Abhijeet Rao

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EDUCATION

University of Cambridge — Cambridge, UK
MPhil Scientific Computing — *Expected September 2026*

The University of Edinburgh — Edinburgh, UK
BSc Hons Applied Mathematics – 1st (First Class Honours) — *July 2025*

University of California, Los Angeles — California, USA
Exchange year - Computational and Numerical Methods — *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.

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, C++, Git, Latex.

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

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