**
Head of Data Science — Since January 2025

- Responsible for designing and evaluating an AI-powered dermatology diagnostic system tailored to analyze skin images and handle workflows, providing:
  - Diagnosis of dermatological conditions and possible home remedies.
  - scheduling appointments and handling payment systems

Aletheia — **Lagos**
Chief AI Scientist-SabiYarn-125M LM — Since November 2023

- Led the development of Nigeria's first decoder-only foundational language model supporting multiple Nigerian languages **(Train loss- 2.5, Val loss-2.86)**.
- Outperformed GPT-4 by 48% and LLaMA2-13B by 259% on Nigerian language benchmarks for downstream tasks.

Freelance (Contract) — **Remote**
AI Engineer — From September 2019 to January 2025

- **RAG-Powered Customer Support Chatbot**
  - Built a GPT4All-based chatbot with Retrieval Augmented Generation (RAG), enhancing response relevance and accuracy by 30% while resolving 10% of inquiries in real-time, reducing support tickets.
- **SignSynth: AI-Powered Pose-to-Sign Language Translator**
  - Built a transformer-based pose sequence generator and a U-Net-based model for translating pose vectors into sign language images. MAE: 0.04, SSIM: 0.9478.
- **Brazilian BERT-Based Appliance Repair Assistant**
  - Created, integrated a BERT-based system for appliance repair recommendations, reducing human support needs and improving first-time fix rates, integrated via a scalable REST API.
- **AI-Driven Traffic and Accident Event Analysis Engine**
  - Using ResNet-based video segmentation, CNN-LSTM, VideoViT, and LLMs for accident classification, weather analysis, and accident narrative generation, improving baseline accuracy by 15%.

Freelance (Contract) — **Remote**
AI Researcher — From September 2019 to January 2025

- **Multi-Modal Clinical Depression Detection Model (DAIC-WOZ dataset)**
  - Accuracy: 82%, Precision: 0.69, Recall: 0.7, F1-score: 0.63.
- **Prediction of Visual Neuronal Responses to Excitable Images (Macaque v4)**
  - Designed CNN Core + attention readout model. Correlation score-0.27.
- **Automatic Post-Edit (APE) Translator with Real-time Adaptation**
  - Designed and trained APE model. BLEU-4 -0.43 , TER-0.66.
- **Arabic Offensive and Hate Speech Classification**
  - Designed and trained a custom MARBERT based model achieving 94.6% accuracy for offensive speech and 97.4% for hate speech.
- **Adversarial Network Packet Generation for Security Vulnerability Testing**
  - Developed a novel LSTM-based model to generate 350,000 unique adversarial network packets (IP + TCP) for proactive security vulnerability testing.

Sienna Analytics Consulting — **Lagos**
AI Engineer, LLM & Generative AI — From October 2023 to February 2024

- Designed, developed and deployed advanced AI chatbot systems seamlessly integrating them into the business applications for 4 clients.
- Employed strategic prompt engineering approaches improving AI responses (correctness and hallucinations) by 25%.

Interests

AI Research

Health AI

Explainable AI

Biomedical Engineering

Robotics

AI in Finance

Education

College of Medicine, University Of Lagos, — **Nigeria**
MBBS — From November 2011 to July 2018

Certifications

Deep Learning Specialization - Andrew Ng (2022)

Google TensorFlow Developer (2022)

Tech Stack/Skills

AI

- **AI Safety:** RLHF, Explainable AI, adversarial robustness.
- **Programming:** Python, Javascript, Typescript.
- **Libraries & Frameworks:** Pytorch, Tensorflow, Numpy,pydantic ai, Langchain, Scikit-learn, OpenCV, Deepspeed, Ultralytics, Mediapipe, transformers, peft, accelerate, pydub, librosa, pydantic.
- **Tools & Platforms:** MLflow, Docker, Git, AWS, Fastapi.
- **Data Engineering:** Pyspark, Hadoop.
- **Database:** MongoDB, Postgresql, Redis.

Research Publications

SabiYarn-125M: Advancing Low Resource Languages with Multitask NLP Pretraining

- Otoibhi, J., Damilola, O., & David, O. (2025). SabiYarn: Advancing Low Resource Languages with Multitask NLP Pretraining. *Proceedings of the Sixth Workshop on AfricaNLP 2025* (pp. 95-107). Association for Computational Linguistics.

Research contributions

Adapting Large Language Models for Collaborative Semantic Recommendations

- Modified original implementation to support unique user index generation.

Evaluating Bias in Large Language Models For African Languages

- Language bias in LLMs, comparing metrics between African, English and European texts.

PEPLER with reparameterization for explainable recommendations

- Integration of reparameterization to PEPLER's implementation **(DIV-3.55, FCR-0.11, BLEU-4 0.8197)**

JHU++ Image Crowd Counting (open source paper implementation)

- Implemented a confidence-guided deep residual crowd counting model using PyTorch (from paper).

Alzheimer's disease diagnosis

- Using patient speech analysis and Brain MRI scans

Personal projects

Hapi AI (In Progress)

- An AI-enhanced robotic system to digitize paper-based medical health records using research-backed OCR technology.

Ottobiz For Automated Sales

- a horizontal service that automates marketing, sales and customer support.

Music Genre and Instrument Classification

- Developed and trained models for music genre and music instrument classification, using audio denoising, feature engineering and analysis.

MelNet Implementation for Audio Generation

- An LSTM (bi-directional) based model Implemented in TensorFlow directly from its research paper, designed for generating high-fidelity audio from mel-spectrograms.

AI-Powered Drug Information Retrieval system

- Using BERT **Precision**-0.90, **Recall**- 0.88, **F1 score** - 0.89, **Acc** - 0.93

ECG Anomaly detection Using AutoEncoders

- **Val loss**-0.03, **test accuracy** - 0.942, **Precision** - 0.99 , **Recall** - 0.9