

Siddharth Chandrappa
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EDUCATION	
Yale University	New Haven, CT
M.S. Statistics and Data Science	2022 - 2023
<ul style="list-style-type: none">• Grade: Honors (H) - highest grade achievable; achieved Grade H in all courses taken• Courses: Applied Machine Learning and Causal Inference Research Seminar, Statistical Case Studies, Intermediate Machine Learning, Data Analysis, Bayesian Statistics, Data Science Software Systems + 7 more• Capstone: Analysis of Indian Premier League (IPL) Player Salaries and Retention Likelihood• Teaching: Taught PSYC 200: Statistics, instructed weekly labs to 10+ students, graded assignments, held office hours	
University of Cambridge	Cambridge, UK
Part III Mathematics (MMath)	2021 - 2022
<ul style="list-style-type: none">• Placed in top half of Distinctions: Distinction is equivalent to above a first-class degree• Master's Thesis: High-Dimensional Online Changepoint Detection with Heterogenous Missingness – scored a high distinction• Senior Scholar: Awarded by Trinity College, Cambridge, for outstanding academic performance• Examinations Prize: Awarded by Trinity College, Cambridge, for excellent results in Part III examinations• Courses: Mathematical Essay Paper (Research Thesis), Modern Statistical Methods, Concentration Inequalities, Topics in Statistical Theory, Astrostatistics, Information Theory and Topics in Convex Optimisation	
Mathematics BA (Hons)	2018 - 2021
<ul style="list-style-type: none">• Grade: First Class Honors in Final year of Studies• Senior Scholar: Awarded by Trinity College, Cambridge, for outstanding academic performance• Adrian Weller Prize: Awarded for an outstanding essay on the Application of Mathematics to Finance and Economics• Courses: Principles of Statistics; Mathematics of Machine Learning; Stochastic Financial Models; Linear Algebra; Numerical Analysis II; Probability; Statistics, Vector Calculus, Analysis + 17 more.	
RESEARCH EXPERIENCE	
Data Scientist / Junior Researcher <i>Bridgewater Associates (AIA Labs)</i>	Westport, CT <i>Feb 2024 - Present</i>
<ul style="list-style-type: none">• Worked in AIA labs (formerly the Machine Learning Team), reporting to Professor Jasjeet Sekhon.• AIA Labs is an in-house venture at Bridgewater Associates that is focused on using AI to generate returns in markets• I take part in various projects in machine learning projects, building on research ideas and finding ways to optimize their use in finance. Report findings weekly to the wider team.	
Data Scientist / Junior Research Intern <i>Bridgewater Associates</i>	Westport, CT <i>Jun - Aug 2023</i>
<ul style="list-style-type: none">• Worked in the Machine Learning Team under Professor Jasjeet Sekhon• Designed & deployed C++ implementation of hierarchical shrinkage, a proposed post-hoc extension to random forests that aims to make predictions based on weighted means of ancestor nodes• Optimized the package for production-level performance, including an independently identified modification to the generic implementation, reducing runtimes by 50% by augmenting tree-node memory storage	
US Olympic and Paralympic Committee Data Challenge <i>Yale University</i>	New Haven, CT 2022
<ul style="list-style-type: none">• Will be presenting at the US Olympic and Paralympic Performance Innovation Summit, including to the Selection Committee on a data-driven approach to select the optimal US Olympic Team for the Paris Olympics after placing first place in the 2024 US Olympic and Paralympic Committee (USOPC) Data Challenge• Created an algorithm in R to systematically analyse past athlete data and develop a strength score for each athlete. Used this to jointly optimize teams over participating countries via an iterative traversal approach.• Trained a stochastic model, analysing over 200,000 combinations to systematically select the optimal USA Gymnastics team, conditional on various performance desiderata (e.g., Team medals, overall medals, a mixture of both)• Presented my approach at the UConn Sports Analytics Symposium (UCSAS) to Professors in Sports Analytics and committee members in the USOPC	

