Alexander Samuel Roberts

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Versatile, dedicated and hard-working MSc Big Data Analytics student at Birmingham City University. Always seeking further experiences and challenges. Additionally, I have a great deal of knowledge and experience in software development, web development, databases, data analysis and machine learning. I am currently operating in the West Midlands.

EDUCATION:

September 2024 – September 2025

Birmingham City University — MSc Big Data Analytics

- **Data Mining (in progress) —** exploring how several data mining and machine learning algorithms can be applied to data to discover new knowledge. The coursework includes investigating a large dataset (stock market data) for information discovery which would theoretically benefit a target audience (e.g., investors).
- **Applied Statistics (in progress) —** learning how essential statistical knowledge impacts information discovery and Probability Theory. This includes the importance and impact of distributions.
- **Advanced Databases (in progress) —** advancing current understanding of how to construct relational databases effectively to meet business needs and rules. This involves designing and implementing Enhanced Entity-Relationship Diagrams using SQL and an Oracle Express Server.

September 2021 – August 2024

Birmingham City University — BSc (Hons) Computer and Data Science, First Class

- **Artificial Intelligence and Machine Learning (80%) —** advanced understanding of data visualisation, exploratory data analysis (EDA) and data manipulation, and how traditional machine learning algorithms could be applied. A range of different data, such as that in tabular or CSV format, were examined and visualised. Final coursework included key stages such as detailed EDA of statistical tabular data of Abalone fish species, data preprocessing, model development, model improvement and model evaluation. This was achieved using Python packages and libraries, and Google Colab.
- **Data Management and Machine Learning Operations (84%) —** learned how to construct and maintain data pipelines using Apache Airflow for tasks such as machine learning or ad-hoc querying. Processes such as Extract, Load, Transform (ELT) were discussed and applied. Additionally, the containerisation technology Docker was used for hosting a MariaDB ColumnStore data warehouse.
- **Modern Data Stores (75%)** — gained new knowledge and insight into the similarities and differences between traditional relational databases and more modern distributed NoSQL databases. The final coursework included implementing a locally distributed MongoDB cluster using Docker Compose, then populating it with synthetic data, and running custom queries using JSON. As well, other data transportation languages such as XML were discussed and practiced.
- **Deep Neural Networks (76%)** — took a deeper dive into machine learning by learning about Artificial Neural Networks, particularly how these can be leveraged for larger amounts of data and more complex data types. Final coursework leveraged Python Keras and Google Colab to construct a convolutional neural network that can classify lung X-ray images into certain infection categories.
- **Individual Honours Project (78%)** — this concerned investigating to what extent road traffic collisions in Smart Cities could be predicted using open-source data and a Long Short-Term Memory Neural Network. This included designing and constructing two data pipelines to help automate the model creation and prediction processes. The Waterfall methodology was used for this project development, but the Agile methodology was also researched.

2019 – August 2021

Blessed William Howard High School Sixth Form — A-Levels

- Chemistry: Grade A, practical endorsement: pass
- Biology: Grade A, practical endorsement: pass
- Mathematics: Grade A

2016 – 2019

Blessed William Howard High School Secondary School — GCSEs

Nine 8-5 grades including Mathematics (8) and English Language (7)

EMPLOYMENT HISTORY:

Sept 2022 – Present

Visiting Demonstrator for Computing & Digital Technology — Birmingham City University

- Pro-actively support computing students with their practical and theory work during lab sessions.
- Explain/elaborate concepts and illustrate them in an easy-to-understand way.
- Converse with and support a range of students, working together to resolve problems and make new discoveries.

July 2024

Count Porter for the UK General Election 2024

- Worked effectively in a team and kept to a busy schedule on General Election night.
- Took on additional responsibilities to help maintain a steady workflow.
- Completed a multitude of tasks in a busy environment while maintaining a calm and professional attitude.

VOLUNTEER EXPERIENCE:

Aug 2022 – Present

Librarian — Community Library

- Maintained and organised information and materials.
- Communication, coordination and teamwork are applied throughout between the small group of volunteers.
- Complied to the organisation's policies, procedures and processes. Examples include Data Protection and GDPR.
- Resolved any computer problems some users experience, and explained how the issue was fixed. The specifics vary, but this requires being able to explain technical problems to a non-technical user.
- Frequently applied customer service and communication skills when speaking with users.

SKILLS:

- Coding: Python, Java, F#, C++, Git, GitHub, Google Colab.
- Databases: SQL, MySQL, Oracle SQL, MariaDB, ClickHouse, MongoDB, Docker.
- Web dev: HTML, CSS, JavaScript, TypeScript, PHP, Laravel, NodeJS, Vue, React, TailwindCSS, Vite.
- Data Analysis and manipulation: Python Matplotlib and Seaborn, SciKit Learn, Keras, PyTorch, Imbalanced Learn, R Programming.
- Other: Linux/Ubuntu, fundamental DevOps.

I AM A BRITISH CITIZEN AND HAVE THE RIGHT TO WORK IN THE UNITED KINGDOM.

REFERENCES AVAILABLE UPON REQUEST.