

Abhijeet Rao

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EDUCATION

University of Cambridge

MPhil Scientific Computing

Cambridge, UK

Expected September 2026

The University of Edinburgh

BSc Hons Applied Mathematics – 1st (First Class Honours)

Edinburgh, UK

July 2025

University of California, Los Angeles

Exchange year - Computational and Numerical Methods

California, USA

2023 – 2024

Relevant Coursework: Machine Learning in Python, Applied Numerical Methods, Computational Statistics in R, Dynamical Systems, Mathematical Modelling, Applied Stochastic Differential Equations, Industrial Mathematics, Probability, Statistics, Computing and Numerics, Mathematics of Finance, and Finance, Risk, and Uncertainty.

EXPERIENCE

Autodesk – Dynamics, Data Assimilation Intern

Summer 2024

Combine theoretical rigid body dynamics and experimental real world data to create a digital twin of a car-sized drone.

- Refactored 2K+ lines from functional to object-oriented architecture, reducing AWS deployment time.
- Engineered ML pipeline achieving 60% data efficiency improvement while maintaining model performance.
- Analysed adjoint method optimization for a theoretical 200% computational efficiency gain for gradient-based inverse problems.

Draup – Machine Learning Intern

Summer 2023

Language model that finds skills in job descriptions for Draup's HR CRM platform.

- Preprocessed 1,843 job descriptions using IOB tagging scheme, implementing data cleaning and batching.
- Developed 2 NER architectures: LSTM RNN and pre-trained BERT/RoBERTa transformers, comparing performance across model types.
- Optimized model performance through 6-parameter hyperparameter tuning with robust training pipeline preventing data leakage.

Endeavour Rockets – Controls and Simulations Engineer

Oct – May 2023

Stop the rotation of a rocket for stable video relay by adding a reaction wheel to counteract spin.

- Tested interface between motor controller and motor with C++ and SimpleFOC.
- Researched PID and Kalman Filter control systems in Python for reaction wheel control.
- Identified appropriate motor, controller, and battery combination to fit design specifications.

Tata Technologies – Data Science Intern

Summer 2022

Anomaly detection for battery sensor data that caused unwanted power cut off to motors in EVs.

- Engineered data preprocessing pipeline for 10,719 EV charge cycles (15 features) using pandas, ensuring data quality and consistency.
- Created optimized feature extraction system achieving 90% speed improvement, reducing processing time from hours to minutes.

PROJECTS

Hazardous Materials – Industrial Mathematics

Github Repo

Visualise the flow of gas through a room using the two dimensional advection diffusion equation.

Stochastic Resonance in Climate Models

Github Repo

Final year bachelor's dissertation in modelling ice age and warm age transitions through stochastic differential equations.

SKILLS

Programming: Python, R, C++, Git, LaTeX.

Technologies: Jupyter, PyTorch, JAX, NumPy, SciPy, scikit-learn, pandas, Matplotlib.

Interests: music production, graphic design, technology, Italian cooking, Formula One.