

# MOAYAD ELAMIN

## MACHINE LEARNING ENGINEER

### CONTACT

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[Google Scholar](#)

Kigali, Rwanda

### SKILLS

- **Languages:** Python, JavaScript, SQL, C/C++, Java.
- **Machine Learning Tools:** TensorFlow, PyTorch, JAX, TFLite, OpenAI Gym, SciKit-Learn, HuggingFace
- **Data Analytics & Visualization:** Excel, Power BI, Tableau, Polaris, Pandas, Dash, Matplotlib, Seaborn.
- **Environments and Platforms:** Jupyter, Ubuntu, Linux, AWS, EC2, Google Cloud, CUDA, GitHub, GitLab, ArcGIS
- **Non-Technical skills:** Communication, Team Work, Problem Solving.

### EDUCATION

**Masters of Science in Engineering  
Artificial Intelligence**

**Carnegie Mellon University**  
2021 - 2022

**Bachelor of Science in Electrical &  
Electronics Engineering**

**University of Khartoum**  
2014 - 2020

### AWARDS

- Winner of the Common Voice African Languages STT Model Sprint 2023
- Carnegie Mellon University Africa Student Scholarship 2021
- Best Team Award - Electrical and Electronic Engineering Student Exhibition Web Development Hackathon 2018

### SUMMARY

Seasoned Machine Learning Engineer with a 4-year track record in AI, Data Science, and Software Engineering, eager to drive impactful AI applications. Recognized for deploying two AI projects into production and authoring six distinguished research papers in NLP, RL, Image Generation, and ASR. Committed to translating theoretical AI into real-world impact.

### WORK EXPERIENCE

#### Machine Learning Engineer / Researcher

Kigali - Rwanda

Trust Stamp

OCT 2023 to PRESENT

- Led work on improving company's machine learning backend, introducing more compact and better performing models to production.
- Automated identity management tasks, replacing rule based systems with AI based decision making systems.

#### Engineering Consultant: Data & Energy

Sharjah - UAE

RICOS Engineering

DEC 2020 to OCT 2023

- Led as tech lead on three company projects, overseeing software components' execution and delivery.
- Conducted energy assessments across three states, providing operational guidelines for the company and partners.
- Designed renewable energy networks, including the water system network for two refugee camps in Kassala State, serving 70,000+ refugees.
- Provided visualizations of energy production, operational trends, and water output from the camp water network of 20+ sources and pumps.
- Formulated budgets for the installation and maintenance of energy systems, achieving a 20% reduction in operational costs.
- Pioneered expansion initiatives across East Africa, identifying growth opportunities and advancing the company's mission.

#### Machine Learning Engineer

Khartoum - Sudan

Innovation Baylasan

FEB 2020 to DEC 2020

- Initiated data acquisition and implemented cleaning procedures, ensuring efficient data distribution across five departments.
- Provided strategic direction for the data science department by identifying and analyzing potential opportunities.
- Developed forecasting models for the Global Innovation Index (GII), enhancing comprehension of global trends.
- Led goal setting for the Knowledge Production & Innovation department using insights from the GII data.
- Contributed as the second author to a paper presented at the International Conference on Learning and Representation, analyzing indicator correlations in the Global Innovation Index.

#### Graduate Teaching Assistant

Hybrid: Pittsburgh - USA

Introduction to Deep Learning

Kigali - Rwanda

Carnegie Mellon University

MAY 2022 to DEC 2022

- Developed and validated coursework for the Introduction to Deep Learning course, enhancing learning for 300+ students.
- Conducted 6+ weekly office hours and organized hackathons to promote student engagement and understanding.
- Constructed tutorials on WandB, Ensembles, Hyperparameter Tuning, and scientific paper writing, available on CMU's YouTube channel with 16,000+ subscribers.

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## MACHINE LEARNING ENGINEER

### LANGUAGES

**Arabic** : Native Proficiency

**English** : Professional Proficiency

### PUBLICATIONS

- **Africa NLP - ICLR 2023 Workshop:** Multilingual Automatic Speech Recognition for Kinyarwanda, Swahili, and Luganda: Advancing ASR in Select East African Languages
- **ICCCEEE 2020:** Comparison of Deep Reinforcement Learning Algorithms in Enhancing Energy Trading in Microgrids
- **ICCCEEE 2020:** An Economic Evaluation of Islanded Microgrids Implementation in Northern Kordofan State.
- **Practical Machine Learning for Developing Countries: learning under limited/low resource scenarios - ICLR 2020 Workshop:** Modeling, Visualization, and Analysis of African Innovation Performance.

### ACTIVITIES

- **Zindi.africa:** Country Ambassador for Sudan
- **Deep Learning IndabaX:** Organizer, Mentor, Team Lead for IndabaX Sudan and IndabaX Rwanda
- **IEEE Sudan:** Team Lead, Organizer and Advisor

### TUTORIALS

- Weights & Biases and Hyperparameter Sweeps.
- Hyperparameter Tuning, Regularization and Ensemble Methods.
- Research Paper Writing.
- Attention in ASR based on LAS (Listen Attend & Spell) paper.

### WORK EXPERIENCE

#### Software Engineer - Python

Kigali - Rwanda

Carnegie Mellon University - Africa

SEP 2021 to FEB 2022

- Established a data visualization and report creation pipeline, aiding the admissions team in tracking 2000+ applicants in the 2022 cycle.
- Performed testing for CMU-Africa's library management website, supporting its launch to 200+ students.

### PROJECTS

#### MultiLingual ASR for Kinyarwanda Language

2023

Python, Pytorch, NEMO, Common voice

Automatic Speech Recognition on the Kinyarwanda language trained using the Common Voice dataset. The project uses conformer models to generate transcriptions for the speech input at a Word Error Rate of 16%. The work involved conducting an error analysis on previous models, creating data pre and post-processing for model fine-tuning, and training a new model with the NEMO toolkit.

#### Personalizing Stable Diffusion for Text-to-Image Generation using Textual Inversion

2022

Stable Diffusion, Python, Pytorch.

Utilized Textual Inversion to finetune Stable Diffusion, enabling image generation that accurately represents diverse African painting styles, resulting in a MOSS score of 4.5.

#### Attention-Based Speech Recognition

2022

Python, Pytorch

Based on the Listen, Attend & Spell paper, I created a speech recognition system that leverages a combination of Pyramidal LSTMs and Attention mechanisms. The End-to-End system allows for automatic recognition with a Levenshtein Distance of 5.5 on the WSJ dataset.

#### Deep Learning Automatic Differentiation Libraries

2022

Python, Pytorch

Leveraged Python to build a custom version of PyTorch libraries, which included implementing MLP activations, loss functions, batch normalization, constructing a NumPy-based Convolutional Neural Networks library, and building RNNs and GRUs within a similar deep learning library.

#### Article Question & Answering System

2021

Python, Pytorch, BERT, Spacy, neuralcoref, nltk, Docker

Designed a two-part Question answering system from Wikipedia articles, a Syntax and Semantics-based question generator, and a cosine distance-based answering system.

#### Enhancing Energy Trading Between Islanded Microgrids

2020

Python, Matlab, Pytorch, OpenAI GYM, SpinningUp

Optimization of Microgrid operation using Reinforcement Learning. The project involved the design of a Microgrid Matlab simulation environment and a GYM microgrid trading environment. Three RL algorithms were applied, VPG, DDPG and PPO with the a 20% reduction in initial cost for the system coming from applying PPO to the system.