

# Rachel George

BSc (Hons) Computer Science  
University of Birmingham



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[Rachel Portfolio Website \(rgeorge8.github.io\)](https://github.com/rgeorge8)



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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*

- 1<sup>st</sup> 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, I
- ❖ **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 5<sup>th</sup> 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.

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## 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.

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## 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.