Emerald Henry

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EDUCATION

Covenant University *September 2017 - July 2022*
B.S. in Mechanical Engineering GPA: 3.87/4.0
Highlights:

- Interests; Computational modelling, Medical Imaging and Data analysis in Healthcare.
- Proficiency in Computational modelling
- Strong Background in Electrical designs
- Strong Passion for research

EXPERIENCE

Clinton Health Access Initiative *January 2023 – Present*
Data Analyst (Supervisor: Dr Chizoba Fashanu)

- Analyzed antimalarial sales and diseases burden data in rural local government areas in Lagos Nigeria with the aim of making the required healthcare service available and affordable in these areas.
- Analyzed data for the accessibility of oxygen cylinders in health facilities across Nigeria in bid to prevent Hypoxemia.

Molecular Biology and Computations Lab (CUCIRF) *August 2022 – January 2023*
Graduate research intern (PI: Conrad Omonhinmin)

- Conducted research on the application of vision transformers in medical imaging, this led to a publication
- Conducted research on the application of ConvNets to the various medical image modalities
- Prepared and analyzed digital whole-slide-images
- Explored various H & E staining procedures in order to obtain a standard procedure for the lab

The Energy and Environment Research Group *October 2021 - August 2022*
Student Researcher (PI: Olayinka Ohunakin)

- Created a novel filtering algorithm based on quantiles on a probability distribution using Python, and applied for filtration of faulty wind turbine data
- Created a novel statistical technique based on the Euclidean distance between data points within a bin and 2 well developed tests of the null hypothesis, with Python and R, applied in wind farm monitoring
- Developed two wind turbine power curve models using Tensorflow
- Published three papers on Wind Turbine Power Curve and Wind Energy

Hebron Motorsports *January 2020 - June 2022*
Electrical Team Lead (FA: Olayinka Ohunakin)

- Designed and Fabricated a multi-layer SMT printed circuit board using Altium designer software, and utilized for automatic safety control
- Designed and implemented an electro-pneumatic gear shifting system
- Designed, built and implemented the entire electrical system for a Formula Student racecar

Clarke Energy *May 2021 - October 2021*
Electrical Engineering Intern (PS: Christian Umeh)

- Installed safety control loops for Jenbaucher Type 6 reciprocating engines

PUBLICATIONS

[1] **Vision Transformers in Medical Imaging: A review**, published 2022
Emerald Henry*, Onyeka Emebo, Conrad A. Omonhinmin

[2] **Wind Turbine Power Curve Model Driven Conditional Monitoring and Fault Detection of Wind Turbine**, published 2023
Emerald Henry*, Olayinka S. Ohuankin, Ezekiel Victor

[3] **A Neural Network-Based Wind Turbine Power Curve Models Using Several Wind Farms' Influencing Parameters and Topography,** published 2022
Olayinka S. Ohuankin, **Emerald Henry***, Ezekiel Victor

[4] **In-Situ Based Observation and Reanalysis-derived Wind Data for Offshore Wind Energy Potential 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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PROJECTS

Quantile Filtering Algorithm

- Created a novel filtration algorithm that appends user defined quantiles on a probability distribution of unfiltered data, it is comparative to SOTA 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

Electro-Pneumatic Gear Shifting System Design

- Designed a single integrative schematic circuitry for the system
- Programmed the microcontrollers for automatic control using C++
- Built and Implemented this design on the racecar

Brake System Plausibility Device PCB Design

- Designed a schematic circuitry for the circuit board
- Created the circuit board's computer aided design using Altium designer software

LEADERSHIP AND SERVICE

The Energy and Environment Research Group *January 2022 – May 2022*
Created research knowledge acquisition path for newer members

Hebron Motorsports *January 2020 - June 2022*
Mentored newer team members on electrical system design fundamentals

AWARDS

Best Undergraduate Research Project, 2022

Total Energy Scholarship Recipient, (2018-2022)

Covenant University Covid-19 Challenge Winner, 2020

Top 3, National Universities' Entrance Examination, 2017

TECHNICAL SKILLS

Computer Skills Python (Pytorch, Tensorflow, Pandas, Numpy, Scipy ...), C++, Git, Shell, Altium, MSoffice