Andrew **Baxter**

Software Engineer

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Skills

Languages	C#, Clojure, ClojureScript, Rust, Java, JavaScript, TypeScript, Groovy, Go, C/C++, Mathematica
Data Management	Web Services, PostgreSQL, PostGIS, SQL Server, Kafka, Kafka Streams, KSQLDB
Frameworks/Tools	.Net/MVC, Integrant, Reitit, Jackdaw, Reagent, re-frame, Babashka
Deployment/CI	AWS, Docker, Kubernetes, ArgoCD, GitHub Actions, Terraform
Browser Technologies	HTML5, SASS, CSS3, SVG

Recent Experience

Doccla Ltd.

Shepherd's Bush Rd, London, W6 7NL

Software Engineer — *Nov 2023 - Nov 2024*

My most recent role involved integration of a subset of the many messaging systems used by various health authorities throughout the UK and Europe, in support of the company's aim of enabling "virtual wards" (patients remotely monitored by clinicians via Bluetooth-connected mobile apps). Principal technologies were Clojure, ClojureScript, .Net 8, PostgreSQL, Docker, Kubernetes.

Third Bridge Ltd.

12 Steward Street, London, E1 6FQ

Senior Clojure Developer — *Nov 2022 - May 2023*

This role was focused upon implementing a system to reconcile three disparate mechanisms for cataloguing information about industry trends, with the aim of providing investors with a timely, consistent view of industry information and the range of specialists with whom consultations might be brokered (suitably filtered to exclude cases where conflicts of interest might occur).

StatsBomb Inc.

Broad Quay, Bath BA1 1UD

Senior Clojure Developer — *May 2021 - Nov 2022*

My role involved system design, coding, maintenance and out-of-hours support for StatsBomb's core soccer data enrichment capability. This consumed match events collected by a team of analysts in Cairo, and augmented the raw data with inferred match information and statistics. The processing was handled by two separate applications - an "offline" batch processor providing detailed analytics, and a "live" streaming processor. A major part of my work was aimed at bringing the streaming application to feature parity with its offline counterpart, with a view to replacing it.

The code base was almost exclusively Clojure, the processing pipelines being facilitated by Kafka and Kafka Streams feeding into Postgres for API and reporting requirements. Consumers of the API included numerous Premier League teams, along with internal teams.

Deployment of these products was moving toward a GitOps approach supported by ArgoCD and Kubernetes as the preferred option.

Other tasks that I undertook included:

- Created a Clojure-friendly wrapper for the Java Topology Suite, offering clear and intuitive manipulation of geometric match information, with persistence via PostGIS.
- Created a management API for the company's entitlements service, thereby enabling customer success staff to maintain permissions for client accounts.
- Automated numerous time-consuming day-to-day tasks (often via command-line Babashka tools).

Zebraware Ltd.

Chadwick House, Warrington WA3 6AE

Technical Architect — *Nov 2020 - May 2021*

I designed and implemented functionality for a CAD application which provided 3D modelling capabilities for railway overhead line electrification projects. I also provided a technical steer, advising on build and test automation and ways in which the stability and extensibility of the product could be enhanced. The code was principally C# and XAML, and I also introduced Mathematica for calculations pertaining to catenary wire systems.

Medical Management Systems

6 Broad St Pl, London EC2M 7JH

Senior Developer — *May 2019 - 25 Feb 2020*

I contributed to the refactoring of a large, mature, monolithic .Net web application, helping to identify candidate functionality that could most readily be split off into separate services. The code was principally in C#, later additions to the codebase employing functional extensions to the language via LanguageExt.

In addition to coding, I had input into the company's transition to an agile workflow and preparations for increased automation of the build and deployment processes via continuous integration.

CloudM

Lowry House, Manchester M2 3AW

Java Developer — *Sep. 2018 - May 2019*

The company's focus is the transitioning of clients to Google Cloud Platform, and my work was principally focused upon the automation of end-to-end testing via Selenium. This built upon a foundation of ideas explored in my previous employment, extended to cope with the requirements of a single page application with no existing instrumentation. In particular, this involved coding state machines to deal with the parts of the user experience which were not under the company's control (for example Google account logins), and isolating these as reusable workflow elements. Other work entailed coding of internal web services in Go.

J Sainsbury plc

Arndale House, Manchester M4 3AL

Software Engineer — *Jan. 2017 - Aug. 2018*

My work for Sainsburys involved a broad range of technologies used in making their services available at scale, particularly in the sphere of DevOps tooling. Initially, I was engaged in contributing to their business-wide identity system, before becoming part of a new team whose focus was on GDPR compliance.

I contributed code throughout the application stack - front end work in React.js/Redux with Jest tests, backed by microservices (Java / Spring Boot) and deployed to AWS infrastructure (EC2, S3 & Lambda) using Terraform. I re-wrote Sainsburys' existing Selenium end-to-end testing framework by creating a domain-specific language, which better expressed the intent of tests using a far smaller amount of code (typically ≈ 40% of the previous line count) in a manner consistent with their preferred BDD test runner.

I founded and coordinated the Sainsbury's Functional Programming Guild, which involved running regular video conferences across 3 sites. My aim was to foster knowledge of FP techniques, and to promote adoption where it could simplify existing approaches and offer greater robustness.

During one of the company's hackfests, I ported the bulk of Sainsburys' Luna React component framework to ClojureScript (using Reagent/re-frame).

