Bofan Chen

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Education

MAST in Mathematical Statistics Aug. 2023 - Jun. 2024

Department of Pure Mathematics and Mathematical Statistics, University of Cambridge *Cambridge, United Kingdom*

- Courses: Topics in Convex Optimization, Numerical Solution of Differential Equations, Topics in Statistical Theory, Information Theory, Advanced Probability, Stochastic Calculus and Applications, Functional Data Analysis

Bachelor of Economics in Finance Jun. 2019 - Jun. 2023

School of Economics, Peking University *Beijing, China*

- Overall GPA: 3.8/4.0
- Courses: Mathematical Analysis I/II/III (93,87,92), Functions of Real Variables (P), Linear Algebra and Geometry (88), Advanced Algebra (86), Probability and Mathematical Statistics (98), Mathematical Introduction to Machine Learning (93), Mathematical Methods in Finance (100), Data Structure and Algorithm(B) (92)

Bachelor of Engineering in Robotics Engineering (Dual Degree) Jun. 2021 - Jun. 2023

College of Engineering, Peking University *Beijing, China*

- Major GPA: 3.8/4.0
- Courses: Advanced Dynamics(98), Theoretical Mechanics (P), Aerodynamic Foundation (93), Mathematics in Engineering (86), Signals and Systems (89), Swarm Intelligence (98), Robot Perception and Control (P), Analog Electronic Technology (89), Digital Circuit Technology (95), Robotics Experiments I/II/III (92.5,P,92)

Experience

Meta Learning for Time Series Data Nov. 2023 - Present

Research Project Advised by Prof. Mihaela van der Schaar *Cambridge, United Kingdom*

- Investigated the latest meta-learning methods including MAML, SNAIL, Gradient Decent as LSTM, and the latest time series model structures including Transformer, LSTM, GRU, Neural Laplace, Neural ODE
- Coded the meta-learning program for synthetic time series data and developed a fast time series implicit neural representation (INR) method using SIREN architecture.
- Used meta-learning method to improve the functional principal component analysis under the sparce functional data scenario.
- Exploring whether meta-learning can learn the information of diffirent differential equations

Modelling Human Interaction Patterns by Temporal Networks Jun. 2022 - Present

Research Project Advised by Prof. Aming Li *Beijing, China*

- A first-authored paper *Temporal local clustering coefficient uncovers the hidden pattern in temporal network* on *Physical Review E* is under review
- Proposed the local temporal clustering coefficient in temporal networks to quantify the clustering phenomenon in network by considering temporality
- Discovered that the proposed temporal local clustering coefficient can serve as an efficient identifier to distinguish different core-driven patterns of temporal networks
- Found that the temporal local clustering coefficient can sensitively identify noise in temporal networks, enabling a more accurate reflection of the connections among nodes' neighbors
- Analyzed the underlying relationship between temporal and static clustering coefficient that reveals essential characteristics of different interaction patterns for various empirical datasets

Comparison of Asset Pricing Models Dec. 2022 - May 2023

Research Project Advised by Prof. Xi Wang *Beijing, China*

- Compared different types of asset pricing models by using Bayesian statistics method
- Implemented the Markov chain Monte Carlo (MCMC) method in Python to calculate the posterior probability of each potential model
- Derived the analytical solution of each potential model's posterior probability using power-law priors (including Jeffery prior and uniform prior) and analyzed the result's robustness among these priors
- Applied this model to the data from Chinese stock market and selected the most efficient asset pricing factors and models in China

Design of Ground-Air Cooperative Delivery System Nov. 2021 - Apr. 2022

Research Project Advised by Prof. Xuefeng Wang *Beijing, China*

- Aimed to incorporate unmanned vehicles and drones for realizing unmanned express
- Programmed a pure pursuit controller with ROS in Python that enable the unmanned vehicle to track the precomputed waypoints
- Implemented serial communication for the differential GPS in ROS to achieve centimeter-level relocalization performance
- Designed the lifting platform on the unmanned vehicle to land drones and pass package from the unmanned vehicle to the drone

Flintstone Robotics Co., Ltd. Jul. 2021 - Feb. 2022

Internship Advised by Nan Yang *Shanghai, China*

- Literature review of some traditional motion detection algorithms such as background subtraction, temporal difference, optical flow for estimating manipulator posture
- Modified the source code of GMAPPING in ROS for application on non-ROS systems
- Matched RGB image information from camera and the pointclouds from LiDAR in order to fuse visual information into traditional LiDAR-based SLAM methods
- Programmed to match the objects between different frames by feature point recognition methods including SIFT and ORB
- Used principal component analysis to compress pointclouds from LiDAR in order to realize faster communication

Course Projects

A Review and Research of the Evolutionary Game Theory on Network Oct. 2021 - Jan. 2022

- Wrote a literature review of three key papars on *Nature* about the evolutionary game theory on network
- Derived the fixation probability of public goods game on the finite regular network under imitation (IM) updating process
- Compared the fixation probability between the public goods game and the two-sided matching game in the finite network

Awards

Scholarship

- Shandong Greenland Spring Scholarship Dec. 2021
- Third Class Scholarship of Peking University Jan. 2021

Award

- Peking University Learning Excellence Award Dec. 2020, Dec. 2021

Prize

- First Prize in Beijing Mathematical Modeling Competition Nov. 2021
- Second Prize in National Mathematical Modeling Competition Nov. 2021
- Honorable Mention in Mathematical Contest in Modeling May 2021
- First Prize in Chinese Mathematics Competition Dec. 2020

Leadership

OneWho (A student organization in Peking University) Nov. 2021 - Jun. 2023

A Member of Team Founders *Peking University*

- Founded a team of students from different departments to apply our knowledge into engineering practice
- Collaborated with a variety of engineers from industry
- Set up a course for drone design that was applied by more than 100 students from various departments every semester
- Mentored 24 students for mechanical design, circuit design, and controller programming

Skills and Hobbies

Language Ability: Chinese (Native), English (IELTS 7.0)

Computer Programming Skills: Python, MATLAB, C, C++, R

Computer Tools: LaTeX, Github, Linux, ROS, SolidWorks, Altium Designer

Hobbies: Martial Arts, Table Tennis, Basketball