VISHAL G. RAMAN

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EDUCATION

University of California, Berkeley *Fall 2019 - Spring 2023*
B.A. Computer Science, Mathematics (Major GPA: 3.92)
Selected Graduate Coursework: *Measure Theory and Topology, Functional Analysis, Commutative Algebra, Differentiable Manifolds, Partial Differential Equations, Harmonic Analysis, Probability Theory, Stochastic Processes, Several Complex Variables, Dynamical Systems, Mathematics of Condensed Matter Physics, Complex Manifolds, Statistical Learning Theory, Deep Reinforcement Learning, Computational Principles for High-Dimensional Data Analysis*

Selected Undergraduate Coursework: *Machine Learning, Deep Learning, Artificial Intelligence, Mathematical Statistics, Algorithms and Complexity Theory, Computer Architecture, Database Systems, Operating Systems*

RESEARCH

Berkeley Artificial Intelligence Research(BAIR) Lab *Fall 2021 - Present*
Research in theoretical aspects of deep learning and representation learning under Yi Ma.

- ***Representation Learning Through Manifold Flattening and Reconstruction***
  Michael Psenka, Druv Pai, Vishal Raman, Shankar Sastry, Yi Ma
  SlowDNN 2023, arXiv:2305.0177

Cornell University, Center for Applied Math (CAM) *Summer 2022 - Present*
Research in optimal control under Alexander Vladimirsky.

- *In Optimal Control, situations arise where the Hamilton-Jacobi-Bellman(HJB) PDE satisfied by the value function is of mixed-type(parabolic, hyperbolic, elliptic). This work proposes a novel efficient algorithm for simultaneously computing the boundary of the region for each PDE type while simultaneously solving the equations.*

WORK EXPERIENCE

IMC Trading, Chicago *Fall 2023 - Present*
Graduate Software Engineer

- *(Summer 2021) Software Engineering Intern on the FICC/Index Strategy team. Implemented the component that computes and publishes toxicity signals for several classes of products. Conducted data analysis to optimize toxicity signals for trade-through events.*

Amazon Web Services, Seattle *Fall 2022*
Software Development Engineer Intern on AWS Commerce Platform team.

- *Developed an automated dashboard to improve the visibility of metrics related to the stability and reliability of dependent services when running end-to-end testing services.*

Course Staff (UC Berkeley) *Spring 2020 - Present*

- *(Spring 2023) Head TA for CS 270: Combinatorial Algorithms and Data Structures under Jelani Nelson*
- *(Spring 2022) Reader for Math 126: Partial Differential Equations under Maciej Zworski*
- *(Spring 2020) Reader for Math 113: Abstract Algebra under Mariusz Wodzicki*

HONORS

William Lowell Putnam Mathematical Competition (Top 500) *Winter 2020*

High School Olympiad Results
American Invitation Mathematics Exam (AIME) Qualifier, United States of America Physics Olympiad (USAPhO) Honorable Mention, United States of America Computing Olympiad (USACO) Gold

Programming Languages: Python, Java, Matlab, C/C++, Rust, R, SQL, MongoDB, Haskell

Libraries/Frameworks: NumPy, pandas, PyTorch, JAX, SciPy, Boost