Rachel George

BSc (Hons) Computer Science
University of Birmingham

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ABOUT ME

Second-year Computer Science student with a strong foundation in programming, algorithms, and software development. Passionate about problem-solving and eager to apply my knowledge in real-world projects. Actively expanding my skills in artificial intelligence, data structures, and designing optimal solutions for problems with a focus on building a career in the tech industry.

EDUCATION

BSc (Hons) Computer Science (FT) – 2026
University of Birmingham, UK

- 1st Year – First with a grade average of 80%
  - Modules: Object-Oriented Programming, Data Structures and Algorithms, Mathematical and logical foundations of Computer Science, Artificial Intelligence, Theories of Computation, Full-stack application development.

A-levels – 2023
Altrincham Grammar School for Girls Sixth Form, UK

- Maths — A
- Physics — A
- Chemistry — A
- Further Maths — B

GCSEs – 2021
Altrincham Grammar School for Girls, UK

- Biology — Grade 9
- Chemistry — Grade 9
- English Literature — Grade 9
- Geography — Grade 9
- German — Grade 9
- Maths — Grade 9
- Physics — Grade 9
- Computer Science — Grade 8
- English Language — Grade 8

SKILLS

- Problem solving
- Lateral thinking
- Maths dexterity
- Teamwork
- Time Management
- Interpersonal Communication

TECHNICAL SKILLS

- Highly proficient in Java and Python.
- Proficient in Git and GitHub.
- Strong understanding of data structures and algorithms; able to analyse time complexities and identify the benefits of using different algorithms and data structures to solve specific problems.
- Proficient in Artificial Intelligence and Machine Learning, experienced in optimisation problems, clustering (K-means, KNN), gradient descent, linear and logistic regression and conducting both informed and uninformed searches.
- Solid understanding of theories of computation, including computability, complexity (decidability, P vs NP, NP-hard, NP-complete), and designing optimised automata and mathematical proofs.
- Experience working with front and back-end web development technologies such as HTML, CSS, JavaScript, and PostgreSQL.
- Strong analytical and mathematical skills

CERTIFICATES

- 'Pandas' on Kaggle
- 'Intro to Machine Learning' on Kaggle
- 'Intermediate Machine Learning' on Kaggle
- 'Intro to SQL' on Kaggle

ACHIEVEMENTS

- **Completed Bright Network's Internship Experience UK 2024: Technology**
  - Selected as a "Top 50 VIP" participant due to my engagement and work produced, leading to an exclusive invitation to a networking event at BT Group
- **UK Bebras Computational Thinking Challenge**
  - Certificate of distinction in 2019 and 2022 for being in the top 25%
  - Best in School and Gold Award in 2021 for being in the top 10% nationally, l
- **United Kingdom Mathematics Trust (UKMT)**
  - Achieved Silver Certificates in 2017, 2019, 2020 and 2021 for being in the top 20%
  - Achieved Bronze Certificates in 2018, 2022 and 2023 for being in the top 40%
  - Chosen to represent my school in the 2018 Regional Finals of the UKMT Team Challenge, which focused on Maths dexterity, teamwork and communication. Our team placed 5th out of the 27 regional teams
- **Invited to Mathematics Masterclasses by the University of Liverpool after placing 3rd in the MEM Challenge**

❖ **Mathematical Education on Merseyside Challenge (MEM)**
Complex mathematical problems which require an ability to think logically to solve.
- Achieved Third Prize, Best in Year and Best in School Awards in 2017, 2018 and 2020
- Achieved Certificate of Merit, Best in Year and Best in School Awards in 2019

❖ **International Atomic Energy Agency (IAEA) Student Video Competition 2022**
- Global winner from 301 entries from 34 countries
- Taught myself to use Adobe Premiere Rush and was in charge of video editing

❖ **Bronze Certificate in the Chemistry Olympiad in 2022**

❖ **Silver Certificate in British Physics Olympiad (BPHO) in 2021**

❖ **National Citizen Service (NCS) (August 2021)**
- Met new people and adapted to work with them efficiently, improving my teamwork and leadership skills.
- Communicated with organisations to collect donations by utilising my skills in public speaking.

PROGRAMMING EXPERIENCE

Python
- Developed a CNN- based deep learning model to recognise facial expressions from 48x48 pixel grayscale images using a Kaggle dataset. Implemented in Python, with TensorFlow, Keras, Pandas, NumPy, Matplotlib, and Scikit-learn.
- Wrote a program to simulate a two-player dice game.

Java
- Created a news classifier
  - Cleaned, lemmatized, and removed stop words from document text as part of NLP.
  - Used TF-IDF embedding to convert text documents to vector representations and calculated cosine similarity to group articles based on their semantic closeness
- Created an advanced news classifier using GloVe Embedding and Machine Learning
  - Read GloVe files and stored vector representations using BufferedReader and ND4J arrays.
  - Implemented object-oriented principles, such as inheritance and polymorphism.
- Developed a 3-tier, TCP-based, multi-threaded client-server application for querying a vinyl records database.
  - Built a JavaFX GUI for client requests, with an intermediate server handling queries
  - The server used JDBC to connect to the database, process queries, and return results to the client.

HTML, CSS, and JavaScript
- Created a portfolio website as a personal project.

PostgreSQL
- Used PostgreSQL to develop robust, scalable and secure databases, ensuring efficient data management and retrieval.
- Created tables using CSV files and queried them too.

WEKA
- Efficiently handled complex datasets, performed comprehensive analysis, and visualised findings to support data-driven decision-making.

WORK EXPERIENCE

Goldman Sachs Software Engineering Virtual Experience Program on Forage – (September 2024)
- Cracked passwords using Hashcat and proposed enhancements for stronger password protection, including updated hashing algorithms and length requirements.

JPMorgan Chase Software Engineering Lite Virtual Experience Program on Forage – (September 2024)
- Created a new class to complete an existing system in the credit card rewards department and wrote a test suite for the class added.

Tesco Colleague – (December 2021 & July 2023 – September 2023 & December 2023)
Efficiently operated the tills and self-scan, ensuring the accurate management of cash and card payments. Worked on shop floor to rotate stock.
- Thrived in a high pressure, fast paced retail environment.
- Improved communication skills and achieved excellent customer satisfaction.

Arup Design Programme – (July 2022)
Designed a nature park to meet a specific project brief
- Refined public speaking skills by pitching to a panel of industry experts.
- Learnt about collaboration and delegation by working as part of a team.

White Rose Physics Virtual work experience – (July 2022)
Created a poster on Goldilocks Zones and habitable planets, based on expert lectures and research.
- Presented findings publicly, enhancing public speaking skills and improved Excel skills for data visualisation and Word skills for poster design

Tutoring – (July 2021 – August 2022)
Tutored in maths, comprehension, spelling and non-verbal reasoning.
- Improved communication, organisational skills, and leadership skills by creating lesson plans personalised to the student to help build upon strengths and build confidence.