

# OLUFEMI VICTOR TOLULOPE

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## PROFESSIONAL SUMMARY

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Innovative Data Scientist with strong expertise in **Natural Language Processing (NLP)**, **Machine Learning (ML)**, and **Large Language Models (LLMs)**. Over five years of hands-on experience in building AI pipelines, fine-tuning open-source LLMs, and deploying production-ready data solutions. Proven ability to tackle complex problems in **Natural Language processing**, **Speech Processing**, and **information retrieval**. Adept at collaborative problem-solving, stakeholder communication, and delivering solutions that drive real-world impact.

## KEY SKILLS & TOOLS

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- **NLP & LLMs:** GPT (fine-tuning & prompt engineering), BERT, Spacy, NLTK, Transformers (Hugging Face), Sentence-Transformers, LangGraph, LangChain, ChromaDB
- **Machine Learning Frameworks:** PyTorch, TensorFlow, scikit-learn
- **Data Processing & Analytics:** Summarization, Entity Recognition, Classification, Clustering, Topic Modeling, Language Generation
- **Programming & DevOps:** Python, C++, SQL, Git (version control), Docker
- **Architecture & Cloud:** Microservices, AWS, Google Cloud Platform, Azure
- **Software Engineering Practices:** Test-Driven Development (TDD), Agile, CI/CD
- **Data & Model Monitoring:** Weights & Biases (W&B), MLflow, Grafana, Mixpanel
- **Data Storytelling & Visualization:** Power BI, Matplotlib, Seaborn, Jupyter Notebooks

## EMPLOYMENT EXPERIENCE

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### AI Researcher

Lyngual Labs | December 2024 – Present

- Co-lead the research and development of **AI models for low-resource and code-switched African languages**, including **Automatic Speech Recognition (ASR)**, **Text-to-Speech (TTS)**, and **Language Identification (LID)**.
- Publish technical findings and contribute to academic research papers.

### Course Facilitator

Robotics and Artificial Intelligence Nigeria | Mar 2024 – Feb 2025 | Hybrid

- Teach and mentor students on Machine Learning, **Deep Learning and NLP**,
- Lead design thinking sessions, code reviews, and debugging across AI and robotics projects.
- Deliver administrative tasks, course scheduling, and alignment with university-level AI/ML curricula.

### AI Engineer

Five-Whys, Singapore | Dec 2023 – Jul 2024 | Remote

- Built **custom LLM pipelines** end-to-end (data curation → fine-tuning → inference → evaluation) for real-time question-answering (chatbots).
- Implemented **prompt engineering** and guardrails to ensure safe deployment of LLM solutions.
- Integrated **multi-model (LLMs)** support into “Glucose,” enhancing real-time analytics and proactive strategy recommendations.

## Data Scientist

### Farmz2u | January 2022 – Oct 2022 | Remote

- Oversaw user analytics and data tracking across social media and search engines, refining engagement strategies.
- Implemented interactive KPIs and dashboards, enhancing productivity monitoring.
- Leveraged data insights to drive informed decision-making and continuous organizational growth.

## Machine Learning Engineering Intern

### AirQo | April 2022 – June 2022 | Remote

- Improved a fault detection ML model, boosting accuracy to 93.29% through experimentation and fine-tuning.
- Deployed the enhanced model, gaining hands-on experience in bridging theory and real-world implementation.
- Collaborated with a professional ML team, reinforcing best practices in model optimization and teamwork.

## SELECTED PROJECTS & ACHIEVEMENTS

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### TechCabal Ewè Audio Translation Challenge (Aug–Sept 2024) – 2nd Place

- **Overview:** Recognised Ewè commands from audio under resource-constrained conditions.
- **Approach:** Created a custom “Feminet” architecture (inspired by XResNet), applied noise removal, FFT-based speech processing, and pseudo-labelling for iterative improvements.

### ‘AIIntuition’: Retrieval-Augmented Generation for Public Services (May 2024) – 1st Place

- **Overview:** Developed an RAG system aimed at automating and improving public-service tasks.
- **Approach:** Combined re-ranking and advanced chunking strategies to build a straightforward yet highly effective solution.

### AI4D Africa’s Anglophone Research Lab Tanzania ASR Challenge (Aug 2023) – 1st Place

- **Overview:** Tackled low-resource language ASR challenges for Swahili.
- **Approach:** Assembled multiple ASR models (Whisper, NVIDIA NeMo, and Meta’s M4T), testing and ensembling them to achieve top performance.

