Dr Alan Roberts

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Personal statement

Experienced and highly numerate lead data scientist with a strong track-record of developing data-driven solutions to elicit deep insight and create high impact value for clients and colleagues. Strong team builder and player who thrives in collaborative and multi-disciplinary contexts. Confident at communicating with colleagues and stakeholders, both technical and non-technical, from 1-to-1 conversations to presenting at large conferences.

Commercial experience

GeoSpock Ltd, 2018 – present

Lead Data Scientist (Oct 21 – present) managing team of three other data scientists
Senior Data Scientist (Mar 19 – Sep 21)
Machine Learning Engineer (Jan 18 – Feb 19)

Analytics

- Predicted air quality, traffic & other datasets for smart cities, congestion charging & insurance risk.
- Researched and implemented a shipping emissions model for maritime industry regulator PoV to enable fast quantification of global, regional, and port-scale emissions.
- Analysed traffic mode switching and re-routing due to bridge closure.
- Optimised distribution of health-care sites, reducing response time and fuel use, saving client £50k/year.

Technical

- Co-synthesised >100Tb/trillion row traffic and ad-tech datasets successfully securing >£500k investment.
- Prototyped agent-based simulation workflow to use together with company platform.
- Implemented Java routing code in Spark for use in major projects.
- Built comprehensive library for spherical data transformation and interpolation.
- Constructed workflows to connect company database to BI tools and programmatic interfaces.
- Collaborated with engineering team to develop features and significantly improve database efficiency.
- Created optimised complex SQL queries and UDFs (e.g. geohash encoding, route manipulation).

Business and management

- Senior Management team member contributing to strategic decisions and advocating for the team.
- Organised team's work, e.g. coordinated team implementation of containerised DL model deployment.
- Mentored junior and experienced data scientists and coordinated training.
- Frequently engaged with clients & investors, showcasing work, building use cases & giving technical input.
- Developed and reviewed PoC proposals and statements of work for significant clients.
- Wrote and contributed to blog articles and company marketing material.

Pivigo (Science to Data Science), 2017

Data Science Fellow

Co-created data analysis and predictive models to optimise marketing strategy for a FTSE 100 company.
Benefitted from intensive commercial, teamwork, business and strategy training by world class MBA lecturers.

Geospatial Research Ltd., 2014 – 2016

Research Geoscientist

Designed & built an interpolation tool for geological models in time, significantly increasing client efficiency.

- Technical lead, coordinating the work of three colleagues.

Company advisor for mathematics and computing, and built tools for data processing, including:

- statistical analysis code for presentation of data and results enabling standardisation of client reports
- a Python tool for LiDAR image processing.

Research into fracture imaging, expanding company expertise and portfolio.

Academic experience

Dept. of Earth Sciences, Durham University, 2008 – 2014

Research Associate

Designed and built a neural-network-based Bayesian system to enable the rapid Full Monte Carlo screening of vast geophysical model spaces for plausibility.

- Worked with professional statisticians to deliver on time for industry sponsors.
- Developed a deep understanding of Bayesian methods.

Carried out two-year study for a major gas supplier simulating CO_2 injection into gas reservoirs, providing important technical insight for global climate change mitigation.

Coordinated the writing of a pioneering €13m cross-disciplinary ERC proposal for the investigation of uncertainty associated with very large datasets and model spaces.

Taught undergraduate practical classes & small group tutorials and lectured in advanced mathematics.

Published numerous journal papers and presented widely at major international conferences.

Edited and compiled departmental research bulletin.

PhD (Geophysics) & Research Associate, Dept. of Earth Sciences, Uni. of Cambridge, 2002 – 2008

Crustal Structure of the Faroes North Atlantic Margin from Wide-Angle Seismic Data

Built a robust seismic model giving new understanding for the formation of the Atlantic, published in Nature (2008), which continues to be regularly cited by Earth Scientists.

Developed team working skills in a high-stress environment while collecting data on a research ship for two months. Responsible for maintenance of onboard UNIX network and software.

Taught undergraduate practical classes & small group tutorials and assisted in training PhD students.

Gave accessible talks for secondary school pupils about geophysics and life as a scientist.

MA, MSci Natural Sciences (Experimental and Theoretical Physics), Uni. of Cambridge, 1997 – 2001

Dissertation: Lithosphere structure from Love waves.

Computer project: Simulation of polymer chain growth.

Lit. Review: Evolution of physics examining 1940–2000 at Cambridge (published in *EJP*, 2001).

Selected technology, programming languages and other experience

Methods: Data synthesis, query optimisation, agent-based simulation.
Code and project management: AWS, Jupyter, GitHub, BitBucket, Jira.
AWS services: EC2, S3, EMR, EKS, SageMaker, CostExplorer, Workspaces.
Coding languages: Python, Scala, Spark, SQL, Java, R, Perl, Fortran, shell scripting, Matlab.
DL frameworks and libraries: PyTorch, Tensorflow, sk-learn, pandas, shapely, geopandas.
BI tools: Tableau, PowerBI, QuickSight, Superset.
Geospatial/geophysical software: ArcGIS, Seismic Unix, GMT, Omega, GEM/IMEX/STARS.

Tutoring

University of Cambridge [Dept. of Physics]: Tutorials for undergraduate physicists in advanced mathematics.
Long Road 6th Form College, Cambridge: Individual tutoring for GCSE Mathematics.
Freelance: Individual tutoring for A-level Mathematics and Further Mathematics.

Languages

English – Native speaker
French – Conversational and GCSE (Grade A)
Chinese (Mandarin) – OCR Asset Languages Beginner L3
Japanese – Basic speaking (evening classes)
Korean – Can read and write script (basic)

Other interests and hobbies

Active member of local church. Past president of local Christians in Science group, leading a committee of four organising events and speakers. Part of a team organising an international friendship café.

Keen cricketer and walker including treks to Everest Base Camp, Mount Fuji and the Alps. Avid long-distance train traveller in Europe, Asia & North America. Enjoy language learning & actively interested in other cultures.

Eager cinemagoer, reader of history, philosophy and theology, piano player & enjoy socialising with friends.