Liyu Cao

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EDUCATION

Hong Kong University, School of Computing and Data Science **Hong Kong**

PhD of Statistics, Department of Statistics and Actuarial Science *Sep 2025 - Present*

- **Supervisor:** Dora Y. Zhang.
  Research Interest: Informatics; Generative Models; Statistical Machine Learning.
- **Relevant Coursework**: STAT6008 Advanced Statistical Inference, STAT6009 Research Methods in Statistics, DATA8014 Principles of Deep Representation Learning, COMP9602 Convex Optimization.
  Teaching Duties: STAT8020 Quantitative strategies and algorithmic trading, STAT6016 Spatial Data Analysis.

Nankai University, School of Physics **Tianjin, China**

Bachelor of Physics *Sep 2021 - July 2025*

- **GPA & Honors:** 3.84/4.00 (1/36); 1st Honor Graduate; National Scholarship, Ministry of Education, China (Top 1%); Scholarship of Public Interests and All-Round Capability (Top 5%); Academic Excellence Scholarship (Top 10%); Academic Progress Scholarship (Top 10%); Merit Student of Nankai University (Top 1%).
- **Physics Coursework**: (Graduate Level) Quantum Field Theory, Elements of Differential Geometry, Lie Groups and Lie Algebras, General Relativity, Particle Physics, Statistical Mechanics, Advanced Quantum Mechanics; (Undergraduate Level) Quantum Mechanics I and II, Thermodynamics and Statistical Physics, Soft Condensed Matter Physics, Computational Physics, Group Theory, Deep Learning and Computer Vision, Special Functions.
  Statistics Coursework: Python and Machine Learning, Statistical Computing, Stochastic Process, Natural Language Process, Multivariate Statistics, Bayesian Statistics, Data Structure and Algorithms, Real Analysis, Efficient Machine Learning, Time Series Analysis, Mathematics Statistics, MATLAB and Classical Statistics.

University of California Berkeley **Berkeley, CA**

Berkeley Global Access *Aug 2023 - Dec 2023*

- **GPA: 3.93/4.00 Relevant Coursework: (A+, 1%)** Introduction to Probability at an Advanced Level, **(A+, 1%)** Optimization Models in Engineering, (A-, 25%) Introduction to Statistical Computing, (A, 10%) Introduction to Artificial Intelligence.

Nankai University, School of Finance (Minor) **Tianjin, China**

Bachelor of Finance *Sep 2022 - July 2025*

- **GPA:** 3.60/4.0; **Coursework**: Financial Engineering, Probability Theory, Econometrics I, Econometrics II, Corporate Finance, Investment, International Finance Theory.

RESEARCH EXPERIENCE

Hong Kong University, Department of statistics and Actuarial Science *Sep 2025 – Present*

- Research group of Professor Dora Y Zhang.
- Project: Conducted genetical + epidemiological research using UK Biobank data to investigate associations between genetical health-related exposures and disease outcomes. Applied prediction and survival analysis, interpreted academic literature, and casual mediation controls to support evidence-based conclusions for G×E statistical research.

Duke University, Department of Statistics Science *May 2024 – Dec 2024*

- Research group of Professor Li Ma.
- Project: Research on different generative models and neural networks with their ability in microbiome data generation, especially on large dataset generation. Use large computing clusters for high-performance computing at American Gut Dataset. Use bioinformatics analysis to evaluate the quality of generated data.

University of California Berkeley, Department IEOR *Aug 2023 - Dec 2023*

- Research group of Professor Ying Cui.
- Project: Research on the optimization under uncertainty, deploying a semi-smooth Newton method solving risk-awareness optimization model about neural network, comparing the running time and solutions to different solvers, especially on its application in non-convex optimization.

Fudan University, School of Economics, Summer Research Project *June 2023 -Sep 2023*

- Research group of Professor Weiping Zhang.
- Project: Based on the full A-share database, we implemented deep learning models to predict prices, and run backtest under prediction-based monthly portfolio adjustment strategy.

Nankai University, School of Physics, Key Laboratory of Functional Polymer Materials *Nov 2022 -Apr 2023*

- The research group of Professor Yao Li.
- Project: "Active Topological Glass under Ellipsoidal Confinement", rated as a national innovation and entrepreneurship project posted at the 21st National Condensed Matter Theory and Statistical Physics Conference in China, using molecular dynamics simulation to predict the topological condensed behavior in polymers.

