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: Production ML, ML on Relational Databases, Knowledge graphs

Courses — Remote/Online
Stanford: *Machine Learning with graphs (CS224W), Reinforcement Learning (CS234), NLP (CS224N)*
Healthcare: *Global Health, Universal Health Coverage, Managing Field Research*

EXPERIENCE

Data Science & Machine Learning — Lagos, Nigeria
Tutor—Local Christian assembly: (Part-time) — *Sept 2023 – Present*

- Created training notebooks and files for Data Analysis with R, Databases (MySQL) and MLOps (Docker, FastAPI, CLI scripts, CI/CD and deployment).

Clinton Health Access Initiative — Lagos, Nigeria
Data Support—Supervisor: Dr Chizoba Fashanu — *Jan 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
ML Researcher—Supervisor: Conrad Omonhinmin — *Aug 2022 – Jan 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
ML Student Researcher—Supervisor: Olayinka Ohunakin — *Oct 2021 - Aug 2022*

- Created a novel filtering technique that is 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
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COMPUTATION PROJECTS

Food Classification App

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

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.

LEADERSHIP & VOLUNTEERING

Hebron Motorsports
Oversaw the manufacture of the first semi-professional racecar in West Africa, Designed the Electrical system

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

Skills & Achievements

Languages: Python, C/C++, R, Rust, SQL, CLI(shell, bash), YAML
Tools & Frameworks: Pytorch, OpenCV, Tensorflow, Keras, Git, LaTeX, Docker, FastAPI
Achievements: *Best Project Award:* CU 2022, *Winner:* Covenant University Covid-19 challenge (Top 5), Top 3, National University Entrance Examination.