Alan Metwally

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https://github.com/AlanMet

I am an **enthusiastic** and **dedicated** computer science student with **extensive experience** in **AI**, **software/web development**, and **mathematics**, particularly in **discrete maths** and **calculus**. I am eager to apply my skills and passion for science to contribute to cutting-edge projects at CERN, where my deep **technical** skills and problem-solving aligns with the organization's mission to explore the fundamental building blocks of the universe.

Education

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

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 the 1977 text-based adventure game **Zork** in **C#**, implementing a complex command parser and **object-oriented design**.
- Simulated operating system features in **Java**, exploring **concurrency** and **multi-threading** concepts such as **mutual exclusion**.
- Developed a prototype dashboard using **PHP**, **Python**, and **HTML/CSS**, with **PayPal API** integration.
- **Cryptocurrency Blockchain Project**: Built a "cryptocurrency" from scratch in **Python**, essentially a **blockchain**, to deepen understanding of **decentralized technologies** and **cryptography**.

- Implemented robust database solutions using **MySQL** and **PostgreSQL** to enhance data management and performance.

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

Programming Languages: Python, **Dart**, **C#**, **Java**, **JavaScript**, **PHP**, **SQL**, **HTML/CSS**
Databases: MySQL, **PostgreSQL**
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

- **Love for Learning:** Passionate about **Physics**, **Computing**, **Engineering**, and **Economics**, with a particular interest in the history of mathematics. Fascinated by topics like the use of **logarithms** to simplify multiplication and the evolution of **symbolic notation**.
- **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 technical skills, collaborating with others, and staying engaged with the development community.
- **Innovation and Learning:** Stay informed about **emerging technologies** in **AI**, **computing**, and **engineering**, continuously expanding knowledge through books, documentaries, and online resources.