

# Ainsley Rutterford

London, NW10

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Software Development Engineer with 4 years experience building scalable fullstack solutions using AWS, React and React Native. Proficient in TypeScript, JavaScript, and Python. Experience with Java, C, and C++.

## Work Experience

### Amazon

London

SOFTWARE DEVELOPMENT ENGINEER II

Apr. 2022 – Present

- Backend service development in Python, Java, and TypeScript.
- Web development in TypeScript using React.
- Infrastructure as code using AWS CDK in TypeScript.
- Designed, implemented, and maintained service infrastructure using AWS Lambda, CloudFront, DynamoDB, OpenSearch, SQS, CloudWatch, S3, Bedrock, Step Functions, Batch, ECS, RDS, etc.
- Designed and implemented a trigger and pipeline processing 10M+ events per day to power Prime Video push notifications to 50M+ customers per month.
- Led a team of four engineers on the frontend development of an internal Amazon Studios web application.
- Developed, deployed, and maintained Dockerized Python services running on GPU compute environments in AWS ECS.
- Developed and maintained a backend Python service interacting with LLMs via Bedrock for an internal generative AI tool.
- Led a team and was part of another team that won two internal Prime Video and Studios hackathons with 50+ participants.
- Monthly on-call duty, fixing systems in real time to maintain high availability.

### BX

London

SOFTWARE ENGINEER

Jan. 2021 – Mar. 2022

- Web development in TypeScript using the Next.js React framework.
- Native mobile app development in TypeScript using React Native.
- Developing a serverless backend using AWS Lambda, API Gateway, DynamoDB, etc.
- Deploying resources within AWS using the Pulumi infrastructure as code SDK.
- Creating and editing assets on the Algorand blockchain using the Algorand SDK.

### University of Bristol

Bristol

COMPUTER ARCHITECTURE INTERN

Jul. 2020 – Oct. 2020

- Extended the University of Bristol's ARM processor simulator (*SimEng*) to include a model of the memory hierarchy using the C++ SST library.

## Education

### University of Bristol

Bristol

MEng COMPUTER SCIENCE (FIRST CLASS 77%)

Sep. 2016 – Jun. 2020

- Thesis: Coral Density Analysis using Deep Learning 78%
- Advanced High Performance Computing 82% (top of class)
- Applied Cryptography 98% (top of class)
- Computational Neuroscience 92%
- Theory of Computation 78%

### AWARDS

- Awarded the Cray prize for achieving the highest grade of 50+ students in the Advanced High Performance Computing unit.
- Awarded the Bloomberg prize for achieving a top five grade out of 200+ students in the third year of the Computer Science course.

## Projects

- **[short.as](https://short.as)**: designed and implemented a free URL shortening service capable of 40 million URL shortens per day. Implemented a serverless backend using API Gateway, Lambda, and DynamoDB. The Lambdas are running TypeScript using AWS LLRT for P50 runtimes of 23 ms, and P99 of 96 ms for the URL shorten operation. Load tested up to 450 TPS with 0 errors after 100,000 URL shorten operations. The site is hosted on S3 with a CloudFront distribution using edge functions to allow a single domain to be used for both the backend API and the website. Monthly cost for 4 million daily URL shortens and 40 million daily long URL fetches would be just \$10. Frontend written in Next.js and React with TypeScript. Source code available on [GitHub](https://github.com/ainsleyrutterford/short.as).
- **[cpbitmap.github.io](https://cpbitmap.github.io)**: implemented a free browser based tool that converts Apple's proprietary CPBitmap image format to PNG, JPEG, or TIFF. Uses Next.js to generate static files that are automatically deployed to GitHub pages via GitHub Actions. Frontend written in React using TypeScript. Source code available on [GitHub](https://github.com/ainsleyrutterford/cpbitmap).
- **Deep Learning Thesis Project**: implemented and ablated the U-Net CNN architecture using Keras. It successfully extracts the density banding information present in coral skeleton CT scans, enabling researchers to more accurately calculate coral growth rates. The results were published in the SN Applied Sciences Journal ([DOI](https://doi.org/10.1007/s43657-023-00000-0)). Source code available on [GitHub](https://github.com/ainsleyrutterford/DeepLearningThesisProject).