British Citizen and Full UK Driver's License

MADELINE LUI

madelinewylui@gmail.com Portfolio LinkedIn GitHub

SUMMARY

With 4 years of experience in statistical analysis, I hold a bachelor's degree where I conducted research with statistical computing. This work contributed to establishing robust statistical methods in basic science.

My background gives me strong skills in interpreting complex datasets to report key findings. For example, I've worked on solar energy generation analysis on two photovoltaics panels in India. I conducted historical data analysis to evaluate the system's energy conversion efficiency and performance ratio. I also performed short-term predictions on power output and improved my model accuracy by 80%. This field of work importantly contributes to monitoring renewable energy.

Moreover, I am experienced in communicating to a technical and lay audience. For instance, my presentation on my bachelor's research was awarded 'Best Presentation' at a Scottish undergraduate conference in my research category. Additionally, I have over four years experience teaching Sunday school to children aged 5-12. For this reason, I've honed excellent communication skills to a range of audience.

Currently, I continue my professional development by developing an interactive analysis platform for modelling wind energy production.

SKILLS

Python, R, MATLAB, Statistical Testing and Modelling, Data Visualisation.

PROJECTS

Wind energy generation analysis Ongoing

- **Aim**: Analyse historical data and perform short-term forecast from a SCADA system in Turkey over a 12 month period, and present the key findings for operational analysis on Python Shiny.
- **Skills used**: Python, Time-series Forecasting, Interactive Analysis Platform.

Solar photovoltaics power forecasting 2024

- **Aim**: Analyse the performance and energy yield of two solar panels in India across 35 days, and forecast photovoltaics power output to manage solar plant output efficiency.
- **Result**:
  - Conducted an exploration analysis on sensors and panels to identify a 97% conversion efficiency and 12% performance ratio for data-driven recommendations on equipment maintenance.
  - Compared model performance of forecasting power output on 3 machine learning models, before implementing the XGBoost model on the variables Time, Module Temperature and Irradiation to improve accuracy by more than 80%.
- **Skills used**: Python, Time-series Forecasting, XGBoost, Data Visualisation.

Multivariate analysis and bootstrapping of neural representations 2023—2024

- **Aim**: Investigate how haptic properties of objects are represented in the brain.
- **Result**:
  - Collaborated on the pipeline for performing multivariate analysis on signal activity of 12 subjects in a team of 2.
  - Generated bootstrap distributions of 2000 mean beta values of signals, to robustly simulate the data should the experiment be conducted 2000 times.
- **Skills used**: MATLAB, Hypothesis Testing, Vectors and Matrices, Bootstrapping, Multivariate Analysis

EXPERIENCE

Muckli Lab, University of Glasgow 2023—2024

Undergraduate Research Assistant

The Muckli Lab uses computational neuroscience and functional magnetic resonance imaging to study predictive coding.

- Automated the detection of object occlusions in images by analysing image depth, from a dataset of >200k images.
- Developed an interactive user interface to filter images with object occlusions according to the user's requests.
- Performed pre-processing and analysis of 7-Tesla fMRI data, including grey and white matter segmentation, motion-correction, normalisation and noise extraction.
- **Skills used:** Python, MATLAB, Automation, ZoeDepth Model, Streamlit Dashboard, ITK-SNAP.

EDUCATION

University of Glasgow (First Class Honours) 2020 — 2024
BSc (Hons) Psychology with Neuroscience Specialism

Relevant Modules: Probability Theory, Bootstrap Analysis, Statistical Testing and Modelling, Regression, Model Comparison, Principal Component Analysis, R Programming.

United World College Li Po Chun of Hong Kong 2018 — 2020
Lycée Français International de Hong Kong 2013 — 2018

PROFESSIONAL DEVELOPMENT AND AWARDS

MIT Open Course Ware Ongoing

- Studied course on differential equations consisting of 30 lectures and assignments.

International Standard for Photovoltaics System Performance (Edition 2.0 2021) 2024

- Studied 'Part 1: Monitoring' of the international standard for photovoltaics system performance in my own time.

BPS Conference Award 2024

- Awarded Best Presentation in cognition and perception at the annual undergraduate conference hosted by the British Psychological Society.

Imperial College London, Coursera 2022

- Completed 2 courses on multivariate calculus, linear algebra and Python programming, consisting of assignments and assessments.

Concerto Primo Performance Zertifikat (Pianoforte) 2018

- Awarded by the Vienna Music Examination Board, equivalent to a final year bachelor music student. This qualification was earned from my piano education since age 4, which I've continued playing over the last 18 years.

VOLUNTEERING

Children's Ministry Hong Kong and Scotland 2019 — 2023

- Led Sunday church programs for children ages 5-12 and weekly meetings with over 10 volunteers.
- Successfully managed last-minute challenges, including stepping-in to lead a team of 4 volunteers and >30 children, and implementing conflict resolution strategies, resulting in an 80% increase in team efficiency during high-pressure situations.
- Coordinated the annual curriculum and delegated responsibilities to a cross-functional team of 6.

LANGUAGES

English Native
French Full professional proficiency
Spanish Professional proficiency