# Nikhil Devanathan

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## Education

**M.S. Electrical Engineering**
*Stanford University,* *2022–present*
Coursework includes: Convex Optimization II (EE 364B), Numerical Linear Algebra (CME 302), Stochastic Methods in Engineering (MATH 228), Machine Learning (CS 229)

**B.S. Math**
*Stanford University,* *2020–present*
Coursework includes: Probability III (MATH 230C), Theory of Statistics III (STATS 300C), Mathematical Finance (MATH 238), Randomized Algorithms and Probabilistic Analysis (CS 265)

## Experience

**AI Labs Intern**
*AI Labs, BlackRock, Palo Alto,* *Jun 2023–present*
Optimization projects to support portfolio management
- Delivered risk reductions to multi-asset-class portfolios
- Developed an algorithm and tool for efficient performance attribution on portfolios
- Designing and testing methods to reduce transaction costs
- Working to improve utilization of available liquidity

**Student Researcher**
*Information Systems Lab, Electrical Engineering, Stanford,* *Jun 2022–present*
Novel first-order method research with Prof. Stephen Boyd
- Implemented a performant step method for an in-house convex optimization solver
- Proved convergence to optimal value for a general family of convex optimization algorithms

**Technical Intern**
*Chemical and Biological Signatures Group, Pacific Northwest National Laboratory,* *Jun–Aug 2021*
Mass over charge (M/Q) simulation optimization
- Optimized gas molecule collision simulation code to run 140x faster on high-performance computers

**Technical Intern**
*Battery Materials Group, Pacific Northwest National Laboratory,* *Jun–Aug 2019*
Assembly of organic redox molecule database
- Scraped gigabytes of organic molecule structure data
- Identified a subset of organic molecules for use in redox flow batteries

## Teaching

**Teaching Assistant**
*EE 364A (CME 364A), Convex Optimization I* *Jan–Mar 2023*

**Teaching Assistant**
*EE 263 (CME 263), Linear Dynamical Systems* *Sep–Dec 2022*

## Papers

**2023**
- Efficient Shapley Performance Attribution for Least-Squares Regression, *arXiv preprint*
- Polyak Minorant Method for Convex Optimization, *arXiv preprint*
- The Role of Ion Rotation in Ion Mobility: Ultrahigh-Precision Prediction of Ion Mobility Dependence on Ion Mass Distribution and Translational to Rotational Energy Transfer, *The Journal of Physical Chemistry A*