Jasamrit Rahala

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EDUCATION

Princeton University Princeton, NJ, US — **Aug 2022 – May 2026**

B.S.E in Computer Science, Minor in Mathematics — Dep. GPA 3.96

    Relevant Courses: Real/Complex Analysis, Abstract Algebra, Theory of Algorithms, Graph Theory, Probability & Stochastic Systems, Functional Prog., Logic Design, Operating Systems, Elliptic Curves, Diff Eq., Linear Algebra, Multivariable Calc., Game Theory, Research with Robert Tarjan, *Comp. Finance in C++, *Probability Theory, *Advanced Algorithm Design, *Combinatorics, *Monte Carlo Sim (*Fall '25)

Eton College Eton, Windsor, UK — **Sep 2017 – May 2022**

    A-Levels: 4 A*s in Computer Science, Maths, Further Maths and Physics
    Scholarships / Awards: New Foundation Scholar, King's Scholar, A*AA offer to Oxford University

TECHNICAL SKILLS

Languages | Python, C / C++, Java, OCaml, SQL, Swift, HTML, Java/Typescript | **Libraries** | PyTorch, NumPy, Scikit-learn, Pandas, Qiskit, React | **Systems** | Git, Linux, FPGA, ARMv8, LaTeX, Docker, AWS, Unity, Node.js

EXPERIENCE & RESEARCH

UnlikelyAI (AWS Startups) | *Machine Learning Engineer/Research Intern* — **Jul 2025 – Present**

- Developed Bayesian Knowledge Tracing system, to model users' financial literacy for Lloyds Bank's advice chatbot
- Combined neuro-symbolic reasoning, LLM-RAG, agentic orchestration for justifiable, regulatory-compliant, low-latency outputs
- Deployed using AWS, PyTorch and Datadog; Mentored by William Tunstall-Pedoe (Founder of Amazon Alexa)

Princeton University (with Prof. Robert Tarjan) | *Data Structures and Algorithms Researcher* — **Dec 2024 – Present**

- Invented new data structure to allow lock-free usage of rebalancing binary search trees "Concurrent Ziptrees"
- Design decreases contention with thread count, enabling near-linear throughput under increasing parallel workloads
- Currently working on publication with professors from Princeton, WashU and UTAustin

MIT CSAIL (MantisAI, with Prof. Manolis Kellis) | *Machine Learning Engineer/Research Intern* — **May 2024 – Aug 2024**

- Researched the understanding and alignment of embedding spaces under supervision of Professor Manolis Kellis
- Presented novel approach to map embeddings by combining Variational Autoencoders and General Procrustes Analysis
- Combined dimensionality reduction algorithms including t-SNE, UMAP, PCA to normalise and fine-tune embeddings

Imperial College London (with Dr. Cristina Hickman) | *Computer Vision Research Intern* — **Oct 2020 – Jan 2021**

- Designed and tested PyTorch neural networks for embryo viability prediction with limited, highly sensitive IVF data
- Developed few-shot learning techniques to classify 4-cell stage embryos based on survival probability

Microsoft, TeensInAI (United Nations AI for Good) | *AI Hackathon Teacher & Organiser* — **May 2019 – Sep 2020**

- Lectured mathematical foundations of AI, covering regression, clustering, neural networks to international audiences
- Produced interactive notebooks, live educational videos and demos using IBM Watson and Microsoft Azure pipelines
- Invited into HQs of Microsoft, Twitter, BBC London to explore the impact of ML

SELECT AWARDS & MEDIA APPEARANCES

Mathematics and Informatics Olympiads | *Team Captain, Coach and Organiser* — **May 2018 – Present**

- 4x British Math Olympiad Competitor and 2x Regional Math Olympiad Team Captain
- 2x British Informatics Olympiad Competitor / Coach; Princeton ICPC and Princeton ACM weekly meetings

Computational Physics Prize 2022 & 2019 | *Ising Model and Moon Landings Simulations* — **Dec 2019 – Feb 2022**

- 2022: Modelled Mars rover landings using gravity and fluid dynamics, simulation archived in the Eton College library
- 2019: Simulated phase transitions of the Ising model via Metropolis-Hastings Monte Carlo; youngest prize winner

Media Appearances | *Repeatedly interviewed by BBC, The Sunday Times, The Guardian, Mensa, Channel 4* — **June 2015 - Present**

- Youngest person in the UK to achieve 100% score in the adult Mensa IQ test (162+ IQ) aged 11 years old
- First dual King's Scholar and New Foundation Scholar in Eton College's 500-year history
- Youngest Series Finalist on quiz shows, Child Genius (2015) and Countdown (2021)

Regular volunteer at local Sikh temple, actor of Princeton South Asian Theatrics and Events Chair of Princeton's Tower Eating Club