Facheng Yu

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School of Mathematics and Statistics, Wuhan University

EDUCATION

Wuhan University - Wuhan, Hubei, China Graduation: June 2023

- **Basic information:** Bachelor of Science in Mathematics, GPA: 3.84/4.00 (90.3/100), rank: 3/30.
- **Key courses:** Mathematical Analysis, Advanced Algebra, Abstract Algebra, Differential Equations, Topology, Real Analysis, Complex Analysis, Differential Geometry, Probability Theory, Functional Analysis, Numerical Analysis, Optimization Theory and Methods.
- **Elective courses:** Quantum Information and Quantum Computation, Machine Learning, Multi-scale Analysis.
- **Awards:**
  - Third prize of Asia and Pacific Mathematical Contest in Modeling Jan. 2022
  - Third prize of The Chinese Mathematics Competitions Dec. 2021
  - Second class scholarship Oct. 2021
  - Third class scholarship Oct. 2020

RESEARCH EXPERIENCE

Undergraduate innovation project in Wuhan Univeristy Apr. 2021 - Sept. 2022

- **Project:** A precipitation prediction system based on machine learning and multi-source data
- **Task:** Currently, I have made some research on the threshold method with the water vapor, including analysing the related work in the rain nowcast, proposing ideas for the improvement and testing the effects. For better validation, I gave a clear description of the rain events so as to help define the evaluation indexes. Besides, I contributed to the paper writing in the introduction and validation as well.
- **Output:** one paper (under review) about rain nowcast based on the traditional three-predictor threshold method.

Computer Vision & Remote Sensing Lab, Wuhan University Oct. 2021 - Jan. 2022

- **Project:** The Application of deep learning in multi-view commodity recognition
- **Task:** In this project, I transferred the models for face recognition into commodity recognition, and then the supervised contrast learning, which achieved a high accuracy for a single image while a low Top-1 accuracy when processing a video with several goods. To improve the poor effects for videos, I took up the dictionary established in MOCO and proposed a weighted method for the retrieval in the embedding space. This helped to achieve a Top-5 accuracy of nearly 100% for the recognition in videos.

ONLINE PROJECTS

Yau Mathematical Sciences Center, Tsinghua University - Beijing, China
Online summer school | Completed Jun. - Aug. 2020

- **Course:** examples and exercises of big data analysis (Prof. Xiaoming Zhang)
- **Content:** In the course, I finished several projects including the crowd simulation with agent-based modeling, the tickets prediction with multiple linear regression, ingredient proportion with adjacent interpolation, and industrial quality control with SVM for the product classification.

University of Cambridge - Cambridge, U.K.
Theoretical neuroscience online project | Score: A Jan. - Feb. 2021

- **Course:** Theoretical Neuroscience (Prof. Guillaume Hennequin)
- **Project:** Balanced network models of cortical circuits
- **Content:** The final project is to build a digital balanced network of cortical circuits, and my work was to solve the linear system to get the theoretical mean and variance of the neurons' spiking based on the leaky integrate-and-fire model, as well as to implement the code to simulate the interactions of the excitatory, the inhibitory and the external neuron population.

Artificial intelligence online project | Score: A- July - Oct. 2021

- **Course:** Artificial Intelligence (Prof. Pietro Liò)
- **Project:** Video summarization with flexible multi-agent reinforcement learning
- **Content:** In this project, I helped to explain the model structures and corresponding formulas to group mates, and tried to build a model with multi-agent reinforcement learning. I built a network based on LSTM to receive the context and generate the policy, and optimized the model with the Monte Carlo method. To promote training efficiency, I also adopted PPO to optimise the model.

SCHOOL ACTIVITY

New Media Center, Wuhan University Sept. 2019 - Jun. 2021

- Journalist
- My work was to interview standouts and record big events in Wuhan University and write articles on the WeChat official account.

SKILLS

English

- College English Test Band 4: 575; College English Test Band 6: 517.

Coding

- Good at Python and MATLAB. Finished several projects with PyTorch.

Sport

- Interested in swimming and mini-Marathon.