SHRESHTH MALIK

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EDUCATION

Magdalen College, University of Oxford | Oxford, UK **2021 – 2025**

- **D.Phil. Autonomous and Intelligent Machines and Systems CDT (Machine Learning)**
  - Advised by Yarin Gal and Stephen Roberts.

University College London (UCL) | London, UK **2020 – 2021**

- **M.Sc. Machine Learning**
  - **Distinction** (87%, Dean's List). Thesis: The Practical Challenges of Deep Active Learning.

St. John's College, University of Cambridge | Cambridge, UK **2016 – 2020**

- **M.Sci. & B.A. Natural Sciences Tripos – Physics**
  - **First Class** (Top 8%). Thesis: Predicting the Outcomes of Material Syntheses with Deep Learning.

Nagoya University | Nagoya, Japan **2017**

- **Summer Exchange** – *fully funded, selected based on academic merit.*

PUBLICATIONS & PREPRINTS [Google Scholar]

- **Shreshth A. Malik***, James Walsh*, Giacomo Acciarini, Thomas Berger, Atilim Gunes Baydin. "High-Cadence Thermospheric Density Estimation enabled by Machine Learning on Solar Imagery". *Under Review* **Sept 2023**
- **Shreshth A Malik***, Salem Lahlou, Andrew Jesson, Moksh Jain, Nikolay Malkin, Tristan Deleu, Yoshua Bengio, Yarin Gal. "BatchGFN: Generative Flow Networks for Batch Active Learning". *ICML 2023: Structured Probabilistic Inference & Generative Modeling Workshop.* [Arxiv] **Jun 2023**
- **Shreshth A. Malik***, Nora L. Eisner, Chris J. Lintott, and Yarin Gal. "Discovering Long-period Exoplanets using Deep Learning with Citizen Science Labels". *NeurIPS 2022: Machine Learning and the Physical Sciences Workshop.* [Arxiv] [Press] **Nov 2022**
- **Shreshth A. Malik*,** Matthew T. Jackson*, Michael T. Matthews, and Yousuf Mohamed-Ahmed. "Multi-modal Fusion by Meta-Initialisation". *FARSCOPE Robotics Conference 2022* | Bristol, UK. **Best Poster Award.** [Arxiv] **Jun 2022**
- **Shreshth A. Malik***, Rhys E. A. Goodall, and Alpha A. Lee. "Predicting the Outcomes of Material Syntheses with Deep Learning". *Chemistry of Materials* **2021** *33* (2), 616-624. [Paper] **Jan 2021**

SELECTED RESEARCH PROJECTS

Physics-informed Neural Thermospheric Density Modelling (Ongoing) **2023**

- Improving the accuracy of thermospheric density models for satellite operations using physics-informed machine learning. Integrated solar imagery to enable high-cadence, near-real-time predictions.

Differentiable Electron Diffraction (Ongoing) **2023**

- Enabling gradient-based refinement of protein structures by writing differentiable electron diffraction simulators. Close collaboration with domain experts to ensure physical constraints are encoded well.

Batch Active Learning with GFlowNets **2022**

- Developed novel acquisition strategies for active learning by training GFlowNets to sample highly informative batches of data points in a principled way.

Discovering Long-Period Exoplanets using Deep Learning and Citizen Science (Ongoing) **2022**

- Trained a 1-D CNN to identify exoplanets from TESS light curves, using confidence-weighted volunteer scores as labels. Resulting model enables recovery of planets missed by traditional automated algorithms.
- Model to be integrated into the citizen science project workflow in an active learning setting.

Investigating the Practical Challenges of Deep Active Learning **2021**

- Investigated the transferability of actively learnt datasets to train subsequent models (different model classes and hyperparameters). Further investigated the effect of class imbalance in the pool dataset.
- Developed an open-source benchmarking suite for evaluating active learning for text classification.
- In collaboration with Humanloop.

