Thomas Bale

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Experience

Machine Learning Research Assistant, University of Bristol – Bristol   Feb 2025 – Current
- Using NNs to develop a scalable and cost effective workflow for generating photorealistic stimulus sets for psychological research of emotional face stimuli.

Founder -> President, University of Bristol Quantum Computing – Hybrid   Dec 2024 – Current
- First elected president - Prepared and managed the planning of the university's first quantum computing hackathon. Run, manage and oversee: weekly sessions, challenges and member's interests.
- Founder - After gauging interest for a quantum hackathon at the University of Bristol, it was clear that there were many like-minded people eager to break into this area.

Co-owner & Co-Founder, Veloworks Components – Hybrid   Sep 2024 - Current
- Co-own and run a small business, where we create 3D printed, performance cycling products.
- My role involves designing new products and customising existing designs for customers, arranging sponsorships with influencer athletes and cycling/tri clubs, social media marketing, overseeing the printing process and managing accounts.

Machine Learning & Software Engineer, DigitalU3 – Remote   Sep 2024 – Current
- Contract to design a product for the u3core suite for a neural network approach for fire, smoke and oil detection.

Education

University of Bristol, BSc in Computer Science   Sep 2023 – Current
- 83.5% avg (First class) in contributing modules
- **Activities:** MIT quantum hackathon - team lead and coach for 2 teams. CIUK HPC cluster challenge - best result of 2nd . Competitive swimming (Social Secretary), Triathlon.

Colchester Royal Grammar School, A-Levels   Sep 2021 – Jul 2023
- A*A*AA - Computer Science, Maths, Further maths, Physics
- 100% Achieved in comp sci programming NEA | 1st in cohort for computer science
- **Activities:** CSS (President), Greenpower formula car (Team Lead & Electronics Lead & Composites)

Felsted School, GCSEs   Sep 2018 – Jul 2021
- 9,9,9,9,9,9,9,9,9,A*,Distinction including Maths and English | 100% in DT NEA | Arkwright Final Candidate

Personal projects

$5000 winning project - Quantum Cross-Chain Arbitrage   github.com/TumCucTom
- Winners for ETH Oxford's DeFi hackathon ($5000). A quantum-enhanced cross-chain arbitrage bot that uses QAOA and Flare's blockchain protocols to execute fast, secure, profitable cross-chain arbitrage via flash loans.
- Team of 3 - I programmed all backend: QAOA; graph construciton inc liquidity, slippage, gas calculations and flash loan executions with vyper.
- Tools/skills used: Blockchain, DeFi, Flare,Vyper, Qiskit

Infer from underlying patterns in Wordle   TumCucTom/georgia-AI
- A ML AI that infers the NYT wordle using only the results of how other people guessed. Implements optimisation techniques for learning and post-processing.
- Tools/skills used: python, pytorch, numpy, NN optimisation techniques, beam search.

Quantum Finance Predictions   github.com/TumCucTom
- Web app that takes a stock symbol, fetches data and outputs movement predictions - 3h quantum hackathon.
- Tools/skills used: Python, Qiskit, ML, AI, Node and vue.js, LaTeX, Jupyter

Technologies and Skills

Languages and Technologies: GO, C, Java, C#, SQL, Haskell, Python, Qiskit, Torch, Tensor, Node.js, R, AWS

Skills: AGILE Methods, HPC, Quantum programming, Test Driven Development, ML, AI, CAD, databases, first aid