

# Thomas Bale

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## Experience

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- Demonstrator and Graduate Teacher**, University of Bristol Aug 2025 –  
• Supporting 3 x year 2 computer science modules. Acting as a mentor and assisting students in workshops.
- UK HPC Student Team**, UKSCC May 2025 – Jun 2025  
• Represented the UK at ISC SCC. Optimised OpenMX and LLMs (llama) on a 208 core, 8xH100 cluster.  
• Experience with load balancing, networking, OpenMP, MPI and CUDA programming.  
• Worked with SLURM, LAPACK, BLAS, ScaLAPACK, FFTW, ELPA, OpenBLAS, Intel MKL and custom profiling.  
• Explored LoRA, QORA, DoRA, transformer engine and FP8, flash attention 3 for llama 8B.
- Machine Learning Research Assistant**, University of Bristol Feb 2025 – Aug 2025  
• Developed a scalable ML workflow for generating photorealistic, emotional faces for psychological research.
- Co-Founder & Operator**, Veloworks Components Sep 2024 -  
• Co-founded and operate a business producing 3D-printed performance cycling components.  
• Manage operations encompassing sponsorship, marketing, technical stages, and financial activities.
- Machine Learning Software Engineer Intern**, DigitalU3 Sep 2024 – Mar 2025  
• Engineered a machine learning-based system with a strong focus on efficiency and scalability.  
• Collaborated in an AGILE team, contributing in sprints, code reviews, and iterative delivery.  
• Developed a scalable web application with integrated backend and structured database.
- Machine Learning Engineer Intern**, DeepSynthetics Dec 2024 - May 2025  
• Enhanced model performance by 250%+ for predictive modelling in all weather horse racing.

## Education

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- University of Bristol**, BSc in Computer Science Sep 2023 – Current  
• 83.5% avg; ranked top in cohort: CSA  
• Founder & President UoB Quantum Society, 4 x Hackathon Wins, Ironman Switzerland, ISC SCC
- Colchester Royal Grammar School**, A-Levels Sep 2021 – Jul 2023  
• A\*A\*AA - Computer Science (ranked 1st in cohort; 100% NEA), Maths, Further maths, Physics

## Technical Projects

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- Quantum Cross-Chain Arbitrage - \$5000 Win**  
• Built a hybrid quantum-classical arbitrage bot for executing cross chain flash loans.  
• By using QAOA with custom graph construction, liquidity/slippage modelling, and flash loans with Vyper.

## Technologies and Skills

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**Languages:** Python, Go, Java, C, C#, Haskell, HTML/CSS, JavaScript,

**Frameworks/Tools:** SQL, API/REST, Git/Github, React Native, PyTorch, TensorFlow, Qiskit, AWS, Cursor

**Skills:** AGILE & Test-Driven Development, Quantum Programming, Machine Learning (ML), Artificial Intelligence (AI), High performance computing (HPC), CAD, Generative AI, Computer Vision, LLM, A/B Testing, NLP, Prompt Engineering, User Research