HARRY COOKE PhD

Software engineer | Data scientist | Particle physicist

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Experience

Acturis — *Technical Business Analyst*
MAY 2024 - PRESENT
Working with clients to build and maintain insurance products

University of Birmingham — *Postgraduate Teaching Assistant*
OCTOBER 2019 - MARCH 2023
Teaching in undergraduate computing and physics labs during PhD

Education

University of Birmingham
2019 - 2023 — *PhD Particle Physics*
Searching for rare Standard Model interactions with the ATLAS collaboration
Statistical analysis, machine learning, programming in C++ and Python

University of Birmingham
2015 - 2019 — *MSci Physics with Particle Physics and Cosmology*
Class I, Cum Laude
Graduated first in year for experimental physics
Awarded Bloodworth Prize (Y3) and Moreton Prize (Y4) for academic excellence
and Tessella Prize for most innovative use of software in a Y4 project

Hereford Sixth Form College
2013 - 2015 — *A-Levels: A*s in physics, maths, further maths, computing*

Technical Skills

Software development
10 years of experience and competent in multiple programming languages:
C++ — Daily use throughout PhD for data analysis and algorithm design, working with large software frameworks. 8 years of experience.
Python — Developed internal tools to automate common processes at Acturis. Used for scripting and data visualisation in PhD and for larger personal projects. Taught to Y3 undergraduate students. 7 years of experience.
JavaScript (HTML, CSS) — Built monitoring and visualisation tools for use with detector hardware. Some small personal web projects. 6 years of experience.
SQL — Used extensively in role at Acturis to maintain databases for client information and product configuration. 6 months of experience.
Some experience with many more languages, including
Bash, Ruby, Java, Go, Rust, Kotlin, Matlab, Maple, Julia, XSLT, XPath

Data analysis
Experienced with a number of analysis techniques:
Analysis performed during the PhD required use and understanding of *machine learning techniques, likelihood model building, maximum likelihood estimation, treatment of systematic and statistical uncertainties, hypothesis testing,* and more. Received formal training in statistical methods during undergraduate degree and in a postgraduate course.

Quality assurance
Always ensure the highest build quality through extensive testing:
For each change built at Acturis, write detailed test packs ensuring new and existing functionality works as expected. Either conduct testing personally or coordinate with internal teams to ensure 100% pass rate on all tests. Built and shared tools to automate common testing processes.

Miscellaneous
Experienced with version-control software, see a selection of projects on my GitHub page. Adept in operation of unix-based systems and Windows, for both work and personal use. Proficient in writing and typesetting of documents, particularly with LaTeX – created the official University of Birmingham overleaf templates.

Transferable Skills

Project management
Independently planned and performed a 2.5-year-long physics analysis. Involved long-term planning and prioritisation of tasks to ensure that the analysis was completed within the timeline of the PhD.

Client Relations
Worked directly with multiple clients in role at Acturis to ensure builds are delivered to requirements and defects are investigated and resolved promptly. Product owner for one client, acting as first point of contact for issues or requests.

Teamwork and communication
Collaborated on many projects with colleagues within the University and internationally. Worked on an analysis with a team of ~10 physicists to attain a world-leading result. In the L1Calo operations team, took week-long 24/7 on-call shifts to ensure continuous running of the ATLAS experiment. Communicate frequently with internal teams at Acturis to delegate tasks and ensure that projects are delivered on time and to high quality.

Time management
Worked on multiple concurrent projects during the PhD and learned to effectively split time between tasks, whilst also scheduling individual work time around meetings and other commitments. Have applied this experience to manage many simultaneous projects at Acturis.

Leadership
As an undergraduate, led 14 students for a 3-month project, producing a 90-page document on design of high-energy particle detectors. Responsibilities included dividing and delegating tasks amongst small teams, setting deadlines, and organising and chairing regular meetings.

Problem solving
Demonstrated through research in deriving solutions to mathematical problems, implementing code to analyse very large datasets or simulate systems, and optimising an analysis to best extract a result from data.

Personal Interests

Enjoy playing tennis and 5-a-side football. Founder and first president of the University of Birmingham Benchball Society. Enjoy working with computers, having built a custom PC for work, gaming, and more.

References available on request.