Alex Huang

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Education

MS **University of Chicago**, Applied Mathematics   Sept 2022 – May 2025
- GPA: 3.9/4.0
- Selected Coursework: Functional Analysis, Online Learning, Combinatorics, Algorithms, Nonlinear Optimization, Machine Learning, Deep Learning Systems, Computer Vision, Numerical Linear Algebra

BS **Columbia University**, Operations Research: Financial Engineering   Sept 2018 – June 2022
- Minor: Applied Mathematics
- GPA: 3.95/4.0; Magna Cum Laude, Tau Beta Pi (Honors Society Inductee)
- Selected Coursework: Real Analysis, PDE, Game Theory, Stochastic Processes, Statistics, Linear & Convex Optimization, Simulation Modelling, Applications Programming

Research Experience

Research Intern – **Chicago, Illinois**   Mar 2025 – present
Advised by Dr. Pranav Nuti (Postdoc) and Prof. Rad Niazadeh
- University of Chicago Booth School of Business
- Working on relaxing the uniform random arrival order assumption in secretary problem variants, specifically for matchings over edge-weighted bipartite graphs with vertex arrivals
- Developed an optimal algorithm for the online edge-weighted bipartite matching problem with adversarial grouping that extends to the continuous setting

Master's Thesis – **Chicago, Illinois**   Sept 2024 – Apr 2025
Advised by Prof. Cong Ma
- Studied convergence properties of scaled gradient descent (ScaledGD) and investigated performance for low rank adaptation (LoRA) fine-tuning in large-language models
- Investigated impact of condition numbers and different initialization strategy on performance

Work Experience

Machine Learning Engineer, Fireball Information Technologies – New York, New   July 2022 – Jan 2024
York
- Developed a ray casting module that utilizes digital elevation models (DEMs) and camera metadata to both calibrate cameras and pinpoint fires in positive detections
- Assisted in developing and fine-tuning the ML model that forms the core wildfire detection model; developed additional machine learning models to reduce false positives

Independent & Course Projects

Modeling NYC Taxi Profitability – **New York, New York**   June 2021
Joint work with Dr. Aapeli Vuorinen
- Analyzed NYC Open Data on taxi trips to model neighborhood-level profitability based on discounted future-profits that accounts for probable next destination via a PageRank-like concept

Teaching

IEOR 4307 (Statistics and Data Analysis) Teaching Assistant   Fall 2020
Columbia University; Instructor: Kaizheng Wang

IEOR 3609 (Advanced Optimization) Teaching Assistant   Spring 2021
Columbia University; Instructor: Shipra Agrawal

Volunteering

Head Cook/Kitchen Organizer, St. Stanislaus Kostka Church – Chicago, Illinois   Sept 2023 – June 2024
- Committed six hours every Monday for eight months, while training and onboarding new volunteers to sustain kitchen operations
- Organized and served meals for over 150 community members per session during Chicago's migrant crisis

Skills

Programming Languages & Databases: Python, PostgreSQL

Libraries & Frameworks: Torch, scikit-learn, pandas, NumPy, Matplotlib, networkx, others

Other Interests: generative image & video models, cooking, competitive Tetris, tennis