

Zainab Tairu

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Bio

Machine Learning Engineer experienced in building NLP pipelines, chatbots, and TTS systems using LLMs, RAG, and knowledge graphs. Focused on developing accessible AI solutions for low-resource environments and real-world impact.

Skills

Hard Skills

Deep Learning Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Transformer Models
NLP Named Entity Recognition (NER), Sentiment Analysis, Rasa, Retrieval-Augmented Generation (RAG), Large Language Models (LLMs), Prompt Engineering
Agentic AI LLM APIs, Autonomous Agents, Knowledge Graphs
Computer Vision Image Classification
Languages Python, SQL, Cypher
Cloud & DevOps AWS (EC2, S3, Lambda), Git, GitHub
Libraries PyTorch, TensorFlow, HuggingFace, scikit-learn, spaCy, NLTK
Web & Visualization FastAPI, Streamlit, Gradio
Databases Neo4j, DynamoDB
Mathematical Analysis Linear Algebra, Calculus, Probability and Statistics

Soft Skills

Communication, Teamwork, Problem-Solving, Leadership, Adaptability, Creativity, Presentation, Attention to Detail, Time Management.

Experience

The Innoverse (Sandton, South Africa)

Oct 2024 – Present

NLP intern

- Designed an interactive chatbot aimed at streamlining customer service interactions, pending deployment.
- Designed a knowledge graph to improve the response accuracy and user engagement of the chatbot.
- Integrated Retrieval-Augmented Generation (RAG) and Large Language Models (LLMs) in the chatbot to significantly improve response quality and personalization.
- Trained Text to speech models for English and Zulu pending deployment.

Hamoye (Lagos, Nigeria)

Nov 2023 – Dec 2023

Intern

- Worked under the guidance of industry experts to train a predictive model to assess the impacts of climate change on Agricultural products
- Wrote a research proposal for the Prediction of African conflicts advocating for proactive strategies based on our analytical insights to guide crucial policy decisions.
- Designed a PowerPoint presentation highlighting the potential risks of food-related conflicts in African nations to a panel of judges.

Projects

Engineering Thermostable *Bacillus* sp. Lipase Variants

Jun 2025

- Used transformer-based protein models and conservation analysis to identify mutation points in *Bacillus* sp. lipase for improved thermal stability.
- Designed and evaluated enzyme variants using AlphaFold2 and Tomer, identifying candidates with predicted 5–10°C increases in optimal catalytic temperature.

Malaria Blood Smear Classifier

June 2025

- Built a binary classification model to detect infected vs. uninfected blood smear images, contributing to early malaria diagnosis tools.

LET ME COOK

Nov 2024

- Originated and refined a unique dataset of a diverse collection of Nigerian and globally inspired recipes adapted to appeal to the Nigerian palate from leading culinary websites and personal expertise with a specific aim to empower students to efficiently utilize their pantry items. [Check it out here](#)

Volunteering Work

Star Girls Africa

Jun 2024 – October 2024

Data science tutor

- Authored a comprehensive beginner’s curriculum in data science.
- Delivered training to 100 students, enhancing their foundational skills.
- Achieved notable increase in student engagement and skills proficiency

Hackathon

SPE Hackathon(Osun State, Nigeria)

January 2025

- Developed a machine learning model using a Self-Attention Convolutional Neural Network (SACNN) to enhance porosity prediction in reservoir characterization.
- Integrated well log and seismic data for accurate model training, achieving a Mean Squared Error (MSE) of 0.00337 and a Root Mean Squared Error (RMSE) of 0.05713.
- Authored a detailed paper on the methodology, challenges, and results of implementing machine learning for geological assessments in Nigeria’s oil sector

Conferences/Workshops

Deep Learning Indaba(Dakar, Senegal)

September 2024

- Participated in workshops and sessions on AI ethics, transformer models, and low-resource NLP, gaining hands-on experience with cutting-edge machine learning techniques.

Data Science Network AI Bootcamp(Lagos, Nigeria)

October 2024

- Participated in a hackathon to develop an English-to-Yoruba translation model, addressing NLP challenges for low-resource languages.

References

Dr. Avashna Govender

Research Group Leader, CSIR

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Mr. Simphiwe Zitha

Deep Learning Indaba Mentor

✉ nhlanhla34@gmail.com