

Emerald Henry

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EDUCATION

Covenant University

Lagos, Nigeria

B.S. in Mechanical Engineering—GPA: 3.87/4.0 (in top 2%)

September 2017 - July 2022

Background: Mathematics and computational methods | Interests: Knowledge graphs, Graph Neural Network, Healthcare AI

Courses

Remote/Online

Stanford: *Machine Learning with graphs (CS224W)*, *Reinforcement Learning (CS234)*, *NLP (CS224N)*

Healthcare: *Global Health*, *Universal Health Coverage*, *Managing Field Research*

EXPERIENCE

Clinton Health Access Initiative

Lagos, Nigeria

Data Support—Supervisor: Dr Chizoba Fashanu

January 2023 – Present

- Developed Databases, Dashboards and Data collection tools for the Malaria and Essential Medicines Program.
- Supported the implementation of Randomized Control Trials, field research and grant proposal development.

Molecular Biology & Computations Lab

Lagos, Nigeria

Researcher—Supervisor: Conrad Omonhinmin

August 2022 – January 2023

- Conducted research on the application of Vision Transformers, CNNs, Knowledge Distillation, and Contrastive Learning Strategies in medical imaging. Led to a publication.

The Energy and Environment Research Group

Lagos, Nigeria

Student Researcher—Supervisor: Olayinka Ohunakin

Oct 2021 - Aug 2022

- Created a novel filtering technique that works by setting quantiles on the data distribution, this was applied for outlier filtration before modelling the Wind Turbine Power Curve. Led to a publication
- Created a novel statistical technique for detecting faulty wind turbines in a wind farm. It works by calculating the Euclidean distance between data bins and performing statistical tests on them. Led to a publication.

PUBLICATIONS

- [1] **Vision Transformers in Medical Imaging: A review**, published 2022
Emerald Henry*, Onyeka Emebo, Conrad A. Omonhinmin
- [2] **Conditional Monitoring and Fault Detection of Wind Turbines Based on Kolmogorov-Smirnov Non-Parametric Test**, published 2023
Olayinka S. Ohuankin, **Emerald Henry***, Ezekiel Victor
- [3] **A Neural Network-Based Wind Turbine Power Curve Model Using Several Wind Farms' Influencing Parameters and Topography**, (A Book Chapter) 2022
Olayinka S. Ohuankin, **Emerald Henry***, Ezekiel Victor
- [4] **Techno-economic assessment of offshore wind energy potential at selected sites in the Gulf of Guinea**, published 2022
Olayinka S. Ohuankin, Olaniran J. Matthew, Windmanagda Sawadogo, **Emerald U. Henry**
- [5] **Design and Implementation of the electrical system of a mini-racecar**, preprint 2022
Emerald Henry

COMPUTATION PROJECTS

Quantile Filtering Algorithm

- Created a novel filtration algorithm that appends user-defined quantiles on the data distribution, it is comparative to state-of-the-art wind data filtration techniques, and is continuously utilized for data filtration within the Energy and Environment Research Group.

Confidence Level Estimation Technique

- Developed a statistical technique for detecting underperforming turbines within a wind farm by defining bin-wise confidence levels that are based on the Euclidean distance between data points in a plane specified by wind speed and power output.

Food Classification App

- Deployed a Vision Transformer model for classifying food types to Hugging Face Spaces using the Gradio framework.

LEADERSHIP & VOLUNTEERING

Data Analysis & Machine Learning Educator

Creating Training Curriculums, Machine Learning, Deep Learning and R training jupyter notebooks. Tutoring Data Analysis and Machine Learning.

Enactus

Contributed to the various social entrepreneurship initiative the Covenant University Enactus club carried out.

Skills & Achievements

Languages: Python, C/C++, R, Rust, Shell Scripting, SQL

Tools & Frameworks: Pytorch, OpenCV, Tensorflow, Keras, Git, L^AT_EX, Docker

Achievements: *Best Project Award: CU 2022*, *Winner: Covenant University Covid-19 challenge (Top 5)*, Top 3, National University Entrance Examination.