

# Yiling Cao

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## EDUCATION

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### New York University, Shanghai (NYUSH)

Expected 06/2025

*Major in Applied Mathematics and Data Science (Artificial Intelligence track)*

- Overall GPA: **3.73/4.0**; Major GPA: **3.94/4.0**
- Research Interest: **Operation Research, Applied Mathematics**
- Related Courses: Multivariable Calculus, Honor Analysis I, Probability and Statistics, Honor Linear Algebra; Numerical Method I (PhD level course), Machine Learning, Data Structure, Econometrics; Discrete Mathematics, Computer System Organization.
- Programming: Proficient in Python, Julia, MATLAB, MySQL, and Stata

## RESEARCH AND PROJECT

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### A Second-order Optimization Package for Nonlinear Programming

09/2023 – present

*Undergraduate Research, Advisor: Prof. Ye Yinyu, Dept of Engineering, Stanford University.*

- Expand algorithms such as DRSOM (a Dimension Reduced Second-Order Method) and HSODM (Homogenized Quadratic Model and A Second-Order Descent Method) for constrained problems into the existing open source DRSOM.jl library in Julia.
- Summarized and presented 20+ latest papers to Prof. Ye during weekly meetings.

### Fine Tuning Stable Diffusion Model With LoRA

02/2023 – 05/2023

*Undergraduate Research, Advisor: Prof. Li Guo, Dept of Computer Science, NYUSH.*

- Finished reconstructing the stable diffusion model on the quickdraw dataset from google creative lab including the realization of *Multi-Layer Neural Networks and CNN*.
- Fine-tuned the model to generate images of a specific style: generated quite a few visually satisfying images using the stable-diffusion-v1.5 model with the trained LoRA model added on top; guided generation results closer to ground truth images.

### Calligraphy AI with Machine Learning methods

06/2022 – 01/2023

*Undergraduate Research, Advisor: Prof. Gus(Guangyu) Xia, Dept of Computer Science, NYUSH.*

- Collected and constructed a graphic database of calligraphical handwriting pattern data with distance matrix.
- Applied graphical segmentation methods to identify calligraphical handwriting and generated new calligraphical styles which fit individuals' writing patterns more.

### Optiver Global Programming Competition - Ready Trader Go

01/2023 – 03/2023

- Adopted the composite scheme of LightGBM and connected neural network (in which, the neural network model uses KNN to layer the training data to ensure that stocks of different volatility levels in each layer are balanced) to build a new automatic trading model, and ranked top 200 among 2000 teams in the world.

## INTERNSHIP

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### Shanghai Haisheng Private Equity Fund Management Co., Ltd.

06/2023 – 08/2023

*Quantitative Research Assistant*

- Contributed to the development and optimization of statistical arbitrage strategies using Python for data analysis and model building; gathered and cleaned stock market data, performed data processing by the Pandas library.
- Applied machine learning algorithms such as Random Forest and Support Vector Machines for stock price prediction, comparing and optimizing them against traditional models.
- Assisted in risk management and portfolio optimization, utilizing the Markowitz model and covariance matrix for asset allocation and risk analysis, achieving a 10% increase in annualized returns and reducing maximum drawdown.

### DBS Bank (China), Shanghai

07/2022 – 09/2022

*Data Analysis Intern, Technology Operations Department*

- Responsible for data cleaning and transformation to ensure the accuracy and completeness of international trade finance transaction data by utilizing Python and the Pandas library.
- Contributed to the development of a machine learning-based predictive model by using regression algorithms from the Scikit-learn library to establish a predictive model between trade finance demand and market variables, aiming to improve the efficiency of international trade finance approval processes and mitigate risks.

## EXTRACURRICULAR ACTIVITIES

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- The head of *TEDxNYUShanghai*: successfully invited 21 global leaders to join, attracting 800+ visitors in 2021-2023.
- Academic Assistant of Mathematics: provided students with after-school teaching support and carried out targeted group intensive counseling regularly.