

VISHAL G. RAMAN

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EDUCATION

University of California - Berkeley(3.9)

August 2019 - Present

Majors: *Mathematics, Computer Science*

Renyi Institute - Budapest Semesters in Mathematics(4.0)

August 2020 - May 2020

Coursework: *Advanced Combinatorics, Algebraic Topology*

WORK/RESEARCH EXPERIENCE

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.

UC Berkeley, Research Intern

Spring 2021

Guided research in statistics/partial differential equations under the supervision of Tyler Maltba. Use 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.

IMC Trading, Software Engineering Intern

Summer 2021

Developer on the FICC/Index Strategy team to implement the system that handles toxic Trade-Through events. Conducted data analysis to optimize parameters for Trade-Through toxicity signals.

PROJECTS

Blackjack Markov Decision 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)

Pizza Market Making

Summer 2021

Autotrader competition at IMC Trading - handles multiple correlated symbols, hitting and quoting, arbitrage detection, etc. Uses volume/price offsets, Volume Weighted Average Price(VWAP) valuation, multithreading, etc.

RELEVANT COURSEWORK

Computer Science 61C: Computer Architecture, 186: Database Systems, 188: Artificial Intelligence, 189: Theoretical Machine Learning, 270: Combinatorial Algorithms

Math 202A: Measure Theory and Topology, 202B: Functional Analysis, 214: Differentiable Manifolds, 222AB: Partial Differential Equations, 258: Harmonic Analysis, 279: Stochastic Partial Differential Equations

Statistics 135: Mathematical Statistics, 218A: Probability Theory, 218B: Stochastic Processes

HONORS

William Lowell Putnam Mathematical Competition - Top 500

Winter 2020

American Invitational Mathematics Exam(AIME) Qualifier

Spring 2019

United States of America 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