Yuanhao JIANG

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Intro

- Current undergraduate student with an interest in machine learning and statistical modelling, particularly interested in generative models, computer vision, and multimodal learning. Research experience in score-based generative modelling with SDEs and reinforcement learning with applications to quantitative finance.
- Ability to undertake both theoretical and computational works, e.g., algorithm and model construction, numerical solutions, statistical inference, pure mathematics works including algebra, analysis, differential equations, SDEs and so on.

Education

- **The University of Edinburgh** Scotland, UK
  BSc (Hons) in Mathematics and Statistics *Sep. 2020 - Present (graduate in 2024)*
  - ***Grades:***
    Year 1: First Class, average grade 91% (equivalent GPA: 4.0)
    Year 2: First Class, average grade 89% (equivalent GPA: 4.0)
    Year 3: First Class, average grade 88% (equivalent GPA: 4.0)
    Year 4: Predicted First Class
  - ***Prizes and Medals:***
    2021/22: School of Mathematics College Vacation Scholarship
    2022/23: James Ward Prize for distinguished performance in the Degree Examinations in Mathematics & Statistics
    2022/23: Arthur Erdelyi Prize for distinguished performance in the Degree Examinations for Mathematics
    2022/23: School of Mathematics College Vacation Scholarship

- **Hong Kong Baptist University** Hong Kong
  BSc in Mathematics (Year 1) *Sep. 2019 - May 2020*
  - ***Grades:*** *Year 1 cGPA: 3.72/4*
  - *Withdrew after successfully finishing year 1 and began at the University of Edinburgh*

Research

- ***Score-Based Diffusions & Numerical Methods for Stochastic Differential Equations***
  Supervisor: Prof. Benedict Leimkuhler *May 2023 - Sep. 2023*
  - Applied innovative approaches, especially the Leimkuhler-Matthews discretization method, for solving SDEs, to both the perturbation process and denoising process. Compared sample quality and training efficiency with traditional numerical SDE solvers including the Euler-Maruyama method, the Milstein method, the stochastic Runge-Kutta method and so on.
  - Embeded the diffusion coefficient function in perturbation SDE with spatial information to allow potentially higher perturbation flexibility.
  - GitHub repository will be released in due course.

- ***Mathematics of Reinforcement Learning with Applications to Quantitative Finance***
  Supervisor: Prof. Lukasz Szpruch *Jun. 2022 - Sep. 2022*
  - Constructed interactive environment to model specific quantitative finance scenario.

- Implemented various model-free algorithms, including Actor-Critic, REINFORCE, and Proximal Policy Optimization (PPO), to train our pricing policy. Compared different algorithms for training efficiency and effectiveness.
- **GitHub repository:** github.com/Yuanhao-JIANG/RL-in-QF

Skills

- **Core softwares:** Python, R, Java, Haskell, Git, HTML, CSS, LaTeX, C, Processing, MIPS assembly
- **Tools & Frameworks:** Vim, PyTorch, LWJGL, Bootstrap
- **Platforms:** Linux (Arch Based), MacOS, Windows
- **Languages:** English, Chinese (Mandarin)

Experience

- **London Mathematical Society Undergraduate Summer School 2023**
  Summer School Delegate *16th - 28th Jul. 2023*
  - Nominated by the school of mathematics at the University of Edinburgh as one of the 50 students in the UK to attend.
  - Consists of a combination of short lecture courses with problem-solving sessions and colloquium-style talks from leading mathematicians, covering various fields of mathematics including probability theory, statistics, information theory, complex analysis, mathematical physics, computational number theory, Uncertainty quantification for computer models and so on.
- **Careers Service, The University of Edinburgh** Part time
  WeChat Assistant *Sep. 2021 - Sep. 2022*
  - Managed the UoE Careers Service WeChat account with more than 1500 students each year, grouped fresh students on their matriculation, and maintained alumni groups.
  - Searched, examined, shared and posted job opportunities and career events across UK and China.
  - Kept in touch with employers, built employers groups to provide more and better opportunities with up-to-date information.

Personal Projects

- **Translation with RNN/Transformer model**
  - A program to train AI translators utilizing RNN or Transformer models, able to translate from English to Chinese. The program is written in Python with PyTorch and Fairseq (a sequence modeling toolkit by Facebook).
  - Link: github.com/Yuanhao-JIANG/ml-translation
- **Handwriting recognition with CNN structure (LeNet)**
  - A handwriting recognition program utilizing a simple convolutional neural network, LeNet. The program is written in Python with PyTorch package.
  - Link: github.com/Yuanhao-JIANG/ml-handwriting-recognition
- **Lightweight game engine**
  - A lightweight Java game engine supports OpenGL. The engine is written in Java, and is still under construction.
  - Link: github.com/Yuanhao-JIANG/Java_game_engine
- **Light weight parkour game written by Processing**
  - A small parkour game written in Processing. The game is simple enough with only about 700 lines of codes, but it is the very first program I wrote since I started to learn programming.
  - Link: github.com/Yuanhao-JIANG/Parkour_game
- **For more projects visit my GitHub site: github.com/Yuanhao-JIANG**