Alexander Jenkins

Summary

Final year PhD in AI/ML with background in physics and mathematics, specialising in time series and graph signal processing, adaptive filtering, and predictive modelling of complex dynamical systems. Proven ability to ideate and translate cutting-edge research into commercial value through 2 filed patents, 7+ publications, and industry projects.

Education

Imperial College London, PhD in Artificial Intelligence and Machine Learning — Oct 2021 – Jan 2026

- Graph and time series signal processing, adaptive filters, uncertainty quantification, forecasting and imputation, spatiotemporal dynamical systems (cardiac fibrillation).
- Supervised by Prof Danilo Mandic (IEEE Fellow) and Dr Fu Siong Ng (Cardiologist).
- Research Impact & Commercial Applications:
  - 7 co-authored papers at top-tier venues (ICML, AAAI workshops) with multiple IEEE and Science journal submissions under review.
  - Developed uncertainty estimation techniques for multivariate time series (published in ICML 2025).
  - UK patent (No. 2500830.1) filed as lead inventor for cardiac fibrillation mapping technology involving signal generation with spatiotemporal graph neural networks (featured in Forbes).
  - Developed online VAR-based graph learning algorithms for quantifying system dynamics and stability from multivariate time series data (IEEE TSIPN under review).
  - Developed a graph clustering algorithm for group formation adopted by 3 European universities.
  - Industry partnership with Sony for EEG artifact removal algorithms.
  - Reviewer for Neural Networks Journal and IEEE Transactions in Signal Information Processing over Networks.

University of Manchester, Master of Philosophy (MPhil) in Statistics — Oct 2020 – Oct 2021

- Developed causal effect estimators for high-dimensional data analysis, initiating a research direction that has led to new PhDs being funded in the topic. Research published and presented at Royal Statistical Society Conference.

University of Manchester, Master of Physics (MPhys) with First-Class Honours (74%) — Sep 2015 – Jun 2019

- Strong mathematical foundation in differential equations, linear algebra, statistical mechanics, and quantum mechanics. MPhys thesis was published and awarded best poster at European medical physics conference.

Relevant Experience

The Swiss AI Lab, Visiting Researcher, – Lugano, Switzerland — Jan 2025 – Present

- Member of the Graph Machine Learning Group led by Cesare Alippi (IEEE Fellow) working on machine learning and reinforcement learning methods for uncertainty estimation and active learning on time series and graphs.

Stealth, AI Consultant – London, UK — Feb 2024 – Sep 2024

- Led development of ML algorithms for real-time sentiment analysis and user behaviour prediction, resulting in a commercial app with 200+ users and filed U.S. provisional patent.

Hummingbird Venture Capital, AI Resident – London, UK — Dec 2022 – Oct 2023

- Developed a comprehensive investment thesis for AI in healthcare sector, published in series of online articles.
- Conducted technical due diligence to inform and guide new investments in AI.

University of Oxford, Research Assistant – Oxford, UK — Mar 2020 – Sep 2021

- Led strategic data analysis and chaired stakeholder meetings for the design of a new radiotherapy machine optimised for developing nations. Member of a global team involving collaborators at Harvard and CERN.
- Co-authored the Conceptual Design Report for the new machine, published 3 papers and a book chapter.

Admiral Financial Services, Data Analyst – Cardiff, UK Mar 2020 – Sep 2020

- Led statistical and machine learning projects for loan pricing and risk analysis as member of analytics team.
- Designed a recurrent neural network to forecast loan book events and launched the company-wide 'Financial Well-Being' project to predict and manage the high-risk customers.

Mirada Medical, Intern Research Scientist – Oxford, UK Sep 2019 – Dec 2019

- Led three-month research project evaluating robustness of deep-learning image segmentation products.

Other Experience

Imperial College London, Teaching – London, UK Jan 2022 – May 2025

- Teaching Assistant for 'Financial Signal Processing and Machine Learning' MEng course, covering time series analysis, VAR models, portfolio optimisation, and statistical methods for financial applications.

First Tutors, Mathematics, Statistics and Physics Tutor – UK Jun 2017 – Jun 2024

- Successfully tutored 20+ students through GCSE and A-levels, developing a strong ability to communicate and explain difficult concepts in an intuitive manner.

London's Generative AI x Healthcare Hackathon, Organiser – London, UK Jun 2023 – Sep 2023

- Organised hackathon at Imperial College London with 70+ participants, negotiating sponsorship deals from OpenAI, Microsoft and Hummingbird.

London's Geometry and Machine Learning Summer School, Collaborator – London, UK Jun 2022 – Jun 2022

- Worked on a team led by Dr. Cangea, Senior Research Scientist at DeepMind, to embed music theory priors into transformer-based music generation algorithms.

Technical Skills

Programming Languages: Python (advanced), R (advanced), C++ (beginner), Java (beginner), SQL (intermediate).

Machine Learning & AI: PyTorch (advanced), time series analysis (VAR, RNN), graph neural networks, deep learning, reinforcement learning, uncertainty quantification, causal inference.

Mathematical & Statistical: Optimization theory, statistical inference, linear algebra, stochastic processes, signal processing, differential equations.

Selected Publications

2025: Learning to Predict Global Atrial Fibrillation Dynamics from Sparse Measurements, arXiv.

2025: Relational Conformal Prediction for Correlated Time Series, ICML.

2025: Methods of Causal Effect Estimation for High-Dimensional Treatments..., Medical Physics.

2025: Granger Causality Analysis of Persistent Atrial Fibrillation Dynamics..., Heart Rhythm O2.

2024: Online Graph Learning via Time-Vertex Adaptive Filters: From Theory to Cardiac Fibrillation, arXiv.

2023: Improving Diffusion Models for ECG Imputation with an Augmented Template Prior, ICML Workshop.

2023: Fair and Skill-Diverse Student Group Formation via K-Way Graph Partitioning, AAAI Workshop.

2021: Novel Methodology to Assess Effect of Contouring Variation on Treatment Outcome, Medical Physics.

Awards & Achievements

2023: G-Research grant winner to support visit to Graph Machine Learning Group, Switzerland.

2023: PhD research featured in Forbes magazine for innovative cardiac fibrillation mapping technology.

2021: UK Research and Innovation (UKRI) PhD Scholarship recipient (full 3.5 years tuition and stipend).

2021: Invited to Global Health Catalyst Summit at Harvard Medical School.

2020: €1000 Best Poster Prize in Physics and Imaging in Radiation Oncology (ESTRO conference).

2020: Cancer Research UK MPhil Scholarship recipient (1 year tuition and stipend).

2015: Physics and Astronomy Entrance Scholarship for achieving 3A*'s at A-Level (£1000 prize).