

# Edward Phillips

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I am a DPhil candidate at the University of Oxford, researching Clinical AI ('AI for Healthcare') in the Computational Health Informatics Lab. I previously spent three years in industry as a data scientist and systems engineer, working in generative AI, medical device development, and biomarker research. I hold a Master's Degree in Information and Computer Engineering from the University of Cambridge, achieving First Class with Distinction. I have 8+ years of Python experience, with expertise in Computer Vision and NLP. I have been described by others as a high performer with the ability to build effective relationships across disciplines.

## University Education

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### University of Oxford, Computational Health Informatics Lab

Oxford, UK

*DPhil, Engineering Science - Supervisor: Professor David Clifton*

*October 2024 - Present*

- The aims of the lab are to make fundamental contributions to the theory of AI in medicine while also working with collaborators to produce systems that help patients.
- I am currently working on several projects developing AI systems to improve clinical decision making. This includes foundational models for electronic health record (EHR) data, large multimodal models for oncology, and probabilistic methods for medical risk prediction.
- I am leading a research project in uncertainty propagation in large language models as part of the Oxford Artificial Intelligence Society. I am also working with groups in the Pandemic Sciences Institute to develop generative AI and NLP analysis tools for infectious disease researchers.

### University of Cambridge

Cambridge, UK

*MEng Information and Computer Engineering*

*September 2016 - June 2020*

- I achieved a First in every year of examinations, and was awarded a senior scholarship each year for academic achievement. In my second year I was awarded the Bill Ray Prize for special aptitude in electrical subjects.
- I was awarded a distinction for my Master's project in computational neuroscience, in which I used TensorFlow to train biologically-interpretable models which could replicate the input-output mapping of real neurons.
- I specialised in Information and Computer Engineering. Particular areas of focus were deep learning, statistical signal analysis, and mathematical methods. The specific modules I studied included software design, deep learning and structured data, computer vision, advanced control theory, medical imaging, molecular biology, and neuroscience.
- As well as my specialist areas, I studied a wide range of engineering disciplines including mechanics, structures, fluid dynamics, electronics, electrical engineering, and mathematics. Outside of engineering, I took modules in economics and risk modelling.

## Employment History

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### Norstella - pharmaceutical solutions

London, UK

*Data Scientist*

*November 2023 - September 2024*

- I developed GenAI-based applications for customers across the pharmaceutical industry. For instance, I built a retrieval-augmented generation (RAG) framework to allow customers to interrogate Norstella's forecasting and market analysis datasets.
- The framework used state-of-the-art developments in query-rewriting, knowledge retrieval, and prompting techniques to deliver relevant and reliable information to users. I applied widely accepted LLM evaluation metrics to monitor the performance of the applications using popular frameworks such as Langchain.
- I used the suite of tools in the AWS ecosystem to develop, deploy and manage data science services. I am familiar with AWS cloud services, REST/Websocket APIs, Docker and terraform, among other tools.
- I integrated new predictive models into Norstella's suite of financial forecasting products, using interpretable machine learning approaches and deployment and management tools such as Apache Airflow and Kubernetes.

## Owlstone Medical - medtech scale-up developing a breathalyzer for disease

Cambridge, UK

Data Scientist

June 2022 - April 2023

### Project 1: Regression models for gas concentration prediction

- The project aim was to develop a handheld device to predict on-breath hydrogen and methane concentrations, which aid in the diagnosis of digestive disease.
- I built and managed data processing pipelines and packages required to interpret high volumes of sensor data, and trained time-series machine learning models for gas concentration prediction.
- *The models achieved a prediction error of less than 5ppm, a necessary performance level to inform diagnoses of SIBO and other digestive diseases.*

### Project 2: A digital pathology pipeline to identify biomarkers for diagnostic tests

- The project aim was to find a rapid and cost-effective solution to assess the level of protein expression in tissue sections, as captured by high-resolution microscope images.
- I created a processing and analysis pipeline for the images, which used a combination of open-source digital pathology software, Python and batch scripts to generate relevant metrics to indicate the level of protein expression.
- *I built the pipeline at less than 20% of the cost of popular subscription-based digital pathology solutions or manual human pathologist review. Using the pipeline, I delivered the analysis results for IHC image batches in less than one day, compared to multiple weeks required for a manual review.*

### Project 3: Transformer models and GNNs to predict affinity between enzymes and substrates

- The project aim was to predict the affinity between biomarkers of interest and potential compounds with which they could interact. I used transformer protein language models and graph neural networks to predict a popular metric used to quantify this affinity, which is complex to measure directly.

## Owlstone Medical

Cambridge, UK

Systems Engineer

April 2021 - June 2022

- I led the engineering work to design, develop, and fully test a mouse breath sampling device for use in biomarker discovery. I wrote a Python-based GUI for user interaction, I developed a dynamic control system to regulate air flows, and managed a multi-device electronics configuration.
- *I delivered a prototype system on-time for use in an animal study. I conducted a solo overseas trip to the study site to upgrade and test the system in preparation for a second study following positive results in the first.*

## Organox - organ preservation for transplantation

Oxford, UK

Engineering Intern

July - August 2018

- I conducted a research project to tackle challenges in scaling down the company's organ-preserving perfusion device to work for small organs such as kidneys. I developed a test circuit and wrote control firmware in C to deliver controlled oxygen flow rates in an energy-efficient manner.
- *Using a form of oxygen storage I was able to achieve an 85% reduction in energy consumption, and demonstrated how further savings could be achieved. Organox continued to develop a kidney perfusion device which was in human clinical trials as of 2023.*

## Livingbridge Private Equity

London, UK

Junior Analyst

July - September 2017

- I designed and created a relational database to store sensitive company data, and wrote SQL queries to facilitate access for other team members. I wrote code in Excel VBA to cut time required for routine data processing tasks from days to minutes.

## Skills

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**Programming Languages/Tools:** Python, SQL, AWS, Azure, Git

**Libraries:** PyTorch, TensorFlow, Transformers, Numpy, pandas, scikit-learn

**Languages:** English (native), French (intermediate), Spanish (intermediate)

## Interests

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In my spare time I enjoy playing football, running and learning languages. In 2023 I took a career break to travel around Latin America.

References available upon request