Joshua Lin

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Education

Princeton University, A.B. Mathematics (Expected) Aug 2023 - May 2027

Minors in Computer Science, Statistics & Machine Learning *GPA: 3.8/4.0*

– Relevant Coursework: Linear & Nonlinear Optimization†, Mathematical Machine Learning†, Functional Analysis†§, Algorithmic Game Theory, Operating Systems, Probability & Stochastic Systems, Financial Mathematics (with Itô Calculus).

– Awards & Activities: Princeton Physics Pyka Memorial Prize for "promise in independent research," ACM Competition Chair, Portfolio Optimization at Paragon Global Investments, Tour Director for the Princeton Debate Panel.

† Denotes graduate coursework. § Denotes Fall 2025 coursework.

Experience

Numerical Optimization Researcher Oct 2024 - Present

Princeton Astrophysical Data Laboratory *Princeton, NJ*

– My principal goal is to find "good" approximations for a particular high-dimensional ($\approx 10^{12}$ parameters) nonconvex mixed-integer allocation problem. My current approach combines GNNs and RL algorithms to learn robust solutions.

– My work, selected for USRP funding, will direct the Prime Focus Spectrograph's second-year exposures. [The PFS is an international consortium of over twenty-five universities and national laboratories to study large-scale galaxy evolution.]

Directed Reading Program Jun 2024 - Aug 2024

Princeton Mathematics Department *Hybrid | Princeton, NJ*

– Accelerated study of topics in general relativity and theoretical cosmology, with the requisite semi-Riemannian geometry.

– Led by Anthony Coniglio and supervised by Professor Sergiu Klainerman.

Mathematics Teaching Assistant Jun 2024 - Aug 2024

Jane Street Capital *New York, NY*

– Taught topics in probability, combinatorics, and number theory at the Academy of Mathematics and Programming.

– Facilitated probability games, market-making simulations, and the Electronic Trading Challenge.

Computational Physics Research Intern Jan 2023 - May 2023

NASA Jet Propulsion Laboratory *Pasadena, CA*

– Developed numerical and analytical methods to approximate the ages of lithospheric bands, identify regions of geologic co-/re-activation, and classify surface fractures in Europa's nondeformed and chaos terrains.

– Presented at NASA-JPL summer research conference to members of the *Europa Clipper* physics team.

Projects

Emergency Signaling System Nov 2023

Top Prize, HackPrinceton *Princeton, NJ*

– Developed "Moco" to discretely execute preset emergency calls, texts, and other customizable actions, triggered by customizable wrist gestures pre-calibrated with iOS app.

– Routed real-time data streams from Apple Watch accelerometer/gyroscope to server for gesture matching.

Automated Securities Trader July 2023

Top Prize, Jane Street Electronic Trading Challenge *New York, NY*

– Engineered stochastic models to forecast time series through order book data, conducting six hours of live market making.

– Interfaced with backend AWS servers through WebSocket API to exchange bonds, stocks, and ETFs at high frequency.

Skills, Interests, & Awards

Skills	Languages: Python, C, C++, x86 Assembly. Libraries: CVXPy, PEPit, Tensorflow, Pandas, Scipy.
Interests	Mathematical optimization; statistical learning theory; asymptotic statistics; physics-based machine learning.
Awards	Bill and Melinda Gates Scholarship, USAPhO Semifinalist with Honorable Mention, Wells Fargo Wealth Management Competition National Champion.