

Mrinank Sharma

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Education

University of Oxford

Magdalen College

- *PhD Candidate, CDT in Autonomous Intelligent Machines and Systems*

2019–Present

My primary research interest is in principled, probabilistic machine learning models and techniques which can be used to augment these.

University of Cambridge

Pembroke College

- *MEng (Hons) Information and Computer Engineering*

2015–2019

For my Masters' Project, I was awarded a *Distinction* for my work on *Differential Privacy and Approximate Bayesian Inference* with Dr Richard Turner and developed techniques to performance Bayesian learning on distributed data, applying *differential privacy* to ensure that these algorithms are appropriate in contexts where the data is highly sensitive.

Part IA: *Class I* (87%, 2nd Percentile).

Part IB: *Class I* (82%, 4th Percentile).

Part IIA: *Class I with Distinction* (88%, 1st in cohort).

Part IIB: *Distinction* (85%, 1st in cohort)

Salient Courses: • *Probabilistic Machine Learning* • *Statistical Signal Analysis* • *Deep Learning and Structured Data* • *Practical Optimisation* • *Advanced Information Theory and Coding* • *Inference* • *Computational Neuroscience* • *Learning From Data* (EdX CS1156x) • *An Optimisation-based Approach to Control*

Recognition: • *Charles Lamb Prize* (2019) • *Ronald Wynn Prize for Engineering* (2019, 2018) • *IET Undergraduate Grant* (2018) • *Kilby Prize for the Best Undergraduate Performance* (2018) • *Winifred Georgina Holgate Pollard Memorial Prize* (2018, 2017) • *Foundress Scholarship* (2018, 2017) • *Foundress Prize* (2017, 2016) • *College Scholarship* (2016) • *Reece Foundation Arkwright Undergraduate Scholarship* (2015)

Activities: • *Pembroke College AFC III XI (Captain 2018)* • *Pembroke College Badminton I Team (II Captain 2017)* • *Pembroke College Table Tennis II Team* • *Pembroke Engineering Fresher Representative* • *Socials Officer, Cambridge University Engineering Society* (2017)

Calday Grange Grammar School (CGGS)

West Kirby

- **A-Level:** 7 A* including Mathematics, Further Mathematics, Physics and Chemistry.

2008–2015

GCSES: 11 A* including English Literature, English Language, Mathematics, Physics, Chemistry & Biology.

Recognition: • *Overington Memorial Prize* (2016) • *Sergeant, CGGS Combined Cadet Force RAF Section* (2014) • *Arkwright Sixth Form Scholarship* (2013) • *Netcraft Computing Prize* (2013) • *Best Game KS4: Codebreaker Competition* (2012)

I co-authored a **GCSE English Revision Guide** (found on Amazon) which has **sold internationally**. I was also a Senior Prefect.

Technical Experience

Computational and Biological Learning Lab

Cambridge

- *Research Assistant*

June 2019–September 2019

Research Assistant, working under Dr Richard Turner extending my fourth year project. Developed the Differentially-Private Partitioned Variational Inference algorithm which enables private, Bayesian learning in the federated learning context.

LendOne

Cambridge

- *Director*

January 2017–October 2018

LendOne was a start-up in the sharing economy space, seeking to facilitate peer-to-peer lending and borrowing of commodity items in communities through a mobile application. Through making difficult product and app design decisions, I have seen first hand how the *Law of Unintended Consequences* influences outcomes and have learnt to be wary of this. Additionally, I have gained technical experience with mobile application development as well as back-end server development.

- Cambridge Consultants**

◦ *Data Scientist*

As an intern in the *Algorithms and Analytics* group at Cambridge Consultants, I worked on developing an end-to-end system which detects stress levels from an array of biological sensors. For this project, I investigated academic literature to determine appropriate *biomarkers* (features that can be used to determine stress levels effectively) and implemented algorithms to perform extraction of these features. A number of machine learning algorithms were then applied to the feature data-set using `scikit-learn` with `Apache Spark`.

Cambridge

July 2018–September 2018
- California Institute of Technology**

◦ *Summer Undergraduate Research Fellow*

I worked for ten weeks in the *DNA and Natural Algorithms* under Professor Erik Winfree researching techniques to improve the reliability of dynamic DNA nanotechnology. I was required to assimilate a body of technical literature in a short period of time and found that patience and perseverance are crucial for this task. An open source software package, *Multistrand*, was used to simulate techniques which were thought to improve the robustness of DNA Sessaw Circuits by slowing down the rate of unwanted biological reactions (*leak*). Throughout this project, I contributed to *Multistrand* and developed a case study to provide a starting point for other researchers who wish to investigate leak reactions.

Pasadena, California

June 2017–September 2017
- Cambridge University Eco Racing (CUER)**

◦ *Embedded Software Engineer*

Working full time for ten weeks as part of the Summer Design Team, I designed and produced an *Electronic Driver Controls* system for *Evolution*, CUER's solar powered car. This involved producing a set of technical requirements for the project, developing a system approach and implementing the chosen approach. The *ARM Mbed* platform was used extensively for this body of work. As a key team member at the *European Solar Challenge 2016*, I made technical modifications in a high pressure and safety critical environment without which the vehicle would have been unable to participate in the competition. I remained involved with CUER throughout the next academic year, leading a team of three which designed an updated steering wheel.

Cambridge

June 2016–June 2017

Non Technical Experience

- Pembroke College May Ball Committee**

◦ *President (18/19), Treasurer (17/18)*

As President of Pembroke May Ball 2019, I led a committee of seventeen members to create a high quality event whilst also focusing on the wider societal impact the event. We were ranked the most sustainable Cambridge May Ball in 2019 and for the first time in Pembroke May Ball history, all workers were paid the real living wage and discounted tickets were made available to students who received a Cambridge bursary. Additionally, the event raised 3,500 GBP for charity.

As Treasurer for Pembroke June Event 2018, I was ultimately responsible for allocating a budget exceeding 100,000 GBP across many competing categories. On discovering the inadequacies of our external ticketing provider, I designed and implemented an alternative ticketing system in less than a week with an additional committee member. The June Event was well received by the guests of the event, who were particularly impressed by the quantity of food and entertainment that was provided at the event.

Cambridge

November 2017–Present
- Pembroke College Junior Parlour Committee**

◦ *Treasurer*

As the elected Treasurer for a student body of over 450 undergraduates, I was responsible for the allocation of a budget exceeding over 20,000 GBP to fund student run societies within the college. I introduced a system to increase the ease by which claims can be made as well as improved the allocation process by ensuring that all relevant information, such as the current assets of each society, is included in each application, mitigating the risk of a misuse of funds.

Cambridge

November 2016–November 2017
- MyTutor**

◦ *Online Tutor*

I have over 50 hours of experience of tutoring A-Level Mathematics and Physics through an online website. I have received excellent reviews for my lessons and garnered significant experience in communicating challenging technical concepts.

Remote

July 2016–October 2017

Technical and Personal Skills

- Experienced with Python, TeX, Git. Additionally, I am familiar with a Unix operating environment.
- Full UK Driving License.
- Significant experience with delivering technical information at an appropriate pace in an engaging manner. Experience with writing reports in a concise but also detailed way. Excellent time management and organisational skills.
- GRE (October 2018): 170/170 Quantitative Reasoning, 167/170 Verbal Reasoning, 6/6 Analytical Writing.

Interests and Hobbies

- I particularly enjoy practicing meditation and make an active effort to incorporate this into my daily routine.
- I am an voracious reader, particularly enjoying science fiction works.
- I enjoy playing football, badminton and table tennis regularly.