Charles Pilkington

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EDUCATION

University of Oxford, Keble College — Oxford, OX1 3PG | Oct 2026 - Present
BA/MCompSci in Computer Science
Standardised Admission Tests: TMUA: 8.0 | MAT: 77
Relevant Modules: Linear Algebra, Continuous Mathematics, Probability, Functional Programming, Imperative Programming.

CRGS Sixth Form — Clitheroe, BB7 2BA | Sept 2024 - June 2026
Mathematics (A*), Further Mathematics (A*), Computer Science (A*), Physics (A*)

WORK EXPERIENCE

RLC GROUP | IT Support Intern — Accrington, BB5 5AY | July 2025

- Analysed enterprise IT infrastructure and relational database systems in a live aerospace production environment, gaining exposure to server administration, access management, and operational security practices.
- Worked with production-grade virtualised environments, including Ubuntu-based servers in VMs and Windows batch scripting used to automate routine internal tasks.
- Explored edge-computing deployment methods by auditing Raspberry Pi telemetry nodes that gathered machine data, processed it locally, and streamed live metrics to engineering terminals.

PROJECTS

POKER AI ENGINE & MACHINE LEARNING CLIENT (NEA)

C#, Neural Networks, Reinforcement Learning, PPO, HFRL

- Built a poker-playing ML client from scratch in C#, implementing the training loop, evaluation logic, and supporting data pipeline with minimal library use to understand the full reinforcement-learning stack.
- Derived and coded the core optimisation steps and mathematical operations manually, including normalisation and parameter updates, to test how PPO-style learning behaved end to end.
- Built neural networks from scratch and compared sigmoid, tanh, and ReLU activations first-hand, observing how activation choice affected training dynamics and exposing the vanishing-gradient problem in deeper models.

TCP SERVER & CONCURRENT DATABASE (NEA)

Python, SQL, TCP Sockets, Networks, CyberSecurity

- Implemented a multithreaded TCP server from first principles using low-level sockets to manage bidirectional state synchronisation between clients and the game engine.
- Designed a concurrent relational database layer to store and update game state reliably under multiple connections.
- Added encrypted transport and authentication checks to restrict access to authorised clients and protect remote database access.

SKILLS

Languages: Python, C#, Haskell, SQL, Batch
ML / Data: TensorFlow, NumPy
Systems: TCP sockets, multithreading, concurrent programming, encryption, database design
Research / Maths: Linear algebra, multivariable calculus, probability, optimisation, reinforcement learning

AWARDS

- UK Bebras Challenge Gold
- UKMT Senior Maths Challenge Gold (Best in School)
- UKMT Senior Team Maths Challenge Bronze