Neal Carr

Location: Exeter, Devon
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Profile

A software engineer at the Met Office, with a PhD in mathematical physics and a 2.1 degree in Mathematics from the University of Cambridge. Interested in applying strong mathematical problem-solving skills to practical, real-world problems. At the Met Office, I am currently developing programming experience to facilitate a career in software development.

Education and qualifications

University of Kent- 2014-2018: PhD in Mathematics: "The ODE/IM correspondence for simply-laced Lie algebras"

- My thesis was concerned with generalising the "ODE/IM correspondence" - a connection between differential equations that generalise the Schrödinger equation, and mathematical descriptions of systems of many particles in two dimensions (an example of such system would be a model of ferromagnetism as seen in everyday magnets.)
- Used Mathematica to facilitate laborious calculations and test new mathematical ideas. Also used Python to write more portable code and solve systems of complex non-linear equations. Developed project management and research skills. Gave talks about my research to other PhD students and the local research group (South East Mathematical Physics Seminar)

King's College London- 2013-2014: MSc in Theoretical Physics – Distinction

- Continued to pursue my interest in Theoretical Physics. Completed a short dissertation in the summer of 2014, summarising the results of a research paper and demonstrating understanding of its main results. Dissertation received award for best project of the year.

University of Cambridge- 2009-2012: BA in Mathematics – 2.i

- Attended a wide variety of courses with a particular focus on Applied Mathematics and Theoretical Physics. Developed problem-solving,
- Completed coursework using MATLAB.

De Lisle College- 2002-2009:

- A-Levels: A in Maths, Further Maths, Physics and Chemistry. 11 GCSEs A*-A, including Maths and English.

Work experience

September 2019 – present: **Met Office**

Foundation Scientific Software Engineer

- I assist with maintenance and updating of the UKCA (United Kingdom Chemistry and Aerosols) component of the Unified Model. I work closely with scientist colleagues to assist them to implement new functionality, bugfixes, and improvements to the model.

- Also working to prepare UKCA for its incorporation into LFRic, the Met Office's new climate/weather model designed for modern supercomputers.

November 2018 – January 2019: **Advanced Geochemical Systems**

Mathematical Modeller

- Worked on a short project modelling temperature distribution of region of Earth's crust to aid in location of potential hydrocarbon deposits.
- Constructed mathematical model using Python. Output data sets were presented to client in clear format, and model was fine-tuned using feedback from client.

September 2014 – September 2018 **University of Kent**

Tutorial Leader

- Led several tutorials for undergraduates. Responsible for guiding the students through their assigned problem sets. Consistently received good feedback for my teaching through the university's anonymous feedback system.

September 2012 – September 2013: **Blue Tutors**

Tier 1 Tutor

- Gained additional one-to-one teaching experience working as a part-time tutor.

Additional experience

- Took part in a week-long modelling camp at the University of Edinburgh, collaborating with a team of other PhD students on a practical engineering problem.
- Ran the Assassins' Guild May Week game at Cambridge. Updated the website displaying the status of the game (using basic HTML) and mediated disputes between players.
- Assisted in the running of a "Code Club" at a local primary school, helping children to learn how to code- first with Scratch, a simplified visual programming language, and then with Python.
- Some hobbyist experience with C/C++.

Key skills

Python, FORTRAN, Mathematica, C/C++, research, communication (giving talks, teaching), Full UK driving licence