Sophie **Martin**

PhD Student · University College London

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Research Interests

I am a PhD student on the i4Health CDT at University College London with an interest in healthcare applications of artificial intelligence. My research focus is on explainable methods and interpretable deep learning in medical imaging. I'm also excited by the use of AI for personalised treatment and enjoy discussions about model bias, fairness and ethics.

Education

University College London	*London*
PhD in AI & Medical Imaging (1+3, ESPRC-funded)	*2020 - Present*

Imperial College London	*London*
Upper Second Class (Hons) MSci Physics	*2016 - 2020*

St Angela's Ursuline School	*London*
A Level: 3A*'s (Maths, Further Maths, Physics) & 1A (History)	*2014 - 2016*
GCSE: 9A*s (inc. Maths and English Language) & 2As + FMSQ	*2009 - 2014*

Research Projects

Evaluating Explanation Methods in Deep Learning for Stroke Classification *University College London*

MRes Research Project *Oct 2020 - May 2021*

- This project evaluated several state-of-the-art explanation methods to probe a neural network trained to classify stroke patients from healthy controls. It was supervised by Dr James Cole and Professor Frederik Barkhof during the MRes part of my PhD.

A Network Science Perspective on Signal Propagation in the Brain *Imperial College London*

MSci Research Project *Oct 2019 - May 2020*

- Supervised by Professor Kim Christensen, I developed a cellular graph network to model excitation spread across structures such as small-world, stochastic model and Barabasi-Albert hub network. This made use of graph theory and criticality analysis.

Sensitivity Studies of the 5 MeV Distortion at SoLid Utilising Machine Learning *Imperial College London*

BSc Research Project *Oct 2018 - May 2019*

- Supervised by Dr Daniel Saunders, this project evaluated the use machine learning to detect a distortion in the anti-electron neutrino energy spectrum. This signal vs. background problem is highly transferable and was a useful application of statistical data analysis.

Industry Experience

Illumina *Cambridge*

Bioinformatician *Jul 2019 - Oct 2019*

- I used Python to build a pipeline that used machine learning to identify tumour-only variants from genetic data.
- Explored feature visualisation/engineering methods and hyperparameter optimisation to improve performance.
- I used the Sun Grid Engine cluster computing framework to submit jobs for batch processing.

Open Energi *London*

Data Scientist, Internship *Jul 2018 - Sep 2018*

- I contributed to a project to improve asset performance for rapid grid frequency response.
- Code was developed in Python, Git was used to collaborate with other developers and SQL was required to interact with the database.
- I was able to highlight opportunities for business development and presented my findings to the company.

Teaching Experience

Introduction to Deep Learning *Department of Computer Science*

Postgraduate Teaching Assistant (PGTA) *Oct 2021 - Jan 2022*

- I assisted with teaching and marking during this course and delivered a guest lecture on *Model Interpretation*.

Awards & Publications

AWARDS

2022	**2nd Place**, NeuroHACK Hackathon, DEMON Network	*Virtual Event*
2021	**Finalist**, 15th Annual London Hopper Colloquium	*Virtual Event*
2016	**Winner**, Worshipful Company of Coachmakers and Coach Harness Makers' Jaguar Land Rover Bursary	*London*

PUBLICATIONS

2021	**Conference Paper**, Liam F. Chalcroft, Jiongqi Qu, **Sophie A. Martin**, Iani JMB Gayo, Giulio V. Minore, Imraj RD Singh, Shaheer U. Saeed, Qianye Yang, Zachary M. C. Baum, Andre Altmann, Yipeng Hu, *Development and evaluation of intraoperative ultrasound segmentation with negative image frames and multiple observer labels.*	*ASMUS, MICCAI*

Other Activities

The Blackett Lab Family C.I.C   *London*

DIRECTOR OF MEDIA & MARKETING   *Jun 2020 - Present*

- I generate social media content, lead website development, and manage communications for the organisation.

Project Partners Education   *London*

BOARD TRUSTEE   *Mar 2020 - Present*

- I help facilitate the growth this educational charity by attending meetings and consulting on teaching materials.

Google GetAhead Program   *Virtual Event*

PARTICIPANT   *Jul 2021 - Sep 2021*

- I participated in a 6-week virtual program for selected CS students across EMEA. The program involved technical challenges, YouTube live trainings and interview workshops.

Skills

Programming	Python, MatLab, Bash, SQL, Git, LaTeX, Cluster Computing
Web	HTML5, CSS, Bootstrap 4, Javascript
General	UK Driving License, English (Native), French (B1)