

Hifzur Rahman

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EDUCATION

University Of Cambridge, Cambridge, United Kingdom
BA Computer Science

Enrolled: October 2023 — Expected: June 2026

Newham Collegiate Sixthform, London, United Kingdom
3A*, Mathematics, Further Mathematics, Physics
Distinction in AEA Mathematics

Enrolled: October 2021 — June 2023

Little Ilford School, London, United Kingdom
10 grade 9's

Enrolled: September 2016 — June 2021

EXPERIENCE

University College London
Research Intern

London, United Kingdom
November 2021 - May 2022 Year

- Modelled electrons and laser beams of different polarisations mathematically - simulated the impact of these laser beams on Argon atoms - using Python.
- Plotted and analysed close to a million data points collected during a simulation, using Numpy and Matplotlib, making predictions about the relationship between laser parameters and the energy of photons emitted during high harmonic generation. These observations contributed towards a Doctoral Thesis (Chapter 8)
- Presented findings at two conferences, in front of academics at UCL.

University College London
Insight Day

London, United Kingdom
July 2022

- Shadowed post-doc machine learning researchers at UCL and learnt about the methods used to track and predict neurodegeneration.
- Learnt about the different techniques used to model and analyse transitions between stages of neurodegeneration

The Learning Hub
Tutor

London, United Kingdom
September 2021 — 23

- Tutored students in groups of five, in all core subjects up to GCSE level
- Learnt to communicate ideas effectively to students at varying levels of complexity

PROJECTS

Astropi Competition

November 2021

- Worked in a group to design and implement a Python program which used Numpy as well as live data from a Raspberry Pi aboard the ISS to verify Newtons Law of Gravitation.

Samsung Solve for Tomorrow

May 2022

- Worked in a group to design an app which would help students maximise their studying efficiency by suggesting topics to study based on how difficult they currently find each topic.
- Designed a rudimentary algorithm, in Python, which used a Markov model and transition matrix to choose how difficult the next topic should be, given the difficulty of the current topic.

Particle Simulation

June 2022

- Programmed a particle simulation which included gravity and collisions as well as the conservation and transfer of momentum when particles collide. Utilised the Python libraries Numpy and PyGame.
- Learned to implement mathematical models practically, using numerical methods such as Euler's methods for approximating derivatives.

Economic Market Simulation

June 2022

- Used Python to simulate a basic economic market, where buyers and sellers trade a single good. Plotted and analysed the different wealth levels of agents using indicators such as the Gini coefficient, Lorenz curve, Palma coefficient and Thiel index.

Weather App

April 2024

- Participated in a group to create a weather app for mountain sport enthusiasts using React Native and TypeScript.
- Presented the app to the rest of the cohort

Economics Tutor Bot

July 2023

- Developed a web-app to help students understand economics, including live graphs for key economic metrics, using Chart.js. Used Langchain and the OpenAI API to fine-tune a GPT model to explain the graph and answer any Economics related questions.

Background Sounds Web-app

July 2024

- Used React to develop a web-app allowing users to play background sounds while they relax, study or work.
- Developed the back-end using Express, as well as DynamoDB to store user playlists, and S3 buckets to store audio files.

SKILLS

- **Relevant Coursework:** Foundations of Computer Science, Digital Electronics, Databases, Object Oriented Programming, Discrete Mathematics, Computer Graphics, Machine Learning, Algorithms and Data Structures, Operating Systems, - University of Cambridge
- **Programming:** Python, Java, JavaScript, TypeScript, OCaml, SQL, Pandas, Numpy, Pytorch
- **Communication:** Writing / Presenting information