Hashim Rafiq

+44 7847 207714 | hashim.rafiq332@gmail.com | linkedin.com/in/hashim-rafiq | github.com/hashim332

EDUCATION

University of Nottingham   Sept. 2020 – May 2023
Bachelor of Science in Physics   *Nottingham, UK*
- Modules include Scientific Computing, Symmetry and Action Principles, Theoretical Elementary Particle Physics, Molecular Biophysics and Soft Condensed Matter
- Brazillian Jiu Jitsu & Self Improvement Societies

Ruislip High School   Aug. 2017 – May 2020
4 A Levels; Physics (A), Maths (A), Biology (A), and Chemistry (B)   *London, UK*

PROJECTS

Traffic Flow Simulation | *Python*   2022
- Mathematically modelled flow of traffic on a single lane road via a simple cellular automata model with a periodic boundary condition to simulate driving in a loop and investigate how traffic build-ups evolve over time
- Each car occupied a site on the road and must obey the ruleset of acceleration and deceleration and implemented randomised driver behaviour to induce traffic jams
- Expanded investigation to a road-works/smart motorway simulation by stopping cars at random points to see how this effected traffic flow

Investigating Water Waves and Modelling Tsunamis | *Python*   2023
- Planned 12-week project investigating the behaviour of water at shallow heights to simulate tsunamis
- Simulated shallow water behaviour including surface tension to be checked experimentally, then extrapolated model to larger wave height simulations by omitting shallow effects and including deep water phenomena into the model such as the Shoaling effect
- Maintained an extremely detailed lab diary and wrote a scientific report discussing the relation between wave speed and Shoaling effect, which governs tsunami behaviour

Nearest Neighbour of N Points in Periodic Cube | *Python, NumPy*   2022
- Optimised nearest neighbour for N number of points code in a periodic cube (similar to lattice structures in crystals)
- Understood the differences between efficient and inefficient coding practices and how to optimise subroutines which make up a larger program
- Initial code ran through 20000 sample points to find the nearest neighbours of each point in the cube where the periodicity added an additional layer of complexity
- Used optimisation strategies such as vectorisation and array broadcasting to reduce nested loops and if checks

Lunar Lander | *Python, Matplotlib*   2022
- Created a lunar lander game in Python using object-oriented programming to control rocket parameters
- Used Matplotlib in combination with loops to produce a GUI that updates via loops to produce visuals
- User tries to land in a specific speed range using thrusters to accelerate and decelerate the rocket

EXPERIENCE

Teaching Assistant/Tutor   2020 – Present
Ruislip High School/Private
- Aided teachers at Ruislip High School by tutoring students seeking to achieve their goals in A level exams
- Tutored students privately through various websites, delivering personalised lessons to help students drastically improve grades by one or two points above current results

PROGRAMMING SKILLS

Languages: Python, HTML/CSS, JavaScript
Frameworks: React, Node.js
Developer Tools: Version Control (Git, GitHub), VS Code