Callum Dempsey **Leach**

MSc · Computer Science

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Summary

I hold a Masters degree in Computer Science from Newcastle University with a distinction where I was awarded as leader for the best team project across the entire School of Computing from Accenture. A contributor to the Elixir programming language, I consider myself to be a flexible and capable full-stack engineer. I am passionate about quality-driven software development and architectures, the user and developer's experiences, and working with others in team-work or leadership capacities. With highlighted industry experience in problem support and resolution for partners of EMIS Health (clinical systems), and agile software development with RHEA Group (defence and space systems), I am seeking greater challenges in software consultancy or development, and study data-engineering techniques (using JVM based languages) at leisure.

Core Skills and Experience

Technical Experience
Programming Languages and Tools: Java, Elixir, Python, Docker, JavaScript, SQL, Apache NiFi, Apache Kafka. Web Technologies: Spring, Django, Phoenix, CSS/HTML, PHP, NGINX. Server technologies: Linux system administration (Ubuntu and CentOS), AWS (EC2, S3, EKS, SNS, SQS), Git

Project Management Experience
Solution Design: Research and development of performance-driven algorithms (i.e. benchmarking current and investigating existing solutions), Test-driven development, Decomposing monolithic systems to microservices, API design and development (GraphQL and RESTful), UX accessibility and usability considerations, UML, OOP Best Practices, Django Best Practices, MVC, Functional programming, Relational databases (E-R Diagrams and Normalization), Architecting solutions to components with team-collaboration in mind. Resource Management: Team-leadership and problem management, Requirements elicitation, Orchestrating team-wide research and development.

Research Experience
Qualitative and quantitative studies and measurements, Critical thinking (claim analysis), Technical writing, Formal logic (propositional, predicate, and modal), Linear algebra.

Work Experience

RHEA Group
Harwell Oxford, England

Junior Software Developer
February. 2018 - Present

- Working in a small but focused team for an £127m ESA funded project (DFMS) I was responsible for maintaining a RESTful API written in Go facilitating the flow of data through an NiFi, NoSQL database, Go, and Django solution stack. I assisted in solution planning, providing research and development ranging relational, NoSQL, and graph databases, and Kafka based prototypes, having developed UML and networking diagrams of proposed solutions. I was responsible for middleware development including API's (REST and GraphQL), distributed system, and authentication services in Elixir. I further provided vulnerability assessments combining research (i.e. OWASP), netcat, and BURP Suite.
- I successfully led and took ownership for the time-bound delivery of Django and Flask microservice components and their docker-compose and Kubernates deployment, providing Python mentorship using pair programming techniques within that process. I developed Python tools to ingest messages from Amazon SQS, and upload objects to Amazon S3, and implemented ETL pipelines for geospatial data processing which involved refactoring the legacy Java codebase of NiFi processors to suit Java best practices.

EMIS Health
Leeds, England

Support Consultant
December. 2015 - September. 2016

- Attained a first-class insight to technology development and deployment of clinical software systems which grounded my critical thinking, technical writing, and social and communication skills (i.e. consultation and presentation) in an applied fast-paced enterprise environment.
- Developed customer service skills through interfacing with clients, support, and development teams of accredited suppliers over the phone, to investigate API faults of third party software for the flagship application EMIS Web. This involved negotiating problem resolution strategies and technical writing to suit each of those stakeholders.
- Developed technical skills through investigating API faults for third party suppliers, interpreting C# stack trace, peer-reviewing T-SQL scripts for estate-wide configuration and issue diagnosis, creating Python automation scripts for repetitive problem management, and problem handling network transmissions using in-house tools and Wireshark, contributing many such resolutions to the support knowledge base.

Education

Newcastle University
Newcastle, England

MSc. Computer Science (Distinction)
September. 2016 - December. 2017

- Achieved a distinction and final average of %78 raw marks.
- Awarded the Colin Graham Award from Accenture as team leader of the best team project across the Newcastle University School of Computing.

University of Leeds

Leeds, England

BA. Philosophy (2:2)

September. 2012 - July. 2015

- Achieved 80% in programming electives, focusing on Python project development, and usability and accessibility considerations, marking where I first discovered a passion for software engineering.
- Through analysis our interpretation of mathematical formula and scientific hypothesis in modern physics, I developed linear algebra and claims-analysis skills, which have helped throughout my career to simplify complex concepts, determine whether customer requirements can be said sufficiently elicit, and evaluate strategy and solution design for added corporate value.