ACADEMIC AWARDS & FUNDING

D.Phil. Studentship | EPSRC, UK (Grant No: EP/S024050/1) **2021 – 2025**
Dean's List (top 5%) | University College London, London, UK **2021**
United Steel Companies Scholarship | St. John's College, Cambridge, UK **2017, 2018, 2019, 2020**
Summer Undergraduate Research Fellowship (CamSURF) | Caltech, Pasadena, CA, USA **2019**
Wright Prize | St. John's College, Cambridge, UK **2017**

PROFESSIONAL EXPERIENCE

Machine Learning Researcher, NASA FDL | Mountain View, CA, USA **Jun 2023 – Sept 2023**

- FDL (fdl.ai) is a public/private research partnership between NASA, NVIDIA, GCP and Trillium Tech.

Data Science Fellow, Backed VC | London, UK **Jun 2021 – Feb 2022**

- Conceptualised and built an automated tool to identify high-potential new ventures from across the web.
- Also participated in deal origination, first meetings with founders, and deal review.

Machine Learning Intern, techspert.io | Cambridge, UK **Jun 2020 – Sept 2020**

- Research-driven project developing methods for tagging biomedical texts with defined medical categories.
- Developed, trained, and deployed an explainable deep learning model (TensorFlow, AWS, Docker).

Summer Analyst, Baringa Partners LLP | London, UK **Jul 2018 – Aug 2018**

- Management consulting project for a time-sensitive trade financing deal at an investment bank.

TEACHING & COMMUNITY

Program Committee | MLDD Workshop ICLR 2023, Comp. Bio. Workshop ICML 2023
Reviewer | NeurIPS 2022, ICML 2023, SPIGM Workshop ICML 2023
Volunteer | NeurIPS 2020, Oxford UNIQ+ Graduate Access Programme 2022
Teaching & Outreach

- **Teaching Assistant**, **Bayesian Deep Learning Course** | Oxford, UK, upcoming Jan 2024
- **Interactive Intro. To ML, Royal Institution Masterclass** | Oxford, UK, Jul 2022
- **ML Research Outreach Workshop** | St Clare's School, Oxford, UK, May 2022
- **A Level/GCSE Tutor, Coronavirus Tutoring Initiative** | Virtual, Apr – Sept 2020
- **Teaching Assistant** | Cambridge Academic Partnership, Cambridge, UK, Jan – Apr 2019

SELECTED POSITIONS OF RESPONSIBILITY & INTERESTS

Hackathons [GitHub]

- **Winner**, multiple prizes totalling >$8.5k (over 900 attendees) | ETHBogota, Colombia **Oct 2022**
- **Winner**, Toucan Protocol Prize (over 800 attendees) | ETHAmsterdam, Netherlands **Apr 2022**
- **2nd Place** (over 80 submissions) | Hack Cambridge, Cambridge, UK **Jan 2020**
- **European Regional Finalist** | Citadel Data Open, London, UK **Nov 2019**
- **Winner** | Digital Manufacturing Hackathon, Institute for Manufacturing, Cambridge, UK **Oct 2019**

Data and AI Correspondent, UCL Finance and Tech Review | London, UK **Oct 2020 – Apr 2021**
Consultant, Cambridge Consulting Network | Cambridge, UK **Apr 2020 – Jun 2020**

- Developed a route-to-market strategy for a MedTech start up. Awarded **Star Consultant** award.

EnterpriseTECH Team Lead, Judge Business School | Cambridge, UK **Jan 2020 – Mar 2020**

- Led a team of six in a consulting project with an early-stage autonomous vehicle tech start up.

JCR (Student Union) Committee, St John's College | Cambridge, UK **Dec 2017 – Dec 2018**

- Elected to represent 900 students. Organised popular themed college parties three times a term.
- Initiated and organised the successful revival of an annual "June Event" for over 300 (sold out) attendees.

Sport

- **Rugby Fives:** Cambridge University Blues (1st) team (2019-20). Started as a novice in 2019.
- **Badminton:** Captain, St John's College (2017-19). League promotion under my captaincy.
- **Endurance Cycling/Running:** e.g., Niagara Falls to New York (2015), Italian Dolomites (2017), Cambridge Half Marathon (2020), Hackney Half Marathon (2022), Edinburgh Marathon (2023).

TECHNICAL SKILLS

Proficient: Python (ML, PyTorch/JAX, scientific programming, data science), Git, Slurm, Unix
Intermediate: C++, FORTRAN, AWS/GCP, Docker, JavaScript, Solidity
Exposed to: Julia, SQL, HTML, CSS