Lancaster University

Lancaster, Lancs. LA1 4WA

Software Developer, Web Services Team — *Apr. 2014 - Dec. 2016*

I was responsible for a major refactoring and ongoing maintenance of the university's Student Portal, a .Net MVC-based aggregator of many disparate services which acted as the main point of access for students' course-related information. In particular, I made the following changes:

- Introduced depencency injection to promote loose coupling of the architecture and improved testability
- Improved responsiveness by making the portal's web services asynchronous and abstracting caching into a separate NuGet library (with policy applied via custom attributes on service methods)
- Replaced the problematic statically generated Timetable view with a dynamic, interactive SVG version better able to cope with future demands
- Improved monitoring (via custom dashboards) and robustness of the system, and enabled throttling of traffic to downstream services which experienced heavy load at certain times of year (e.g. the release of exam results)
- Overhauled the user interface to offer an improved dynamic view of module information from the University's Moodle instances
- Introduced continuous integration, along with automated unit tests throughout the stack
- Created customized portal instances for students of partner institutions in Ghana and Beijing

Whilst at Lancaster, I undertook a Secure Coding course focusing on the mitigation of common security loopholes (in particular the OWASP top 10) and the use of automated penetration testing software (ZAP).

I was also involved in R&D work which included prototyping for the university's events calendar in ClojureScript components using om.next.

Accessplanit Ltd.

Lancaster, Lancs. LA1 1RQ

Senior Developer / Team Lead — *Oct. 2012 - Apr. 2014*

Responsibilities included mentoring of other developers and conducting regular 1:1 sessions in order to identify training needs.

Alongside development for the company's e-learning management product, I introduced distributed version control and continuous integration to the build process. I also used Clojure scripts to perform migrations of client data (usually held in CSV files) to the internal SQLServer schema.

In Touch Ltd.

Morecambe, Lancs. LA4 4ET

Software Engineer — *May 2010 - Oct. 2012*

As the first developer hired to the team, I was instrumental in delivering the initial release of the flagship Works Order Management software within a tight deadline. I was also active in onboarding new developers.

I was involved in all phases of design, delivery and maintenance of a growing suite of products, which were principally aimed at the road maintenance sector and made heavy use of geospatial processing. I also undertook mentoring of student interns, as the company enjoyed a close relationship with Lancaster University's Computer Science department.

Prior to the availability of the .Net Web API, I implemented a REST framework (as a NuGet library) which formed the basis of web services within the company. I was also responsible for the introduction and configuration of distributed version control, continuous integration and dependency injection to the workflow.

As an R&D exercise during the company's 10% time allocated for the purpose, I created a prototypical dashboard application using Clojure / ClojureScript with CouchDB persistence and Server-Sent Events for live updates.

Ancient History

Further back in time, I worked in the following capacities:

- 5 years at the University of Manchester, where I was technical coordinator for the Jorum project (a curated repository of digital learning materials aimed at the further and higher education sectors).
- 2 years at J Sainsbury plc, where I ported a critical component of their supplier ordering system from C to Java. Other principal languages were C and Bash script.
- 5 years at the BBC Open University Production Centre where, in association with OU academic course teams, I created mathematically specified animations for broadcast and distribution with course materials using Mathematica and C++.

Education

University of Hull *Cottingham Road, Hull, UK. HU6 7RX*

BSc Pure Mathematics *1987 - 1990*

Principal topics: Real & Complex Analysis, Linear Algebra, Topology, Logic, Abstract Algebra

Blackburn College *Feilden St., Blackburn, UK. BB2 1LH*

4 'A' Levels *1985 - 1987*

Pure & Applied Mathematics (A), General Studies (A), Physics (B), Further Pure & Applied Mathematics (D).

University of Warwick *Coventry CV4 7AL*

MSc Mathematics (not completed owing to bereavement) *1998*

Principal topics were Algebraic Topology and Differential Geometry

Personal Projects

sorrow *https://github.com/rhinocratic/sorrow*

A Clojure implementation of an error-correcting coding scheme as described by A.S. Sethi, V. Rajaraman and P.S. Kenjale in their 1977 paper. Enables the detection and correction of single transcription errors or single transpositions of adjacent characters, which typically account for 94% of typing errors in the manual entry of identifiers. A nice practical application of ring theory and modular arithmetic.

fud *https://github.com/rhinocratic/fud*

Very much a work in progress! A small, nascent, database-driven Clojure web application which aims to keep track of my post-Brexit stash of food. When it goes live, the world will be able to gasp in horror at the paucity of my diet and deride the excessive age of my beans.

twfy *https://github.com/rhinocratic/twfy*

A fairly ancient set of Clojure web service bindings for the They Work For You API. This permits retrieval of information pertaining to UK parliamentary proceedings from the official Hansard record, along with supplementary information about MPs, MLAs, MSPs and constituencies.

Blog *https://blog.nerdwick.net*

My technical blog was undertaken partly in order to experiment with the JAMStack and to assess its capabilities in delivering dynamic content via a statically compiled site. However, it's also an outlet for my more discursive ramblings and may provide a better indication of my writing style than the necessarily compressed treatment herein.

Kubernetes Cluster

As an exercise to deepen my knowledge of Kubernetes and serverless architectures, I created a cluster from 6 Raspberry Pi boards, a network switch and a USB hub. I deployed OpenFaaS to the cluster in order to experiment with Dockerized functions as a service.