

Sam Ross

Graduation Date: July 2023

samross567@gmail.com • [LinkedIn](#) • 07521254020 • 25 Camden St, BT9 6AT, Belfast, UK

PERSONAL PROFILE

A highly motivated, upcoming Software and Electronic Systems Engineering graduate with 1.5+ years commercial experience. Enthusiastic, has an exceptional work ethic, and is proficient in a variety of modern languages and frameworks. Seeking a Back-End position in an ambitious company to further improve as an engineer and positively contribute toward a company's success.

EDUCATION

- 2023** Queen's University Belfast (Russell Group) - BEng Software and Electronic Systems Engineering (Including Placement): 84% (First Class Honours)
- 2019** A LEVEL: A*AA - Maths, Physics, Biology
- 2018** AS Level: AAAC - Maths, Physics, Biology, Further Maths
- 2017** GCSE: A*A*A*AAAABB - Maths, Further Maths, Biology, Physics, Chemistry, Technology, RS, Computer Science, English
-

TECHNICAL EXPERTISE

- Programming:** Java, Spring Boot, C++, Python, JavaScript, React JS, SQL
- Cloud:** AWS, EC2, S3, OpenSearch, EKS, Lambda, CloudWatch, KMS, SQS, ElastiCache, RDS, GCP App Engine
- Development:** Terraform, Maven, Kubernetes, Docker, Jenkins (CI & EKS), Spinnaker, DataDog, Redis, Git, Slack, Bash
- Databases:** Elasticsearch, PostgreSQL
- Operating Systems:** Windows, MacOS
-

SOFTWARE ENGINEERING WORK EXPERIENCE

Systems IT Technician University Library - Belfast

Nov 2022 – July 2023

- Working in a strong team to provide solutions to hardware/software problems throughout the library system.

Data Structures and Algorithms (C++) University Lab Demonstrator - Belfast

Sept 2022 – March 2023

- Mentoring Year 2 Computer Science Students in their Data Structure and Algorithms module practical sessions.
- Teaching the students how to use C++ effectively to build complex data structures and algorithms from scratch.
- Demonstrating Big-O Notation and useful algorithm optimisation techniques to improve system performance.

Rapid7 Software Engineering Intern (15 months) - Belfast

June 2021 – August 2022

- Joined Rapid7 for 12 months as a Back-End/API software engineer for my degree placement year. Received a graduate job offer and a summer extension offer. Continued working there over the 3-month summer extension offer.
- Wrote clean, robust, production code in Java, for the Spring Boot microservice applications which make up the Back-End of Rapid7's most popular web product. Engineered new APIs from scratch, utilising Maven dependencies and OpenAPI to improve the efficiency of endpoint creation and alteration.
- Gained valuable experience integrating Spring Boot applications with Elasticsearch and PostgreSQL databases – creating new endpoints to interact and retrieve data from these databases in the required format.
- Developed a valuable knowledgebase and skillset with many different AWS services over the 15 months, utilising technologies such as Terraform for building infrastructure in staging and production.
- Saved the company over £12,000/month by optimising the AWS expenditures and decommissioning old/obsolete clusters. Entered these savings into Rapid7's yearly AWS bill-saving competition, where I presented these optimisations to the company.
- Utilised modern technologies such as Kubernetes, Jenkins EKS, and Spinnaker for deployments.
- Communicated and formed strong relations with other teams within the company, to gauge requirements and enable cross-team integration – facilitated by various cross-team endpoints and API keys.
- Gained valuable insight into Back-End system design/architecture, learning from experienced team members.
- Contributed proactively to every team meeting - preparing effectively before each meeting when necessary.
- Developed proficient code review skills, both in receiving feedback and giving feedback to other team members.
- Mentored and coached multiple new interns into the team, giving whiteboarding and pair-programming sessions.

QLab Software Engineering Internship (4 months) - Belfast

May – September 2020

- The project goal was to simulate the effects that minor manufacturing defects would have on QLab's AR2 robot arm.
- Integrated OpenSCAD (JS CAD program) with ThreeJS and AmmoJS (JS graphics and physics libraries) to facilitate the testing of the AR2 Robot Arm CAD models in a realistic physics engine.

