Prince Mensah

Updated: September 19, 2025

East Legon, Greater Accra, Ghana
princemensah@aims.edu.gh
github.com/princeemensah
linkedin.com/in/prince-mensah
princeemensah.github.io

EDUCATION

African Master's in Machine Intelligence (AMMI) *Feb 2023 – Nov 2024*
Master of Science in Machine Learning

African Institute for Mathematical Sciences (AIMS) *Nov 2022 – Aug 2023*
Master of Science in Mathematical Sciences

Kwame Nkrumah University of Science and Technology (KNUST) *Oct 2017 – Nov 2021*
Bachelor of Science in Mathematics

PUBLICATION

- Mensah, P., Aderinto, P. V., Yusuf, I. S., & Pretorius, A. (2025). Physics-Informed Transformer-VAE for the inversion of the PROSAIL radiative transfer model. In Proceedings of the Pan-African Artificial Intelligence and Smart Systems Conference (PA-AISS 2025). Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering (LNICST), Springer. (*Accepted*).

RESEARCH EXPERIENCE

Physics informed Transformer-VAE for biophysical parameter estimation: PROSAIL model inversion in Sentinel2 imagery *April 2025*
Graduate Research *AMMI, Senegal*

- Developed a physics-informed Transformer-VAE architecture to retrieve vegetation biophysical variables from satellite imagery for ecosystem monitoring and agricultural management
- Implemented an innovative approach to invert the PROSAIL radiative transfer model for simultaneous estimation of leaf area index (LAI) and canopy chlorophyll content (CCC)
- Achieved state-of-the-art performance on FRM4Veg and BelSAR datasets without requiring real satellite images for training, demonstrating cost-effective and self-supervised solution

Dark-Soliton Quantum Bits from the Coherent Dynamics of Bose-Einstein Condensates (BECs) with Self-Defocusing Nonlinearity *May 2023*
Graduate Research *AIMS, Ghana*

- Investigated the coherent dynamics of Bose-Einstein condensates (BECs) with self-defocusing nonlinearity for quantum bit generation in dilute Bose gas systems
- Developed mathematical framework for finite-length BECs and studied quantum states induced by nonlinear BEC
- Explored novel mechanisms for encoding and manipulating quantum information in BECs with self-defocusing nonlinearity

Predicting the severity of road traffic accidents in Ghana using machine learning algorithms *May 2021*
Undergraduate Research (BSc Thesis) *KNUST, Ghana*

- Developed machine learning models (Random Forest, Logistic Regression, Neural Networks) to predict crash injury severity using crash-related parameters
- Evaluated model performance using accuracy, precision, recall, F1-scores, and ROC scores
- Implemented feature selection techniques to determine relevant crash attributes for severity prediction

Updates on Meningitis Surveillance in the Upper West region of Ghana (2012-2020) *July 2021*
Undergraduate Research *KNUST, Ghana*

- Analyzed long-term Meningitis surveillance data (2012-2020) from Ghana's Upper West region
- Utilized QGIS software to study spatial distribution of cases and deaths across 11 districts
- Extended previous research to provide comprehensive temporal analysis of disease patterns
- Developed visualizations to highlight trends and anomalies in Meningitis cases over time

WORKING EXPERIENCE

SevenX *Jul 2025 – Sep 2025*
Artificial Intelligence Engineer *Kigali, Rwanda*

- Building RESTful APIs and fine-tuning large language models for healthcare applications, including medical text analysis and patient data processing systems
- Developing scalable AI architectures using Docker containers and microservices for deployment in healthcare environments with strict compliance requirements
- Implementing model versioning and monitoring pipelines for healthcare AI systems, ensuring reliability and accuracy in clinical decision support applications

InstaDeep *Dec 2024 – April 2025*
AI Research Engineer Intern *Kigali, Rwanda*

- Researched on physics-informed deep learning approaches for remote sensing applications, focusing on vegetation parameter estimation from satellite imagery
- Collaborated with research teams to develop a novel Transformer-PROSAIL-VAE architecture for environmental monitoring

ALX Africa *Sep 2022 – Dec 2022*
Software Engineer Intern *Accra, Ghana*

- Built RESTful APIs for real-time data synchronization and integrated third-party services including payment gateways and shipping providers
- Implemented automated testing suites and CI/CD pipelines using GitHub Actions and Docker for continuous deployment and quality assurance

Google *Feb 2020 – Aug 2020*
Data Analytics Intern *Accra, Ghana*

- Analyzed healthcare datasets to identify patterns in patient outcomes and treatment effectiveness, providing insights for healthcare providers
- Developed healthcare analytics dashboards using Tableau to visualize patient demographics, treatment protocols, and clinical performance metrics

TEACHING EXPERIENCE

Industry Immersion Africa *Sep 2023 – Nov 2023*
Course Tutor *Accra, Ghana*

- Facilitated hands-on supplementary curriculum for industry-focused students
- Tutored courses including Introduction to Power BI, Advanced Microsoft Excel for Data Analytics, Introduction to General Management, Data & Decisions, and Agile Leadership

