EOIN MAG UALGHAIRG

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EDUCATION

University of Bath   Sept. 2024 – June 2028
MMath (Hons) Mathematics (1st class average)   *Bath, UK*
Modules *Linear Algebra, Analysis, Probability and Statistics, Vector Calculus and Mechanics*

Ysgol Gyfun Gymraeg Glantaf   Sept. 2022 – June 2024
A*A*A*A Further Mathematics, Mathematics, Physics, Computer Science   *Cardiff, UK*

EXPERIENCE

Summer Operations Administrator   June 2025 – Sept. 2025
Tandem Bank   *Cardiff, UK*
- Proposed and independently developed Form Pilot software in collaboration with senior management, streamlining HM Land Registry charge removal processes and reducing processing time by 75%, saving £1,300 per month.
- Processed HM Land Registry queries from customers and solicitors, replied to requisitions to correct application errors, and expedited urgent cases.
- Managed customer requests by issuing settlement figures and statements, processing account updates, and enabling customer loan portal access.

Mathematics Tutor   Mar. 2025 – Present
Blacks Academy   *Remote*
- Deliver one-to-one maths tutoring to students from Year 6 to Year 12.
- Tailor each session to the student's needs, adapting pace and explanation styles to match individual learning preferences and ensure concepts are fully understood.
- Support students with anxiety and autism spectrum conditions, creating comfortable learning environments that build confidence and academic progress.
- Guide students through key educational transitions including 11+, GCSE, and A-Level preparation with consistently positive feedback from students and parents.

PROJECTS

Machine Learning | *C++*
- Developed a complete neural network implementation in C++ using only the C++20 STL.
- Built a custom matrix class to handle all linear algebra operations required for neural network computations.
- Implemented backpropagation algorithm from scratch to enable the network to learn from training data through gradient descent optimisation.
- Trained on MNIST database and home loan approval data from Kaggle, achieving high classification accuracy.

Form Pilot (Tandem Bank) | *Python*
- Built Python desktop application automating charge removal processes: UN2/CN1/RX4 form generation for HM Land Registry, discharge instructions for Scottish/Northern Irish titles, and evidence forms for application expediting.
- Built comprehensive arrears statements feature for easy statement creation and editing, greatly improving workflow efficiency.
- Ensured all generated documents met required standards for external correspondence with third-party entities and external organisations.

N-body Gravitational Simulation | *C++, Raylib*
- C++ application simulating gravitational interactions between celestial bodies using Newton's law of gravitation.
- Built a physics engine utilising Euler's method to predict the motion of all simulated objects under gravity.
- Created custom user interface with self-implemented buttons, labels, and input fields without external UI frameworks.

TECHNICAL SKILLS

Languages: Python, C++, R, C#, JS/TS, HTML/CSS
Frameworks: React, Node.js, NextJS
Libraries: NumPy, Pandas, Raylib, matplotlib