PROJECTS - <https://github.com/sam-ross>

Smart Wireless Sensor Project ESP32 C++ (November 2022 - April 2023) – [GitHub Project Link](#)

- Final year project to create a smart microcontroller embedded solution to augment Digital Fault Recorders (DFRs) in substations. The transformer 3-phase system signals are fed into two 1200SPS ADCs. C++ algorithms then run on the digital sample readings to calculate useful live measurements – which are made available through external communications.

Concurrent Programming Competition (December 2022) – [GitHub Project Link](#)

- Second place. Utilised memory mapping to read large 2Gb graph files directly into memory. Assigned 12 threads in parallel to read the graph files from memory very efficiently. Optimised the Disjoint Set Algorithms to run concurrently using atomics

Smooovie Webapp Project (August 2022) – [GitHub Project Link](#)

- Designed and engineered a full-stack web app from scratch. Utilised Java with Spring Boot for the Back-End and ReactJS for the Front-End. The web app makes use of 2 public APIs for retrieving subtitle data.
- Deployed on Google Cloud Platform using App Engine

Smart Greenhouse Air Quality Monitoring System IoT ESP32 & BME680 (Spring 2021)

- Worked in a team to design and engineer a Smart Greenhouse Embedded System. A UI was set up for the ESP32 using an LCD screen with a navigation menu and a keypad for user input. The system makes use of the BME680 environmental sensor and if for example the temperature or humidity exceeds a user-defined limit, motors will open the greenhouse windows.
- An IoT web server was developed on the ESP32 as a station so that users on the same WIFI network can access a website to view the live Greenhouse data and adjust the user-desired limits for temperature, humidity, etc.

Machine Learning Model for Classification of Letters, Numbers and Symbols (Spring 2021)

- Built a machine learning model from scratch which performs classification on a dataset of letters, numbers, and symbols, to differentiate between them. This was completed as part of the AI and Machine module and this project was graded 96%.
- Fitted a range of different types of classifiers to the dataset, to build and evaluate useful models that can predict the class labels for unseen images. Used logistic regression, k-nearest-neighbour 3-way classification, random forests, xgbTrees, etc.

QLab Summer Internship Project – [OpenJSCAD Robot Arm to Three.js/Ammo.js \(May - September 2020\)](#)

- Developed a way of importing OpenJSCAD CAD models into Threejs/Ammojs as functional 3D physics models along with realistic physical properties so that QLab could simulate the effects of minor manufacturing defects on the robot arm.
- Programmed mostly in JavaScript and used technologies such as Threejs, Ammojs, Flask Server, and OpenJSCAD.

Arduino Mega 2560 Maze Solving Robot (Spring 2020)

- Designed, built, and programmed an Arduino Maze Solving Robot (using Arduino C). This was a group project done as part of an assignment for the Embedded Systems module.

Electronic Dice Project (Spring 2020)

- Designed, constructed, and tested an E-dice, made on a double-sided PCB as part of the Electronics module.

Java Compile-Time Analyser (Autumn 2019)

- Created a Java compiler-time analyser as part of an assignment for the Procedural Programming module and obtained 100% in the assignment.

Kainos Code Camp Website - Workrite (2018)

- Built a Front-End landing page for a DIY freelancing company (using HTML, CSS, and JS) in the 2 weeks of attending the code camp and gave a presentation on the final website to the camp.

Bug Population Program (2016-2017)

- Developed a program that predicts population numbers of future generations of bugs using C# in Visual Studio.

GameZoc Website (2015-2016)

- Programmed the Front-End of a game forum website (using HTML and CSS) and implemented the Back-End database connections (using PHP) which allowed other users to create accounts and to add, edit and delete posts.

ACHIEVEMENTS

- Achieved second place in the Queen's University Belfast Concurrent Programming Competition
- Received a school's honours pocket for representing Northern Ireland in the London Mini Marathon and for athletics
- Received multiple prize night awards at secondary school including A-Level Award of Excellence
- Bronze Duke of Edinburgh award
- Silver award in the UKMT maths challenge
- Full UK driving license

INTERESTS AND HOBBIES

- Mountain biking and road biking regularly for over 15 years
- Rock climbing with the Queen's Mountaineering Club for over 3 years
- Enjoy reading and playing guitar
- Read blogs and newsletters to keep up to date with the tech industry