Abdullah Rafiq

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Education

MSc in Space Engineering with Distinction *Sept 2023 – Dec 2024*
University of Birmingham

- **Modules:** CubeSat Design; Space Environment; Human Spaceflight Critique; Spacecraft Mechanical Design; Advanced Space Mission Analysis and Design; Materials and Manufacturing for Space Applications; Communication, Ethics and Teamwork for Space Missions

BSc in Computer Science with First Class Honours - GPA: 4.25 *Sept 2020 – July 2023*
University of Birmingham

- **Modules:** Software Engineering; Maths and Logic; Data Structures and Algorithms; Artificial Intelligence; Functional Programming; Full Stack Development; Systems Programming in C/C++; Human Computer Interaction; Mobile and Ubiquitous Computing; Theories of Computation; Object-Orientated Programming

Secondary Education *Sept 2012 – July 2020*
West Walsall EACT Academy

- **A Levels:** Mathematics = A, Physics = A, English Literature = A
- **GCSEs:** Mathematics = 9 , English Literature & Language = 8, Physics = A*, Chemistry = A*, Performing Arts = Distinction*, Biology = A, History = A, Geography = A

Employment & Volunteering

Deep Space Network Missions Operations Engineer *Helston*
Goonhilly Earth Station *Feb 2025 - Present*

- Conducted routine and critical real-time operations of a ground station, ensuring systems performed as required and adhered to established procedures, including anomaly investigation and resolution processes
- Supported the development of procedures, tests, and health and performance trend analysis at the system and subsystem levels, collaborating with mission teams in a structured operations environment
- Utilised technical expertise in Linux systems, developing software in order to support mission success
- Developed a trajectory data converter in C, using NASA's SPICE Toolkit and the Horizons API, to allow for the conversion of trajectory files between different formats and reference frames

Data Administrator *Walsall*
Palfrey Health Centre *June 2023 – Dec 2024*

- Used and improved knowledge of databases and employed SQL to ensure that patients who met specific criteria were recieving the appropriate treatment, working alongside clinicians in a multidisciplinary team
- Researched and implemented security techniques, alongside ensuring compliance with data protection laws, to ensure that data was stored safely and that it was consistent and accurate
- Led the development of a new invoicing system in Python, allowing for safe and secure payment management and leading to the administrative staff having greater time to focus on patients

Listening Volunteer *Birmingham*
Samaritans *Jan 2021 - Jan 2023*

- Employed a high level of empathy, communication and rapport while listening to callers and paying attention to detail, to best provide support to vulnerable individuals
- Maintained a calm and clear mind throughout high-pressure situations so that the correct procedures were followed, and callers could be supported in the appropriate manner

Director & Software Engineer *Walsall*
Happy Bucket *Mar 2019 - Oct 2020*

- Designed and developed unique and creative features for a well-being and mental health application that ensured the platform solved real user problems and provided mental health support to users

- Managed a smaller team that worked and communicated concisely on regular occasions, alongside other directors in a team, so that we all had a shared vision and so that the platform would continually evolve
- Employed the use of PHP, HTML, CSS and SQL to develop a website that delivered an intuitive and responsive user experience, supporting the application's core functionality and enhancing accessibility

Projects

Galax-C - Space-Focused Programming Language (In Progress)

- Development of a C-based programming language that incorporates built-in functions for space engineering (and eventually astrophysics), allowing users to calculate space-specific computations
- Designed with simple syntax to streamline complex calculations, making it more accessible for individuals in the space industry and ensuring that it is efficient for Space Engineers
- Aimed at providing tools for professionals in the space industry to prototype and test concepts quickly without needing to rely on proprietary software or complex mathematical tools

Rover Wheel Evaluation Using Evolutionary Algorithms

- Tested different wheel profiles and used an evolutionary algorithm to find the optimal wheel for traversing terrains, including rocks of different sizes, and evaluated against mobility criteria
- Used Python, ZeroMQ and CoppeliaSim to find a relevant optimisation technique and test on race tracks in both simulated and physical environments, obtaining a greater understanding of planetary rover mobility
- Explored unique wheel concepts such as Steinmetz solids, and used these alongside an appropriate fitness function to find the optimal wheel design and improve analytical skills

ROTULUS - University-Led Novel 3U Drag Sail CubeSat Mission

- Coordinated in a team on a CubeSat mission that aimed to demonstrate the deployment of a novel 3U drag sail design and the accelerated de-orbit of the deployed drag sail from a densely populated LEO orbit
- Worked as the deployment mechanism lead, exploring, analysing and developing ideas at different technology readiness levels for the deployment of the drag sail, using software such as MATLAB and SOLIDWORKS
- Made use of concurrent engineering concepts such as ESA's COMET to help work more effectively and gained an understanding of the AIT process

F10.7 Flux Density Prediction Tool

- Used Python and MATLAB to predict F10.7 flux density to help make predictions about the solar cycle, and therefore predict space weather and potential geomagnetic storms
- Applied knowledge of space weather and solar activity, such as sunspot numbers and other flux densities, to help improve the model and increase accuracy in predictions
- Made use of neural networks (such as LSTM) to analyse time-series data, enabling more accurate long-term predictions of solar activity and improving the model's ability to forecast fluctuations

Warrior - Exploring the Limits of AI in Narrative-Driven Games

- Furthered studies from other academics on how far we can change the way AI is used in storytelling and how we can produce unique experiences for each user that go beyond tree-based structures
- Used C# and Python to help create an experience that is fully determined by how the user reacts, and used a 'bag of beats' structure in order to have an engaging, yet dynamic and continually updating, narrative

Additional Skills & Interests

Technologies

- Experience with Java, C#, C, C++, Python, HTML/CSS, JavaScript, SQL, Haskell, Swift, Matlab, CoppeliaSim, PHP, GitHub, GitLab, OpenCL, SPICE, Emis Web & Docman

Other

- Acted in multiple theatre productions and musicals, alongside starring in a range of music videos and partaking in amateur film-making, as well as having the ability to play bass guitar, guitar and piano
- Part-time coach of an under-16 MMA club, supporting students who come from less privileged backgrounds
- Full UK driving license holder