Master's Thesis: Modern Changepoint Analysis <i>University of Cambridge</i>	Cambridge, UK 2022 - 2023
<ul style="list-style-type: none"> Research thesis in modern changepoint analysis supervised by Prof. Richard Samworth Investigated algorithms for sparse online changepoint detection in high dimensions with heterogenous missingness Developed 'MissOcd', naturally extending the work of Samworth et. al on online changepoint detection to build an algorithm that incorporated missingness constraints Mathematically proved analogous statistical guarantees on the run length under no changepoint (the patience) and expected detection delay after a changepoint. Analysis hinged on separating into events where missingness was low to leverage the original paper and events with high missingness, which I then showed had vanishing probability Augmented the existing R package 'ocd' to run 'MissOcd' and ran empirical assessments demonstrating superior performance over a naïve imputation-based alternative 	
Preference Theory - Essay in Mathematical Finance <i>University of Cambridge</i>	Cambridge, UK Jun - Oct 2021
<ul style="list-style-type: none"> Awarded the Adrian Weller Prize for my essay on the Application of Mathematics to Finance and Economics supervised by Prof. Tehranchi Analyzed Von-Neumann Morgenstern (VnM) preference theory, with common extensions and the subsequent directions of contemporary research in the area, amalgamating knowledge for a synthesized view of the field Laid out all the axioms clearly and concisely, with illustrative examples and a derivation of the existence of a utility function from first principles and subsequent developments (Savage Preferences) Documented well-known issues with the axioms (e.g., Allais, Ellsberg Paradox) and a handful of more recent remedial frameworks in the field, specifically Gilboa's maxmin expected utility and an example of new research in this direction 	
PROFESSIONAL EXPERIENCE	
Software Engineering Intern <i>Microsoft</i>	London, UK Jun - Aug 2022
<ul style="list-style-type: none"> Achieved a 25% increase in testing-to-deployment efficiency for Perimeta, a key Microsoft Voice Over IP solution, by creating custom business intelligence metrics in Python, statistically profiling time distribution of critical steps Circumvented 4+ hour VM boot-ups by modifying the CI testing pipeline with custom BASH, Python, and C++ scripts Received return offer for full-time Software Engineering role 	
Software Engineering Intern <i>Microsoft</i>	London, UK Jun - Aug 2021
<ul style="list-style-type: none"> Developed advanced security feature to support Microsoft's VoIP technology, which handles 1.2 billion daily call events by creating Python and Bash scripts to improve password storage and management, eliminating non-secure file writes Independently identified breaking memory bug affecting 5% of products; engineered solution rolled out in subsequent release Prototyped implementation of voice recognition in VSCode, leading to a 50% productivity boost for visually impaired coders; won student hackathon and presented to senior product leaders for implementation post-internship Received return offer for full-time Software Engineering role 	

PROJECTS	
Analysis of Indian Premier League (IPL) Player Salaries and Retention Likelihood <i>Yale University</i>	New Haven 2023
<ul style="list-style-type: none"> Created models that used advanced or atypical performance metrics to predict player salaries in upcoming seasons as well as their chance of being retained for Capstone Project at Yale Built an aggregation tool to parse ball-by-ball data from games in the IPL and create custom performance metrics, going beyond traditional measures reported by the industry (e.g., performance during powerplays, economy rate in pressure situations) Regression results strongly showed promise with significant prediction signals, though advanced metrics rarely yielded much incremental gain. Retention prediction had a high true negative rate compared to a more mixed true positive rate, which was expected given that, for example, specific details about the player's personal life could not be included. 	
Projects in Computational Mathematics <i>University of Cambridge</i>	Cambridge, UK 2019 - 2021
<ul style="list-style-type: none"> Completed 8 independent projects in computational mathematics across a wide variety of topic areas, writing efficient MATLAB code and making mathematical and statistical insights on results Projects: Protein Comparison in Bioinformatics, Variable Selection and the Bias-Variance Trade-off, Random Binary Expansions, Parabolic Partial Differential Equations, Padé Approximants, Sensitivity of Optimisation Algorithms to Initialisation, Curves in the Complex Plane, Ordinary Differential Equations 	

Automated Tool for Classical Cryptography <i>National Cipher Challenge – University of Southampton</i>		UK <i>2014 - 2018</i>
<ul style="list-style-type: none"> Built tools in JavaScript and Python to automatically solve classical ciphers, including Vigenère, BIFID, Playfair ciphers, implementing stochastic optimisation algorithms such as simulated annealing Participated in the National Cipher Challenge, which lasted 8 weeks; each week, we had to solve new ciphers as quickly as possible Placed 3rd overall in the UK (out of 1000+ competitors) and was twice invited to Bletchley Park for the Prizegiving 		
VOLUNTEERING & OUTREACH		
Executive Committee Member <i>Cambridge University Hindu Cultural Society (CUHCS)</i>		Cambridge, UK <i>2019 - 2020</i>
<ul style="list-style-type: none"> Organised events for 400+ members, such as Holi and Diwali Ball, communicating effectively with other exec members Secured sponsors for a cultural song and dance show, MASTANA 2019, that led to over £8,000 in gross inflow 		
Curriculum Developer <i>Project Sitara</i>		Bangalore, India <i>2014 - 2018</i>
<ul style="list-style-type: none"> Created detailed class plans, modifying standard mathematics lessons, making them accessible to visually impaired Class VII students in Bangalore, India. These lesson plans became the basis of these students' math education for that year. 		
TECHNICAL SKILLS		
Python (NumPy, PyTorch, Pandas), C++ (incl. Linear Algebra packages Eigen/Armadillo), R (incl. dplyr/tidyverse), MATLAB, SQL (incl. query optimization), JavaScript		
HOBBIES & INTERESTS		
Golf Cricket Trading Prediction Markets Competitive Programming Online Chess		