# Sen Yang

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## Education

**New York University**, Stern School of Business — Sept 2018 – Aug 2025

- Ph.D. in Operations Management
- Advisors: Jiawei Zhang, Divya Singhvi; GPA: 3.8/4
- **Research Interest:** Machine Learning, Stochastic Optimization, Convex Optimization, Online Learning

**The Chinese University of Hong Kong** — Sept 2014 – Jun 2018

- B.S. in Mathematics, graduated with Honours, First Class; GPA: 3.77/4
- Admission Scholarship – Mainland: tuition fee waived for 4 years

## Experience

**Cubist (Point72)**, Quantitative Research Intern – NYC, NY — Sep 2025 – Feb 2026

- Built **AlphaBot**, a closed-loop multi-LLM agent system for systematic alpha discovery on US equities. Identified **80+ significant meta-alphas** across Momentum, Mean Reversion, Liquidity, Information Flow and other Risk Factors, then expanded into broader downstream alpha families with automatic code implementation; across the three frontier model families in the ensemble, research-output quality ranks **Opus > GPT > Gemini**.
- Developed rolling-period statistical validation and robust selection pipeline (odd/even split overfitting controls) to minimize overfit-to-regime.
- Trained ensemble prediction models combining surviving alphas across regression families, loss functions, and targets – promising Sharpe on both large- and small-cap US equities.

**Optiver US**, Quantitative Research Summer Intern – Chicago, IL — Jun 2024 – Aug 2024

- Underwent comprehensive training in option theory and led a project aimed at advancing volatility change rate (VCR) estimation for 0-dte SPXW
- Developed and optimized the VCR estimation workflow, pinpointing essential evaluation metrics and pivotal features through advanced feature engineering
- Implemented a novel dynamic rolling window algorithm and applied smoothing techniques, ultimately boosting the $R^2$ from 0.23 to 0.44

## Personal Projects

**AlphaBot – Personal Deployment** (joint with Beier Liu) — Jan 2025 – present

- Independent deployment of the AlphaBot architecture on mid-frequency crypto trading outside Cubist as a cross-market validation. **18-month live track** on a self-funded $10K testing account; public performance dashboard at dash.300k.xyz/group/300kinvestorshowcaseaccounts (set time range to Jan 1, 2025 for the full track).
- Same agent architecture as the Cubist deployment; different market, same scaffolding produces surviving factors – evidence that the system is doing real work rather than overfitting to a single market regime.

**IvorySquare** (joint with Han Yan) — Apr 2026 – present

- Designed **IvorySquare**, a framework that treats peer-reviewed methodology – across finance, accounting, economics, and operations research – as a first-class tool surface for LLM agents. Skills are paper-derived, citation-grounded, and gated by purpose-built evaluation harnesses; the human-expert layer remains disjoint from engineering through declarative persona contracts. github.com/SenYangOM/IvorySquareSolutions
- Architected the skill graph as two coupled tiers: a foundational concept layer at textbook-subsection granularity under prerequisite ordering, and a paper-derived methodology layer with formal implementations, worked-example replication, and line-item citation provenance. Both tiers expose declarative MCP and OpenAI tool surfaces from one library.
- Motivating research direction: *academic citation networks as a structured post-training substrate for tool-using LLMs* – each skill supplies both a tool-use trace and a verifiable ground-truth signal, and the citation topology

gives a natural curriculum from primitive methods to composite ones.

## Research Thesis

**Adaptive Gradient Descent Algorithms for Online Optimization Problems in Operations**, Sen Yang, Jinzhi Bu, Siyi Wang

- Developed adaptive online stochastic gradient descent algorithms for non-stationary environments and achieved state-of-the-art sublinear regret even when environmental variation is unknown. Demonstrated applications in multi-product inventory control, portfolio selection, and other online convex optimization problems.

**Online Gradient Descent Algorithm for Multi-Item Ecommerce Order Fulfillment**, Sen Yang, Divya Singhvi, Jiawei Zhang

- Developed online gradient descent algorithm for large scale fulfillment problem, utilizing the difference between primal solutions and actual fulfillment decisions to maintain dual prices for inventory

## Additional Experience And Awards

**Instructor, NYU Stern 2022 J-term:** Taught course Operations Management; Evaluation 4.0/5

**Funding Master Gold Medal for Graduation Students, WS College, CUHK**

## Technologies

**Languages:** Python, MATLAB.