Joseph J. Webb

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Education

University of Oxford, Worcester College — *Sep 2024 – Present*
Master of Science in Mathematical Modelling and Scientific Computing

The **Worcester College Mathematical Sciences Scholar** and recipient of a Mathematical Institute bursary for academic excellence. The MSc includes a 20 page technical report on **Mathematical Models of Financial Derivatives**, and both a 20 page technical report and 50 page dissertation on **Deep Learning**.

University of Warwick
Bachelor of Science in Mathematics and Physics — *Sep 2021 – Jun 2024*

Founder and president of *The Poincaré Project* which produced a yearly magazine focussed on the intersection of mathematics, physics, and computer science. — **First Class Honours** ↗

Experience

University of Warwick, Department of Physics — *May 2023 – October 2024*, *Coventry, UK*
URSS Researcher

Received funding for a self-directed machine learning (ML) research project to demonstrate that electron diffraction patterns can be generated from crystal structure data using ML. (supervisor: Prof. Rudolf A. Römer.)

Self-Employed — *Jan 2017 – Aug 2021*, *London, UK*
Electrical Inspector

Contracted electrical inspecting and testing of financial institutions and data centres in Central London.

UK Government, Department of Digital, Culture, Media & Sport — *Jun 2021*, *London, UK*
Information Technology Support Technician

Provided 1st- and 2nd-line support and produced technical documentation.

The Economist — *Feb 2020 – Sep 2020*, *London, UK*
Information Technology Operations Analyst

Created scheduled scripts to automate server tasks, and built software to optimise resolution of issues.

Selfridges & Co. — *Feb 2019 – Oct 2019*, *London, UK*
Computer Services Analyst

Improved our rollout speed by developing a GUI application to perform device management;

Publications, Articles & Poster Sessions

D. Bayo, B. Çivitcioğlu, **Joseph. J. Webb**, A. Honecker, R. A. Römer, Machine learning of phases and structures for model systems in physics. arXiv:2409.03023 [Disordered Systems and Neural Networks] (2024). ↗

Joseph J. Webb, R. Beanland, R. A. Römer, Large-Angle Convergent-Beam Electron Diffraction Patterns via Conditional Generative Adversarial Networks. [Preprint] (2024).

Joseph J. Webb, "How to Win Games with Quantum Strategies". *Poincaré Magazine* **2**, 23-27 (2024). ↗

Joseph J. Webb, "A Walk in the Quantum: Reinventing a World-Changing Algorithm". *Poincaré Magazine* **1**, 29-36 (2022). ↗

"AI's Bridge Between Structure and Pattern". *Institute of Physics Theory of Condensed Matter Group Meeting* (2024).

Skills

Concepts: Machine Learning, Deep Learning, High-Performance Computing, Numerical Analysis, Numerical Linear Algebra, Computational Physics, Optimisation, Data Analytics and Visualisation

Programming Languages: Python, Julia, C, Bash, Fortran, Matlab, PowerShell

Tools and Technologies: PyTorch, TensorFlow, Git, Slurm, MPI, CUDA, NumPy, Numba, SciPy, Scikit-learn, Pandas, Matplotlib, Juypter Notebooks, LaTeX, Arduino, HTML, CSS, SQL

Selected Open-Source Projects

Quantum Walk: Emulator for quantum walks on directed graphs to speed up the classical PageRank algorithm. ↗

Fractal Explorer: An interactive app utilising CUDA processing to zoom into any fractal of choice. ↗

Project Euler Solutions: Solving Project Euler problems with extremely efficient and optimised code. ↗