Joseph Webb

I like pushing the boundaries on what can be simulated,
and then making it fast.

github.com/wephy ↗
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Education

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

Awarded a scholarship for tuition fees as the *Master of Mathematical Sciences* Scholar and the recipient of the MMSC bursary for academic excellence and performance in interview.

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

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

Experience

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

Received funding to carry out a self-directed machine learning research project.

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

Contracted electrical testing of banks and data centres in Central London.

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

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

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

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

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

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

Preprints, Articles & Poster Sessions

J. Webb, R. Beanland, R. A. Römer. 2024. "*Large-Angle Convergent-Beam Electron Diffraction Patterns via Conditional Generative Adversarial Networks*" — *2024*

Poincaré Magazine, Issue 02: "*How to Win Games with Quantum Strategies*" ↗ — *2023*

Poincaré Magazine, Issue 01: "*A Walk in the Quantum: Reinventing a World-Changing Algorithm*" ↗ — *2022*

Institute of Physics: Theory of Condensed Matter – *AI's Bridge Between Structure and Pattern* — *13th June 2024*

Open-Source Projects

- **AI Diffraction:** A machine learning approach to electron diffraction, built on NVIDIA's pix2pixHD.
- **Quantum Walk:** A simulator for quantum walks on directed graphs to emulate and improve the classical PageRank algorithm, and an implementation on lattices to compare classical and quantum information processing.
- **Fractal Explorer:** An interactive explorer utilising CUDA processing to investigate any fractal formula.
- **Project Euler Solutions:** Solving Project Euler problems with extremely efficient and optimised code.

Skills

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

Programming: Python, Julia, Bash, Fortran, C, PowerShell, SQL

Tools and Technologies: Git, Slurm, MPI, CUDA, PyTorch, TensorFlow, NumPy, Numba, SciPy, Pandas, Matplotlib, LaTeX, Arduino