Taiyuan Zhang
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Education

University of Nottingham Ningbo China (UNNC), Mathematics and Applied Mathematics 09/2020-Now

- Expected GPA: 3.82/4.0, Average Sophomore year mark: 83, Expected First Class Honours.
- Core modules: Calculus, Linear Mathematics, Probability, Statistics, Optimization, and Stochastic Process.
- Honors: Provost's scholarship for 2023-24; Zhejiang Provincial Government Scholarship for 2022-23, 2023-24; Ningbo City Government Scholarship for 2022-23; Outstanding Students of UNNC for 2022-23.

University of Nottingham UK (UNUK), Mathematics and Applied Mathematics 09/2022-06/2023

- Exchange program to the UK campus for one year.
- Average Junior year mark: 87 (Rank: Top 5%)
- Core modules: Statistical Models and Methods, Mathematical Analysis, and Complex Functions.

Online courses: Machine Learning from Stanford University; Mathematics for Machine Learning from Imperial College London; Statistical Inference from Johns Hopkins University; Bayesian Statistics from UC Santa Cruz; Data Structures and Algorithms from UC San Diago; Applied Data Science with Python from University of Michigan.

Research Experience

Data analysis project in Shenzhen Bay laboratory, a national key laboratory 07/2023-09/2023

Guided by Professor Chao Wang

- Aimed to study the mutation patterns of SARS-CoV-2 spike proteins, a key protein for the pandemic.
- Identified protein mutation hotspots in R, designed an adaptive algorithm capable of automatically determining the optimal shape and size of these hotspots; Utilized the Gaussian Process to capture the mutation patterns of the protein, thereby enhancing the efficiency of the experiment and vaccine design.
- Completed a systematic approach to Feature Engineering, including Permutation importance; Performed Bayesian Optimization to improve the model by tuning hyperparameters; Applied the Synthetic minority over-sampling technique (SMOTE) to address the imbalanced distribution of mutation instances.

University of Nottingham, Machine Learning Research Program 05/2022-08/2022

Guided by Professor Saeid Pourroostaei Ardakani

- Analyzed Freddie Mac Loan-Level dataset and Historical Stock Market dataset.
- Utilized Python to develop a diverse range of Machine Learning models for Prediction and Classification, including GRU, and LSTM, as well as baseline models such as Logistic regression and Random Forest; Incorporated the data visualization tool Facets to gain insights into the datasets.
- Performed Feature Attribution techniques including Gradient-based Saliency and Integrated Gradients; Explored Self-Attention mechanism for improving the model.

University of Nottingham, Biomathematics research program 09/2022-06/2023

Guided by Professor Mainul Haque

- Analyzed system bifurcation of a prey-predator model; Conducted stochastic stability analysis.
- Assisted my tutor in completing the relevant article writing in LaTex.

Internship

Zhongce Rubber Group Co., Ltd, world's top ten tire manufacturers 06/2022-07/2022

- Built a MATLAB program that could calculate the parameters for the Hans B. Pacejka model, which is an empirical tire model based on experimental data; Enhanced the result of a bicubic polynomial interpolation function based on the six-component force model for a tire.
- Designed respective MATLAB GUI programs for convenient utilization; Enhanced the R&D process of the company.

Competitions

Formula Student team of school, Data Analyst and Simulation Technician 12/2020-07/2022

- Collected and cleaned data from actual tests of components, structures, or the complete vehicle to provide data support to the team.
- Developed functions in Python for simulating car performance on the track; Employed genetic algorithms to optimize the design of chassis components; Utilized SolidWorks for mechanical simulation.
- Designed more than 10 functional components on the vehicle; Provided recommendations to improve the performance of components or the entire vehicle based on the data analysis.
- Won the third prize in the National Formula Student Competition.

English & Skills

- IELTS:7.5, GRE: 326
- Coding in Python, MATLAB, R, and LaTeX; Using SOLIDWORKS; First Aid CPR AED training from AHA.