Yuanhao JIANG

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Intro

- Current undergraduate student with an interest in machine learning and statistical modelling, particularly interested in generative models. Research experience in score-based generative modelling with SDEs and reinforcement learning with applications to quantitative finance.
- Ability to do 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
  Mathematics and Statistics (BSc Hons) *Sept 2020 - Present (graduate in 2024)*
  - ***Grades:***
    Year 1: First Class, average grade 92% *Year 2: First Class, average grade 90%*
    Year 3: First Class, average grade 88% *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 *Sept 2019 - May 2020*
  - ***Grades:*** *Year 1 cGPA: 3.72/4*
  - *Withdrew after finishing year 1 and then came to the University of Edinburgh*

Research

- ***Score-Based Diffusions & Numerical Methods for Stochastic Differential Equations*** *May 2023 - Present*
  - Apply innovative approaches, especially the Leimkuhler-Matthews discretization method, for solving SDEs, to both the perturbation process and denoising process. Compare 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.
  - Embed 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*** *Jun 2022 - Sep 2022*
  - Construct interactive environment to model specific quantitative finance scenario.
  - Implementing various model-free algorithms, including Actor-Critic, REINFORCE, and Proximal Policy Optimization (PPO), to train our pricing policy. Compare 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

- **2023 LMS Undergraduate Summer School** *16th - 28th July 2023*
  - The undergraduate summer school held by London Mathematical Society (LMS) with 50 places each year.
  - 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 *Sept 2021 - Sep 2022*
  - Manage the UoE Careers Service WeChat account, group fresh students on their matriculation, and maintain alumni groups.
  - Search and examine, share and post job opportunities and career events across UK and China.
  - Keep in touch with employers, build employers groups to provide more and better opportunities with up-to-date information.

Own 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**