### GeoAI Challenge: Location Mention Recognition (Oct 2023) – 1st Place

- **Overview:** Predicted geolocation from social media text for potential emergency response use cases.
- **Approach:** Created a simple yet powerful pipeline by assembling two NER models, enabling robust recognition of location entities in diverse text samples.

### FarmX (2023)

- **Overview:** Created a crop disease detection solution using TensorFlow Lite and improved farmer decision-making through multilingual NLP.
- **Approach:** Enhanced knowledge retrieval and real-time recommendations using RAG-based NLP in 150+ languages.

### UmojaHack Africa 2023: Cryptojacking Detection Challenge (Mar 2023) – 2nd Place

- **Overview:** Determined if system CPU resources were hijacked for cryptocurrency mining.
- **Approach:** Employed intensive data cleaning, feature engineering, and advanced modeling; leveraged Electrical Engineering knowledge of CPU architectures.

### AI4D Africa’s Anglophone Research Lab Tanzania ASR Challenge (Aug 2023) – 1st Place

- **Overview:** Tackled low-resource language ASR challenges for Swahili.
- **Approach:** Assembled multiple ASR models (e.g., Whisper, NVIDIA NeMo, and Meta’s M4T), testing and ensembling them to achieve top performance.

## Kenyan Sign Language Classification (Nov 2022) – 1st Place (67 participants)

- **Overview:** Built a classification model to recognize words in Kenyan Sign Language (KSL).
- **Approach:** Leveraged PyTorch + Fastai with an EfficientNet architecture; performed data cleaning and identified low-confidence images to boost accuracy.

## Swahili Audio Classification (Aug–Nov 2022) – 1st Place

- **Overview:** Developed a system to classify Swahili audio recordings.
- **Approach:** Fine-tuned Hugging Face-based speech models (including XLSR) and explored additional ASR architectures for cross-lingual support.

## UmojaHack Africa 2022: Faulty Air Quality Sensor Challenge (Mar 2022) – 2nd Place

- **Overview:** Detected faulty sensors in air-quality data, leading to further collaboration with AirQo.
- **Approach:** Deployed a statistical model to diagnose sensor faults, ensuring real-world viability and robust deployment.

## CERTIFICATIONS

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- **Imperial College London:** Mathematics for Machine Learning [2024]
- **Google Solution Challenge:** People’s Choice Solution Winner [2023]
- **Nvidia Deep Learning Institute:** Transformer-Based Natural Language Processing Applications [2022]

## RESEARCH & PUBLICATIONS

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- **Victor Tolulope Olufemi**, Oreoluwa Boluwatife Babatunde, Emmanuel Bolarinwa, Kausar Yetunde Moshood. *Challenging Multimodal LLMs with African Standardized Exams: A Document VQA Evaluation*. **CVPR 2025 Workshop: Vision Language Models For All**
- Babatunde, O. B., **Olufemi, V. T.**, Bolarinwa, E., Moshood, K. Y., & Emezue, C. (2025). *Beyond Monolingual Limits: Fine-Tuning Monolingual ASR for Yoruba-English Code-Switching*. In the Seventh Workshop on **Computational Approaches to Linguistic Code-Switching (co-located with NAACL)**.
- Babatunde, O. B., Akeweje, E. O., Ibejeh, S., **Olufemi, V. T.**, & Folorunso, S. O. (2023). *Automatic Speech Recognition for Nigerian-Accented English Deep Learning Indaba (Published)*
- Oreoluwa Boluwatife Babatunde<sup>1</sup>, **Victor Tolulope Olufemi**<sup>2</sup>, Toluwani Aremu<sup>3</sup> (2023). *Enhancing ASR with Zero-Shot Learning for Nigerian Accents*. **Neurips 2023 – Accepted in Black in AI Workshop (BAI)**

## EDUCATION

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**M.SC (Hons): Carnegie Mellon University** [May 2027]

Engineering Artificial Intelligence, CMU, Kigali

**B.SC (Hons): Electronic and Electrical Engineering** [August 2023]

Department of Electronic and Electrical Engineering, Obafemi Awolowo University, Nigeria

## RELEVANT STRENGTHS

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- **Ownership & Autonomy:** Comfortable leading end-to-end ML projects, from ideation through production.
- **Communication & Stakeholder Engagement:** Skilled at translating complex data solutions into actionable insights for non-technical teams.
- **Adaptability:** Proficient in **Agile** workflows, capable of pivoting quickly in a **startup** environment.
- **Ethical AI & Data Governance:** Familiar with data privacy, bias mitigation, and responsible AI frameworks.

References available upon request