Edward Phillips

✉ edward.phillips@eng.ox.ac.uk　　•　　🌐 ed-phillips.github.io　　•　　○ ed-phillips

I am a DPhil candidate in Engineering Science at the University of Oxford, researching 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 9+ years of Python experience, with expertise in deep learning across language, images and other modalities. I have been described by others as a high performer with the ability to build effective relationships across disciplines.

University Education

University of Oxford, Computational Health Informatics Lab　　　　　　　　　　　　**Oxford, UK**
DPhil, Engineering Science, supervised by 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.
- My research is centered around the development of AI tools to support clinical decision-making, with an emphasis on explainable and uncertainty-propagating methods.
- In the language domain, I have published methods to quantify uncertainty in large language models, with applications in hallucination detection. I have also recently created an agent-based framework for treatment planning in oncology, with an upcoming pilot evaluation in collaboration with NHS and industry partners.
- I am currently developing novel foundation models for electronic health record data, which I aim to employ for actionable risk prediction in primary care settings.

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, computer vision, advanced control theory, medical imaging, molecular biology, and neuroscience.
- As well as my specialist areas, I studied a wide range of disciplines including mechanics, structures, fluid dynamics, electronics, electrical engineering, mathematics, economics and risk modelling.

Employment History

Norstella - pharmaceutical solutions　　　　　　　　　　　　　　　　　　**London, UK**
Data Scientist　　　　　　　　　　　　　　　　　　　*November 2023 -September 2024*

- I developed GenAI-based applications for customers across the pharmaceutical industry, including a retrieval-augmented generation framework to facilitate interrogation of 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*
- I worked across multiple projects applying machine learning and data science to support R&D.
- I trained time-series regression models to predict concentrations of on-breath gases using sensor data, enabling diagnosis of digestive diseases via a handheld device.
- I created a cost-efficient digital pathology pipeline to quantify protein expression in high-resolution tissue images, delivering same-day results at less than 20% of the cost of commercial alternatives. The pipeline identified promising candidate biomarkers relating to in early identification of cancers.
- I applied transformer-based protein foundation models and graph neural networks to predict enzyme–substrate affinities, which accelerated selection of suitable compounds for use in Owlstone's diagnostics platform.

Owlstone Medical   **Cambridge, UK**
Systems Engineer   *April 2021 - June 2022*
- I led the engineering work to design, develop, and 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, which was used to derisk the company's flagship method for breath-based detection of lung cancer.*

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 with a successful human clinical trial completed in 2024.*

Livingbridge Private Equity   **London, UK**
Junior Analyst   *July - September 2017*
- I created relational databases for sensitive company data, and wrote SQL and Excel VBA for analytics tasks.

Publications

Geometric Uncertainty for Detecting and Correcting Hallucinations in LLMs
E. Phillips, S. Wu, S. Molaei, D. Belgrave, A. Thakur, D. Clifton. https://arxiv.org/abs/2509.13813

Foundation Models for Biosignals: A Survey
X. Gu, Y. Shu, J. Han, Y. Liu, Z. Liu, J. Anibal, V. Sangha, **E. Phillips**, B. Segal, Y. Liu, H. Yuan, F. Liu, K. Branson, P. Schwab, D. Belgrave, L. Clifton, D. Spathis, V. Lampos, A. A. Faisal, D. A. Clifton. https://www.techrxiv.org/doi/full/10.36227/techrxiv.175606236.62808131

Skills

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

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

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

Teaching

University of Oxford, Undergraduate Tutorials   **Oxford, UK**
Machine Learning, Software Engineering   *2025 - Present*
- I teach two courses to third-year Engineering Science undergraduates. The machine learning course covers topics including graphical models, approximate inference, and neural networks. The software engineering course covers C++ design principles and algorithmic development.