Projects

Real-time analysis for a web-application (personal-website)

Private Repository

Personal Project

January. 2019 - Present

- A raw-ingest processer (written in Java) batches responses from a test-websocket serving as a streaming endpoint and writes to a Kafka stream. An enrichment processor consumes that data and batch writes in chunks to a seperate topic. The next development stage is to consume and cache that data via a Node.js (or Elixir) server-backend and visualise that data using React.js libraries as part of the stack.

Real-time public sentiment analysis

Private Repository

Technical Assessment, Hortonworks

December. 2018

- Scored as excellent for a technical challenge to use search functionality to view streamed data in real-time to gather insights as it arrives in the Hortonworks HDP Sandbox. I collected and enriched data by building a distributed Apache NiFi configuration, and a bespoke Python client developed to meet the solution need. This produced Avro formatted data-sets streamed to Apache Hive to provide views for analyzing social sentiment. I developed Hive external tables and indexed those to Solr which were queried by Apache Zepplin to create charts to visualize the data inside the sandbox. The challenge provided insight on how to professionally de-compose and manage large volumes of data (with throughput reaching 4GB/s on local VM's), and experience configuring and troubleshooting production-ready Hadoop project environments.

An application to best support student education in semantics and best practices of object-oriented programming

Available on Github

Masters Thesis, Newcastle University

June. 2017 - September. 2017

- Provided a software solution which best facilitates student education of the Java programming language by the means of educating the semantics of object-oriented programming as associable with the best practice of object-oriented programming. This involved in-depth qualitative research into establishing the best practices of object oriented programming as associated with understanding the kinds of meaningful language we use when talking about concepts in object-oriented programming, and quantitative research to identify correlations between student failure in Java based courses and how they connect their understanding of those terms.
- I performed statistic analysis of academic studies in pedagogic strategies to devise a solution to best teach those students the semantics and best practices of object oriented programming (to justify choosing a single strategy from a disjunction). This involved market research to existing solutions and how existing technologies can be integrated with the proposed solution.
- Using a waterfall process-model I delivered a software solution utilizing a stack of loosely coupled Django applications organised into a layered architecture each designed using the single responsibility principle. The application stack allowed for lecturers to serve course-content to students to teach the semantics and best practices of object oriented programming in Java based on student learning styles on a platform with user friendliness in mind. Serving of that course-content was provided by generating internal virtual hosts on allocated ports. This was achieved integrating Docker with Django (via the Python Docker SDK) to launch containerized NGINX web-servers to best scale, maintain, and deliver static-HTML course-content and additional features for end users, such as isolating a Java compilation environment. Users were dynamically proxy passed to the suitable service. The effectiveness of the solution was then measured by re-assessment of student scores in a Java exam, now better armed with knowledge of OOP best practices.

A railway-network timetable management client and optimised search engine

Available on Github

Group Project, Newcastle University

December. 2016 - May. 2017

- For a mock railway service application (similar to 'trainline.com') written in PHP, I acted as group project team-leader, the focal point for group meetings and managing an agile development process. My key responsibilities included organising meetings, designing and modularizing the solution architecture, motivating feedback from team-members, escalating significant risk to the project as necessary, splitting the designed solution into manageable sets of objectives and milestones and ensuring they were met, and problem management (i.e. regularly supporting team members and troubleshooting their code in one-to-one sessions).
- I was solely responsible for the research, design, and implementation of a unique fastest time routing algorithm for the web-application, and presenting the overall implementation to examiners. The designed algorithm represented train-arrivals at stations by making a conjunction between train-times and station entities in a MySQL database, to then produce a data-structure of event-based nodes. The topology of connected-nodes thus identified which connecting train-times and stations were reachable from train-arrival events. Searches for fastest train times from A-B could then be performed using a depth-first search through connected nodes.

Tournament matchmaking client

Available on Github

Personal Project

December. 2015

- Developed an application using a custom algorithm to rank, swap, and organize a database of active users on a gaming server into manageable sets (teams) of users of the same average rank apt to compete against each other in an online video game tournament.
- Produced and hosted that tournament using an NGINX RTMP server to broadcast to the larger involved community.

Switch configuration client

Available on Github

Hewlett Packard Enterprise

December. 2014

- Delivered a network capable leveraged configuration management tool for deployment of a large number of stacked switches containing mixed switch models to Hewlett Packard Enterprise environments, requiring a degree of flexible options to create the appropriate stack mix.