

# Alan Metwally

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<https://github.com/AlanMet>

A highly motivated Computer Science undergraduate with 7 years of programming experience, specializing in software engineering and AI. Passionate about solving challenges with innovative tools and contributing to cutting-edge projects like AI security. I am eager to bring my technical expertise and growth mindset to support the development of exceptional games and tools.

## Education

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### University of Portsmouth

*BSc in Computer Science*

2023 – Present

- Engaged in hackathons and programming competitions, collaborating in teams to solve complex problems under time pressure.
- Influenced AI research, exploring new machine learning algorithms for defence.
- Developed a personal project implementing a neural network in Dart from scratch.
- Participated in hackathons and programming competitions, including the **UKIEPC (UK and Ireland Programming Competition)**.
- Gained experience with AI and software engineering concepts.
- Hands on Microsoft Azure experience.

### Barton College, Eastleigh, UK

*A-levels in Mathematics, Computer Science, Physics*

2021–2023

- Completed a Q-extra course and GCSE in Japanese.
- Learned the basics of Haskell, Assembly, and Backus-Naur Form.
- Recreated **Zork in C#**.

### Brookfield Community School, UK

*GCSEs*

2019–2021

### Cairo English School, Egypt

*IGCSEs*

2009–2019

## Experience

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### Software Engineering Projects

- Built a **Discord bot** during the pandemic with over **2000 lines of code**, integrating SQL for server data management.
- Created a remake of 1977 text-based adventure game **Zork in C#** implementing a **complex command parser** and object-oriented design.
- Simulated operating system features in Java, demonstrating concepts like mutual exclusion and multithreading.
- Developed a prototype **dashboard using PHP, Python, and HTML/CSS**, with PayPal API integration.

- **Cryptocurrency Blockchain Project:** Built a "cryptocurrency" from scratch in Python, which was essentially a blockchain, to deepen my understanding of decentralized technologies and cryptography. This hands-on project allowed me to implement key concepts of blockchain such as hashing, digital signatures, and block linking.

## AI and Machine Learning

- Created an AI in Dart from scratch, achieving **95% accuracy** on sample data.
- Contributed to a research paper on federated learning in collaboration with AI experts.
- Developed a reinforcement learning game of Tic-Tac-Toe using Q-learning.

## Hackathons and Teamwork

- Built a community chat website using a **Raspberry Pi**, demonstrating teamwork and hands-on development.
- Collaborated with a team to create a **browser for cat images** in JavaScript, enhancing back-end and front-end features.
- Designed a **LAN structure** and a **relational database** for a simulated company, focusing on cost and efficiency.

## Skills

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**Programming Languages:** Python, Dart, C#, Java (basic), PHP, SQL, HTML/CSS.

**Azure:** Hands-on experience with Microsoft Azure through the AZ-900 course.

**Game Development:** Basic experience with **Unity** and **Blender**.

**Tools and Frameworks:** VSCode, SQL databases, Discord bot development.

**AI and Machine Learning:** Federated learning, reinforcement learning.

**Web Development:** Front-end and back-end development, API integration (e.g., PayPal).

**Languages:** English (fluent), French (fluent), Arabic (Egyptian dialect), Japanese (GCSE level).

## Other Interests

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- **Love for Learning:** Passionate about Physics, Computing, Engineering, and Economics, with a particular interest in the history of mathematics. I find topics like the use of logarithms to simplify multiplication and the evolution of symbolic notation especially fascinating.
- **Astronomy and Physics:** Enthralled by celestial mechanics, Kepler's solar system model, and theories on black holes, with a focus on their implications for understanding the universe.
- **Rocket Industry:** Follow developments in space exploration, including the progress of reusable rockets and innovations by private space companies.
- **Genetic Engineering:** Intrigued by CRISPR and its potential to transform life sciences, particularly the ethical considerations surrounding its power to alter ecosystems and human genetics.
- **Open-Source Contribution:** Actively contribute to personal projects on GitHub, refining my technical skills, collaborating with others, and staying engaged with the development community.
- **Innovation and Learning:** Focused on staying informed about emerging technologies in AI, computing, and engineering, continuously expanding my knowledge through books, documentaries, and online resources.

## Relevant Learning

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- **Books:** *Brief Answers to the Big Questions* by Stephen Hawking, deepening my understanding of cosmology and the universe. *The Black Holes at the Edge of All We Know* by Brian Cox, which

enhanced my understanding of black hole theories and their cosmological significance.

- **Videos:** *This Book Should Have Changed Mathematics Forever* by Welch Labs, which explores the role of logarithms in simplifying multiplication and mathematical notation.