VISHAL G. RAMAN

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EDUCATION

University of California - Berkeley(3.9) *August 2019 - Present*
Majors: *Mathematics, Computer Science*

Renyi Instutite - Budapest Semesters in Mathematics(4.0) *August 2020 - May 2020*
Coursework: *Advanced Combinatorics, Algebraic Topology*

WORK/RESEARCH EXPERIENCE

IMC Trading, Software Engineering Intern *Summer 2021*
Developer on the FICC/Index Strategy team; worked on the component that computes and publishes several different toxicity signals associated with trade events. Conducted data analysis to optimize parameters for trade-through toxicity signals.

UC Berkeley, Research Intern *Spring 2021*
Guided research in statistics/partial differential equations under the supervision of Tyler Maltba. Used sparse regression and physically-informed neural networks(PINN) in order to render probability density functions(PDFs) or cumulative distribution functions(CDFs) for stochastic dynamical systems.

Renyi Institute, Research Intern *Fall 2020*
Group research in convex geometry under the supervision of Gergely Ambrus. Studied relaxations of Helly's theorem in order to characterize transversal properties of families of convex sets.

PROJECTS

Pizza Market Making *Summer 2021*
Autotrader competition at IMC Trading - handles multiple correlated symbols, hitting and quoting, arbitrage detection, etc. Uses volume/price offsets, position management, Volume Weighted Average Price(VWAP) valution.

Blackjack Markov Desicion Process *Winter 2020*
Models the Blackjack card game as a Markov Decision Process (MDP) in order to calculate optimal move tables without simulation.

Geodesic Convex Optimization *Spring 2021*
Reading and implementation project covering differential and Riemannian geometry, geodesic convexity, and applications to non-convex optimization problems such as computing the Brascamp-Lieb constant and the operator scaling problem.(CS 270 at Berkeley)

RELEVANT COURSEWORK

Computer Science - *61C: Computer Architecture(IP), 227: Convex Optimization(IP), 186: Database Systems, 188: Artificial Intelligence, 189: Machine Learning(IP), 270: Combinatorial Algorithms*
Math - *202A: Measure Theory and Topology, 202B: Functional Analysis, 214: Differentiable Manifolds, 222AB: Partial Differential Equations, 258: Harmonic Analysis, 279: Stochastic PDEs (IP)*
Statistics - *135: Mathematical Statistics, 151A: Linear Modeling(IP), 218A: Probability Theory, 218B: Stochastic Processes*
IP denotes courses in progress, 200+ denotes graduate level courses

HONORS

William Lowell Putnam Mathematical Competition - Top 500 *Winter 2020*

American Invitational Mathematics Exam(AIME) Qualifier *Spring 2019*

United States of Olympiad Physics Olympiad (USAPhO) - Honorable Mention *Spring 2019*

United States of America Computing Olympiad(USACO) - Gold Division *Spring 2018*

Programming Languages: Python, Java, C++, R, SQL, MongoDB, LaTeX
Libraries/Frameworks: NumPy, pandas