Samuel Overington

s.c.overington@gmail.com
samueloverington.com
github.com/oh-

Apple

```
1 Infinite Loop
Cupertino
CA 95014, US
```

I am a second year undergraduate student in Theoretical Physics at Queen Mary, University of London, with a passion for creativity, science and software engineering. I have a diverse history of experience with a background in art, where I have been an exhibiting artist working collaboratively with dancers exploring the relationship between drawing, motion and dance. I have also been a freelance web developer, leading creative front-end web development projects, graphic design, and most recently a software engineering intern.

2018 Software engineering internship.

During the 2018 summer break, I undertook a Python software engineering internship with Yobota; a mid-sized fintech startup in London, who have created a lean cloud based banking platform. I was delegated to the API / integrations team and given the exploratory project of creating an internal client for payment initiations using the UK's new banking initiative the OpenBanking API. The client that I wrote had to conform to banking industry standards, and employed technologies such as OAuth bearer tokens, a REST API for internal platform use, test driven development life cycle, continuous integration using Jenkins and written using Python / Django / DRF, with testing suite pytest.

As part of team building, I gave a company presentation on my research into OpenBanking. And for project planning, I took part in a daily morning standup, and weekly sprint planning meetings, where I set my own goals, and recounted updates on the progress of my integration.

Research projects and education.

Throughout my degree, I have been learning techniques in mathematics, programming, and physical laws to interrogate, model and analyse data from physical systems.

During the module *Introduction to Scientific Computing*, we were taught how to model many mathematical functions and analyse datasets; extracting relevant physical information from them. Of note, we learned about linear regression algorithms and curve fitting and image manipulation and cleaning using discrete Fourier transform; which drew upon my mathematical knowledge of linear algebra, and calculus.

As my final project for scientific computing, I researched and wrote a scientific report analysing gravitational waves and black hole mergers, which included an analysis of the first confirmed merger, detection GW151226. I used the public data-set from the LIGO interferometers, which measure stellar mass black-hole mergers, and I used python, numpy and scipy, in a Jupyter notebook to analyse the data. I used Fourier transforms to clean the signals, and a linear regression to fit Einsteinian prediction about the merger, for example: the mass of each of the two black holes, and producing a 'chirp mass' graph for that particular event.

In first year, I took part in a collaborative group project using Python and MatPlotLib to investigate financial data sourced from the World Bank, collating multiple years of financial information about specific and grouped countries, then analysing and normalising for inflation the results to plot using MatPlotLib's PyPlot, the movement of variables throughout a set time period in specific and grouped countries.

Freelance web development experience.

Before commencing my undergraduate study at Queen Mary, I worked as a freelance web developer, where I used my creative background to design and build custom website themes and plugins, gaining experience in PHP, JavaScript, HTML, CSS. This lead to working as the lead developer for *Stillnessinyoga*, a dutch yoga and meditation studio, where I built their digital product which has become an industry leading online learning space to accompany their teacher trainings for students to become certified yoga and meditation teachers.

I built the online membership e-commerce platform, along with designing the interactive digital teacher training manuals. I integrated a media streaming platform to host secure video content, integrating Amazon S3 buckets.

Interests

Developing simulations for AI development interests me on multiple levels, starting with its inherent ability to push the boundary of simulating physical systems, where I am able to programmatically define the rules of interactive worlds.

I am interested in game development engines as a framework to be able to push machine learning, deep neural networks and AI - as has been recently seen for example for the DeepMind's AlphaGo, and more recent AlphaStar.

How data-heavy research is carried out in academic and industrial settings is presently being revolutionised using such simulations, where deep learning techniques such as *convolutional neural networks* are revolutionising machine learning algorithms; generalising the way in which a wide variety of signal inputs are able to be comprehended.

My software engineering, freelance, and creative experiences, and training in art and science has given me a unique edge in solving problems needed to work in machine learning and AI. I believe that I would bring out-of-the-box insights, making me an ideal candidate for a team undertaking such research.