Alexandre Coates

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1 PERSONAL STATEMENT

I am a PhD Physicist, experienced in creating computational models and performing data analysis. My main interest is learning about new domains and addressing relevant problems, especially uncovering underlying subtleties within datasets. I pride myself on clear communication of my work, having many years of experience giving talks to the public, industry, and fellow researchers. As well as a record of producing scientific papers and appealing data visualisations.

2 EDUCATION

2.1 THEORETICAL PHYSICS PHD

Heriot-Watt University | 2018 - present

Designed, programmed, and analysed computational models of energy transport in disordered quantum systems. I predominantly worked solo on long-term projects, carrying out my own data analysis and checks throughout. Alongside research I spent 3 years as a representative for all Physics PhDs in the university, designing a mentorship scheme as well and planning and hosting talks.

Achievements:

- Conceived, planned and published a scientific paper as first-author
- Wrote all my own Python code to translate mathematical problems into computational ones
- Designed new university mentorship scheme, winning award for best course representative
- Totally overhauled and documented university LaTeX thesis template

Skills:

- Python, numpy and pandas for numerical simulations, data analysis, and visualisation
- Self-directing work on long-term technical projects, alongside other commitments
- Oral skills, have given talks to technical and non-technical audiences of up to 80 people
- Designing my own technical figures, graphs, and posters to make research approachable

2.2 RESEARCH MASTERS IN TRANSLATIONAL QUANTUM TECHNOLOGIES

University of Birmingham/ National Physical Laboratory | 2017-2018

Acted as team leader for 6 other physicists on a 6-month project to design and build a quantum magnetometer. In the latter half I had a 6-month placement at the National Physical Laboratory, conceiving and writing Python code to help manage the operation of a quantum clock.

Achievements:

- Interpreting practical needs and actions from documentation and scientific papers
- Produced a package of Python functions to automate and improve quantum clock operation

Skills:

- Managed my team, helped organise and track progress, kept everyone aware of deadlines
- Presenting research progress to industrial associates and funders

2.3 BSc. Physics with International Study

University of Birmingham / Karl-Ruprechts Universität Heidelberg | 2013-2017

Studied a blend of theoretical and applied physics, carrying out laboratory experiments, mathematical analysis and programming. Also included a year of studying Physics and languages in Germany.

Achievements:

- 1st class with honours
- Achieved advanced German (C1)

Skills:

- Familiarity with C++, MATLAB
- Time management and absorbing technical material
- Comfortable with mathematically involved problems

3 Technical Experience

3.1.1 Hardware co-ordination system for Quantum Clock Placement

National Physical Laboratory | March – September 2018

Placement during my MRes, I worked with a research group that wanted help automating tasks on a quantum clock that was still under construction. Through a mix of scientific literature and discussions I learned about the hardware needs of a quantum clock, and planned out how best to help it operate, iterate, and collect data. I taught myself object-oriented Python and oversaw the conception, testing and implementation of a custom software library to help automate and speed up future lab tasks. The project finished on time and accompanied with plain language documentation for the research team and project funders.

3.1.2 Computational and Systems Biology Intern

John Innes Centre | August - September 2016

Spent 6 weeks learning about vernalisation from current systems biology literature, and then refining MATLAB models of plant responses to the environment. I helped the research group start implementing temperature effects in vernalisation models for *Arabidopsis Thaliana*

4 Skills

4.1 Technical Skills

- 4 years of experience using Python for scientific computing, data analysis and visualisations, with focus on numpy, scipy, pandas, qutip and matplotlib
- Confident carrying out own statistical analysis and fitting of data
- Confident user of Microsoft Office Suite and alternatives (Google Office, LibreOffice)
- Experienced with LaTeX document typesetting for longer reports and scientific papers
- Familiar with MATLAB, have some experience with C++, C#, R, SQL

4.2 Additional Skills

- Able to read and digest dense, technical texts, including outside my specialisms
- 5 years' experience of talks to audiences of up to 100. Consistently praised for clarity
- Speak advanced German (C1 CEFR level)