PROFESSIONAL EXPERIENCE

Simplicity Capital Limited **Hong Kong**

Quantitative Research Analyst, Simplicity AI teams *Feb 2026 -Present*

- Assisting in the development and maintenance of quantitative analysis tools and models for internal research purposes, including the analysis of historical market data, asset price performance, attribution analysis and related risk management;
- Assisting with AI based development based on publicly available data and the Company's internal data, and preparing research outputs and analytical results for internal reference and investment on global market.

Chasing Security **Chang Sha, China**

Investment Research Analyst, Alternative Investment Strategies, Chasing Security *Dec 2022 -Feb 2023*

- Responsible for investment research on industries and companies related to alternative equity investment in the primary market.
- Proficient in databases such as Wind and participated in the company's stocks, bonds, and public offerings.

HONORS

The 36th Chinese Physics Olympiad: 5th place of Hunan Province in Senior 2 Group *Sep 2019*

- Take a comprehensive exam on general physics and the four significant mechanics, ranked 5th in the theoretical exam.

The 37th Chinese Physics Olympiad: 1st prize of Hunan Province *Sep 2020*

- Take a theoretical exam on general physics and the four significant mechanics and an experimental exam on basic physics experiments.

Nankai University Physics Academic Ability Competition:1st place *Apr 2022*

- Searched and studied Chinese and English literature and prepared presentation reports on 17 topics by constructing theoretical models and verifying experimental phenomena.
- Conducted topic presentations and defenses for pros and cons and won the best player in the finals.

Chinese Mathematics Competitions: 1st prize *Nov 2022*

- Take exams related to calculus, field theory, and infinite series. Won the 1st prize in the Tianjin area.

International Quant Championship of WorldQuant: Silver Medal *May 2023*

- Through platform functions, construct momentum, volatility, valuation factors, and backtest-related ideas.

LEADERSHIP

Nankai University School of Physics Academic Department **Tianjin, China**

President of Academic Department *Sep 2022 – Sep 2024*

- Organized many large-scale lectures and received lectures from academicians and outstanding Chinese Academy of Sciences scholars, sharing cutting-edge physics academic research.

Fudan University Quantitative Investment Association **Shanghai, China**

Member of Academic Department *Mar 2023 – Aug 2024*

- Organized experience-sharing sessions and seminars on quantitative research and trading, summarized quantitative finance interview questions and held math and brain teaser competitions.

Nankai Financier **Tianjin, China**

Leader of the 2024-2025 year *Mar 2023 – 2025*

- Organized lectures and seminars on financial internship and working experience, sharing knowledge about investment banking, quantitative research, and industry research.

SKILLS & INTERESTS

Technical: AI Agent, C++, Python, MATLAB, R, Mathematica, Linux, Julia

- AI agent: Proficient in Harness agentic AI tools including Claude Code and Codex, giving comprehensive understanding in skills and vibe coding, skilled in leveraging AI in research, quantitative analysis, investment decision and data visualization. Reframing the workflow with multi-agent collaboration.
- Python: Main working language, with abilities in basic LLM training, quantitative frame developing, package implementing and statistical test. Using Python to implement a genetic algorithm package. Implementing all generative work of DDPM and Flow Matching, and its training work.
- C++: Have the foundation of C++ data structure programming, use C++ to simulate the Monte Carlo algorithm, and modify the source code of the molecular dynamics simulation software LAMMPS according to research needs.
- Mathematica: Mastered the Wolfram language, completed calculation tasks of various tensors of differential geometry manifolds and general relativity; Have experience in using special functions to implement Quantum filed theory calcultions.
- UNIX: Master Linux systems using the polymer simulation software LAMMPS to simulate the non-equilibrium behavior of polymers and colloids, able to run commands through SLURM.
- Julia: Use Julia programming language to implement nonconvex optimization algorithms in the research.
- R: Have lots of coursework and project experiences in R. Have experience using bioinformatic packages and relative bioinformatics analyzing tools to conduct microbiome data analysis.

Interests: Photography and Aerial Photography, Running, Swimming, Volleyball, Ping Pong, Mixology

English Ability: Tofel Score: 101; GRE Score: 320.