

JOSHUA COLES

Full-stack Developer

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WHO AM I?

Working in the domain for over 10 years software engineering is a profession and a passion. My drive throughout has been to understand the business and organisational context of the problem, as the most important component of any technical solution. In my work at the ONS, I was responsible for software delivery, helping to manage a large team of contributors under a tight timeframe. I have developed a love and appreciation for correct solutions that respect their user and customers and am excited to see how AI can enhance this mission in otherwise intractable domains.

Typescript ██████████
React ██████████
Rust ██████████
Python ██████████
Git ██████████
Scala ██████████

EXPERIENCE

Present	Software Developer After completing my degree I have returned to the non-profit to continue the work on the real-time flight plan solution for coaching.	Better Conversations Foundation
Academic Year 2023/24	Final Year Project, AI Applications in Lagrangian Physics My dissertation focused on incorporating Lagrangian Mechanics into physics-informed neural networks. My key contributions include, • Creating and optimising the core physics procedures in JAX to improve correctness compared to legacy implementations, and to allow for their use in loss functions, reducing run-times by a factor of 10^4. • Researching, designing, and validating training methods. The completed report can be found here . JAX / Neural Networks / Machine Learning / AI / Numpy / Flax / Tensorflow / Keras / Python	University of Bath
Summer 2023	Software Developer Once I completed my work with Amphora, I moved to work at a connected non-profit, Better Conversations Foundation, working on their e-commerce and scheduling systems and initiating development on a real-time coaching flight-plan solution. • Implementing key components of purchase flows, scheduling, and participant management. • Prototyping real-time coaching flight-plans to allow coordination between Facilitators as sessions progress Ruby on Rails / Stripe	Better Conversations Foundation
Summer 2023	Software Developer I lead efforts exploring the feasibility and application of AI based features in the main product. • Integrating vector based search and retrieval-augmented generation into the application in a non-intrusive manner. • Presenting work to customers and facilitating input on direction and feature fit. Langchain / Weaviate / Python	Amphora

2022 – 2023
part time aside studies

2021 – 2022
placement year

Software Developer

Office for National Statistics

I joined a team working designing and developing software for processing the results of the 2021 Census. After the end of my placement I was kept on to assist with the next phase of product development and solution design. In this role I worked with sensitive data from the Census in isolated production environments and thus obtained SC clearance. Key contributions include,

- Taking a leading role as release manager for the product and was heavily involved in requirements gathering for the new features.
- Developing tools for debugging and observability in sensitive production environments, greatly increasing our ability to diagnose production issues quickly.
- Designing architectures for the next stage of the project to address additional business needs.

This role gave me an appreciation for how the interpersonal aspects of successful team are crucial for the overall success of a project. This was especially important when interfacing with the wider organisation on the direction of the project.

React / Redux / Express / Jest / Cypress / Redis / SQL / Postgres / HBase /
Cloudera / Jenkins / Docker / Typescript / JavaScript / Linux / Microservices /
Agile / Scrum

2017 – 2021
Holidays & Part time

Software Developer

Amphora

I worked independently to explore and investigate new technologies including and

- Creating and maintaining SAML based customer access mechanism for confidential documentation.
- Designing subscription management product using Wordpress as a Headless CMS for presentation under multiple service offering.

SAML / Groovy / Java / Ruby on Rails / Ruby

2011 – present

Ongoing Personal Projects

My latest personal projects are focused on data analysis on different aspects of my life. This is done with a strong focus on self-hosting and privacy. Recent work includes:

- AI based techniques for recipe extraction.
- Database and platform for cross-domain analytics in my life.
- ETL pipelines focused on breaking down data-silos.

A history of these is available on my [GitHub](#) or [personal Gitea](#), along with this CV and build process.

Rust / Python / ETL / CI/CD / Github actions / Postgres / Caddy / Docker /
Docker Compose / System administration

EDUCATION

2019 – 2024

MSc Mathematics and Physics (Hons) (Sandwich)

University of Bath

1st Class Honours. Placement with the ONS between academic years 2 and 3.

Graduated 2019

Prior Qualifications

Reading Blue Coat School

4 A Levels: A* Maths, A Further Maths, A Physics, A Chemistry

GCSEs: 1 A* with distinction, 8 A's, 2 A's, 1 B. Including A* with distinction in Further Maths, A's in Maths, Sciences, English and Computing.

ADDITIONAL QUALIFICATIONS AND TRAINING

Better Conversations — 2022
ISO9001 and ISO27001 training — 2018

INTERESTS

Long distance running; politics and governance and the applications of technology therein; committee member of Philosophy Society at University.

REFERENCES

Available upon request