ADAM ALDERTON

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Gonville & Caius College, University of Cambridge

Education

PhD (In Progress) – University of Cambridge **2022 – 2025**

- Electrical engineering with collaboration in the applied mathematics department.
- Awarded a full EPSRC studentship (£130k) for four years (MRes + PhD).
- Thesis title: **Communication and Cryptography with Continuous Quantum Variables**.
- Theoretical analyses of quantum cryptography protocols from both a communication systems engineering perspective and quantum information-theoretic perspective.
- Analysis of real communication system data to validate mathematical and statistical models.
- Developing new quantum communication and networking protocols specifically for cryptographic applications informed directly by practical implementation considerations.

MRes Photonic and Electronic Systems – University of Cambridge **2021 – 2022**

- **Distinction**. Specialisations include information theory, quantum technologies, machine learning, embedded systems and entrepreneurship
- Funded in full in association with University College London.
- Conducted research in communications engineering and photonic device physics.

MPhys Physics – University of Exeter **2017 – 2021**

- **First Class (Hons.)**. Specialisations include theoretical physics, quantum optics, and statistical physics.

Other Technical Experience

Supervisor – Engineering Department, University of Cambridge **2022 – 2025**

- Third year courses: Mathematical Methods, Statistical Signal Processing and Photonic Technologies.
- First year course: Computing with Python.

Research Intern – Physics Department, University of Cambridge **2020**

- Developed control software experimental automation applied to physics experiments.
- Received accolades for my work at a national conference.

Software Engineer Intern – Matrixx Software **2019 – 2020**

- Developed a reinforcement learning agent for automated Android app testing.
- Deployed a cloud-based CI/CD pipeline for automated testing at scale on the AWS.
- Accepted a part-time role to continue development alongside my studies.

Publications

A Alderton, M Alhussein, A Weerasinghe, A Wonfor, R Penty. Low-complexity key reconciliation for continuous variable quantum key distribution enabled via quantum process tomography. *Under review.*

A Weerasinghe, M Alhussein, **A Alderton**, A Wonfor, R Penty. Practical, high-speed Gaussian coherent state continuous variable quantum key distribution with real-time parameter monitoring, optimised slicing, and post-processed key distillation. *Nature Scientific Reports* **13**, 21543 (2023).

Technical Skills

Python, C. AWS, Git, GNU toolchain, LaTeX. Analytical methods, scientific computing, machine learning, data analysis and inference.

REFERENCES AVAILABLE ON REQUEST