

# VISHAL RAMAN

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## EDUCATION

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<b>University of California - Berkeley(3.8)</b> Majors: <i>Mathematics, Computer Science</i>	<i>August 2019 - Present</i>
<b>Renyi Institute - Budapest Semesters in Mathematics(4.0)</b> Coursework: <i>Advanced Combinatorics, Algebraic Topology, Analytic Number Theory</i>	<i>August 2020 - Present</i>
<b>The College Of New Jersey(4.0)</b> Coursework: <i>Real Analysis</i>	<i>August 2018 - June 2019</i>
<b>Mercer County Community College(4.0)</b> Coursework: <i>Multivariable Calculus, Linear Algebra, Differential Equations</i>	<i>August 2017 - June 2018</i>

## HONORS

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<b>American Invitational Mathematics Exam(AIME) Invitee</b>	<i>Spring 2019</i>
<b>United States of America Physics Olympiad(USAPhO)</b> <i>Honorable Mention</i>	<i>Spring 2019</i>
<b>United States of America Computing Olympiad(USACO)</b> <i>Gold Division</i>	<i>Spring 2018</i>
<b>United States of America Mathematics Talent Search(USAMTS)</b> <i>Bronze Medalist</i>	<i>Spring 2018</i>

## RESEARCH EXPERIENCE

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<b>Renyi Institute, Research Intern</b> <i>Group research in convex geometry under the supervision of Gergely Ambrus. We study relaxations of Helly's theorem in order to characterize transversal properties of families of convex sets.</i>	<i>Fall 2020</i>
<b>UC Berkeley, Research Intern</b> <i>Guided research in statistics/partial differential equations under the supervision of Tyler Maltba, Steve Evans. We 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.</i>	<i>Spring 2021</i>

## PROJECTS

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<b>Blackjack Decision Maker</b> <i>Models the Blackjack card game as a Markov Decision Process (MDP) and finds optimal values through Value Iteration/Fixed-point iteration. The model takes in a counting strategy as user input.</i>	<i>Winter 2020</i>
<b>Adversarial Games and Multi-Agent Search</b> <i>We design agents for classic Pacman(including the ghosts), and implement minimax(w/ alpha-beta pruning) and expectimax search with custom evaluation functions(CS188 at Berkeley)</i>	<i>Summer 2020</i>

## RELEVANT COURSEWORK

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**Computer Science** - 61B: Data Structures, 170: Algorithms and Intractable Problems, 188: Artificial Intelligence, 270: Combinatorial Algorithms and Data Structures  
**Math** - 202a: Measure Theory and Topology, 202b: Functional Analysis, 250b: Commutative Algebra, 218a: Probability Theory, 218b: Stochastic Processes, 222a: Partial Differential Equations, 258: Harmonic Analysis  
*200+ denotes graduate level coursework*

**Programming Languages:** Python, Java, C++, R,  $\text{\LaTeX}$ , SQL, HTML, CSS  
**Libraries/Frameworks:** NumPy, pandas, TensorFlow, BigQuery, React.js