Milo Shan

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github.com/MoodyMarshmallow

Education

University of Pennsylvania, BS in Artificial Intelligence — Sept 2024 – Present

- Benjamin Franklin Scholar
- **Coursework:** Java and OCaml Programming, Honors Calculus II, Intro to Mechanical Design, Intro to AI, Mathematical Foundations of Computer Science, Linear Algebra With Applications in AI

MIT-ISASA Workshop on Natural and Artificial Intelligence — Jan 2023

Yale Young Global Scholars, Innovations in Science and Technology Program — Jul 2021

Online Courses

- Supervised Machine Learning: Regression and Classification – Deeplearning.AI — Apr 2024
- Configuration Management and the Cloud – Google — Sep 2021
- Troubleshooting and Debugging Techniques – Google — Jan 2021
- Intro to Git and GitHub – Google — Dec 2020

Experience

Research Assistant, University of South Africa – Johannesburg, South Africa — Jun 2022 – Jul 2024

- Conducted exploratory data analysis to confirm ability of machine learning algorithms to determine optimal Metal-Organic Frameworks (MOFs) for CF_4 and N_2 Absorption
- Assisted in improving accuracy of machine learning algorithms
- Published in Separation and Purification Technology (Impact factor 8.1)

Independent researcher, Johannesburg, South Africa — Feb 2021 – May 2023

- Collected novel high-temporal-resolution weather dataset for Southern African climates
- Used data to train and compare the accuracy of machine learning models such as neural networks, support vector regression, and random forest
- Random Forest Regressor achieved an R-value (accuracy) of 0.84
- First authored and presented paper at IEEE ICMIMT (only high school paper accepted)

Publications

Computational prediction of MOFs with the potential to improve the efficiency of industrial CO_2 capture — July 2024

Hong Xu, Liberty L. Mguni, ***Yutang Shan***, Linda L. Jewell, Diane Hildebrandt, Yali Yao, Xinying Liu,
10.1016/j.seppur.2024.128927

Machine Learning Regression to Predict Soil Moisture in Domestic Garden Environments — May 2023

Yu Tang Shan, Zhaobo K. Zheng,
10.1109/ICMIMT59138.2023.10199334

Projects

Machine Learning Models for Soil Moisture Prediction *Github link*

- Used collected environmental data to train and compare the effectiveness of various machine learning models.
- Random Forest Regressor was the most accurate, achieving an R-value of 0.84.
- Conducted feature importance analysis of random forest regressor.
- Tools Used: NumPy, Pandas, Scikit Learn, Matplotlib, Jupyter Notebook

Custom Environmental Data Collection System *Github link*

- Created custom sensor array to collect environmental data of a typical Southern African home garden.
- Parameters included: Soil moisture & temperature, Air humidity & temperature, light levels, wind speed, etc.
- Designed automatic sprinkler system to record effects of sprinkler activation in the garden.
- Tools Used: Arduino, C++, Python

Weather Image Recognition Using ResNet50 *Github link*

- Built customized ResNet50 model to classify weather conditions of images
- Used dropout layers, cyclic learning rates, and regularization techniques to mitigate high class imbalance in data
- Tools Used: Pytorch, Jupyter

Awards

Global Finalist, International Science & Engineering Fair (ISEF) 2023

- Top 0.025% of participants

Winner, South African Eskom International Science Fair: 2022

- Top Senior Scientist Award (Grand Prize)
- Computer Science Senior Category Winner
- Best Innovation Project

Top 15 Global Finalist, Breakthrough Junior Challenge 2022

- Top 0.625% of all participants)

Global Finalist, Conrad Challenge 2022

- Energy & Environment Category (Top 5 out of 120+ teams)

National Team Captain, International Young Physicists' Tournament (IYPT) 2022

Gold Award ($20,000 scholarship), Genuis Olympiad 2022

Skills & Technologies

Languages: Python, C++, Java, Bash, C#

Technologies: Jupyter, Git, PyTorch, Numpy, Pandas, Arduino, Onshape, Blender