Galois Analytics Limited *Feb 2023 – Aug 2023*
Data Science Instructor *Accra, Ghana*

- Delivered lectures and conducted workshops on predictive analytics, machine learning, data visualization, and programming in Python and R
- Engaged in collaborative curriculum design and strategic planning with program coordinators
- Provided comprehensive guidance through hands-on practical sessions to enhance student understanding of data science concepts

KNUST *Oct 2021 – Nov 2022*
Research & Teaching Assistant *Kumasi, Ghana*

- Tutored undergraduate students in courses including Differential equations, Numerical methods, and Linear algebra
- Collaborated with faculty on research projects involving numerical methods, differential equations, and advanced linear algebra
- Designed tutorial materials and mid-semester exams while maintaining regular office hours for student support

PROJECTS

Cassava Leaf Disease Classification Competition (1st Place) | ***ResNet, Streamlit, Docker*** *2024*
ML/CV *Kaggle Competition*

- Utilised the ResNet50 model for cassava leaf disease classification, and built a web app using the model to classify cassava leaf images into one of several categories to help identify common diseases
- Project links: [Leaderboard] [Web App]

Text Summarization System | ***FastAPI, Streamlit, Transformers*** *2024*
NLP *Team Project*

- Developed a full-stack text summarization system with FastAPI backend for authentication and transformer-based summarization
- Implemented user-friendly Streamlit frontend for text input and summary visualization, with comprehensive API documentation
- Project link: [GitHub]

Sentiment Analysis on Movie Reviews | ***BERT, Apache Airflow, MLflow*** *2023*
NLP *Team Project*

- Developed an end-to-end ML pipeline for sentiment analysis using BERT, orchestrated with Apache Airflow for automated workflow management
- Implemented MLflow for experiment tracking and DVC for data versioning, with FastAPI for model deployment
- Project link: [GitHub]

Question-Answering System | ***Flask, Streamlit, Docker, SentenceTransformers*** *2023*
NLP *Personal Project*

- Developed a Question-Answering (QA) system capable of processing user queries and returning relevant passages from a given corpus as answers. The system leverages advanced machine-learning techniques and efficient data retrieval mechanisms
- Implemented Generative AI (GPT 2) model to provide direct, concise answers based on retrieved passages, and utilized Streamlit to create a UI to interact with the ML system
- Project link: [GitHub]

Connection Between American Corporate Elite | ***Social Network Analysis with Networkx, igraph*** *2023*
Data Science *Personal Project*

- Utilised Networkx package to critically analyze the connections that exist between the American Corporate Elite in the US during the 1980s and 1990s
- Employed various methods to calculate important metrics (Eigenvector centrality, betweenness centrality, degree centrality, etc.) and used igraph to identify subgraphs and communities in the network

TECHNICAL SKILLS

- **Languages**: Python, JavaScript, C/C++, MATLAB, SQL, R
- **AI & ML**: PyTorch, JAX, RAG, Flux, Hugging Face Transformers
- **Backend & APIs**: FastAPI, Flask, Streamlit, Docker, RESTful APIs
- **DevOps & Deployment**: Git, MLflow, Apache Airflow, DVC, Docker, AWS

AWARDS & CERTIFICATION

Young African AI Research Fellowship (YAAR) *2023*
Research Award *Ascend 360*

- Prestigious award initiated at Deep Learning Indaba Conference 2023, sponsored by Jeff Dean, Chief Scientist at Google DeepMind and Google Research
- Selected to nurture and develop emerging AI talent across the African continent

Master's in Mathematical Sciences Scholarship *2022*
Academic Award *AIMS*

- Full scholarship awarded by African Institute for Mathematical Science in collaboration with Ghana Government
- Awarded to talented postgraduate students from the African continent for studies at AIMS-Ghana

GNPC Scholarship Award *2017*
Academic Award *Ghana National Petroleum Corporation*

- Competitive scholarship awarded to Bachelor's students demonstrating excellent academic performance
- Supported entire undergraduate education at KNUST

AWS Certification *2023*
Professional Certification *Amazon Web Services*

- Completed Python for Machine Learning and Deep Learning Program
- Gained proficiency in building ML and DL algorithms on AWS platform

REFEREES

Referees: Below are the names and contact information of my referees.

Referee 1
Prof. Dikande Alain Moise (Full Professor)
Head of Physics Department
Faculty of Science, University of Buea
Email: dikande.alain@ubuea.cm
Website: www.ubuea.cm
Relationship: MSc. Research Project Supervisor (AIMS – Ghana)

Referee 2
Claire David
Program & Research Manager AI For Science Master's
AIMS-South Africa
Email: claired@aims.ac.za
Relationship: Lecturer, Machine Learning at AIMS-Ghana