

The Alan Turing Institute

Research Associate (Machine Learning) - Turing-Sanger Partnership

THE ALAN TURING INSTITUTE

There has never been a more significant time to work in data science and AI. There is recognition of the importance of these technologies to our economic and social future: the so-called fourth industrial revolution. The technical challenge of keeping our data secure and private has grown in its urgency and importance. At the same time, voices from academia, industry, and government are coming together to debate how these technologies should be governed and managed. The Alan Turing Institute, as the UK's national institute for data science and artificial intelligence, plays an important part in driving forward advances in these technologies in order to change the world for the better.

The Institute is named in honour of Alan Turing, whose pioneering work in theoretical and applied mathematics, engineering and computing is considered to have laid the foundations for modern-day data science and artificial intelligence. The Institute's purpose is to make great leaps in data science and AI research to change the world for the better. Its goals are to advance world-class research and apply it to national and global challenges, build skills for the future by contributing to training people across sectors and career stages, and drive an informed public conversation by providing balanced and evidence-based views on data science and AI.

After launching in 2015 with government funding from EPSRC and five founding universities, the Institute has grown an extensive network of university partners from across the UK and launched a number of major partnerships with industry, public and third sector. Today it is home to more than 500 researchers, a rapidly growing team of in-house research software engineers and data scientists and a business team.

BACKGROUND

The Alan Turing Institute and the Wellcome Sanger Institute are world-leading scientific institutions, with complementary skills in machine learning techniques and using genomic data to answer scientific questions. Under a new partnership, both institutes are embarking on a collaborative research project with the aim of advancing our understanding of cellular processes and interactions.

This project will combine two important fields of study: machine learning and spatial / single-cell transcriptomics. The goal is to leverage investments in observing biological systems at cellular resolution (such as the Human Cell Atlas (HCA) data) to develop state-of-the-art generative machine learning (ML) tools that can model cellular behaviours across various modalities and scales. You will work within an interdisciplinary team of life and computer/machine learning scientists, with a shared goal of improving our understanding of the rules of life and using this to improve health for all.

You will be joining the Health and Medical Sciences Programme at the Turing which delivers research into the theory and methods of AI, statistics, and data analytics underpinning medical and health applications that will enable scientists to do better science, without compromising respect for privacy and patient trust.

ROLE PURPOSE

The partnership is now recruiting a Research Associate with a research background in machine learning. You will be expected to work on specific machine learning projects at the intersection of single-cell biology, spatial 'omics and machine learning. Your work will contribute to the overall aims of this collaboration, which are to address two fundamental yet significant questions:

"Can we predict cellular responses to perturbations (e.g., drugs, genetic perturbations)?" and, "Can we predict molecular information (e.g., gene expression) at a cellular resolution from within a tissue given the histology image?" To achieve this, you will work with open-source software, proposing, developing, and maintaining new solutions to analyse and interpret large-scale single-cell datasets.

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Our teams are well-positioned to tackle this problem with experience in both generating and analysing datasets, including millions of cells across multiple tissues and conditions (e.g., disease, healthy), a detailed understanding in the training of large-scale ML models and a track record of undertaking large data-science projects.

The successful candidate will be part of a cross-institute team focused on delivering novel A.I. and data science solutions to biological problems. The machine-learning function within this team will provide the expertise and experience required to successfully design, implement and deploy cutting-edge AI and machine-learning tools. As a result, the successful candidate will be required to develop tailored AI models that can be trained and deployed on biological data.

This is a stand-out opportunity to join a prestigious, national research institute and shape its agenda at an important and exciting time in its development, by being part of an exciting new partnership with the Wellcome Sanger Institute.

DUTIES AND AREAS OF RESPONSIBILITY

- Propose, develop, and evaluate new ML models that enable understanding of single-cell data and its application in cell engineering and medicine.
- Collaborate with graduate students, postdocs, research software engineers and data wranglers on developing solutions for interdisciplinary scientific problems in biology.
- Collaborate in writing scientific papers towards high-impact journals in biotechnology and biology.
- Distil solutions into open-source and easy-to-install packages, including usage documentation for downstream users such as biologists and bioinformaticians.
- Communicate research outputs to diverse stakeholders, through conferences, events, meetings, and press opportunities as appropriate.
- Hold regular meetings with partnership members, and travel as necessary, to present work and meet with external collaborators.
- Cultivate strong relationships with internal stakeholders, liaising with the Turing's Programme Management team, Business team, Public Policy team and associated delivery partners across the Institute and its wider network, including the Wellcome Sanger Institute.
- Adhere to and promote principles of reproducible and ethical data science and ensure compliance with secure handling of data and health and safety in all aspects of work.
- To undertake high-quality independent research, contribute to the broader research aims and challenges of the Turing Health and Medical Sciences programme and ensure positive feedback to the project partnership.
- Represent the partnership at relevant external conferences and events and contribute to the public communication strategy around the partnership.

OTHER DUTIES

- Teaching may be required as part of collaboration work.

Please note that job descriptions cannot be exhaustive, and the postholder may be required to undertake other duties, which are broadly in line with the above key responsibilities. This job description is written at a specific time and is subject to changes as the demands of the Institute and the role develop.

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PERSON SPECIFICATION		
Skills and Requirements	Essential (E) Desirable (D)	Tested at application (a) Tested at interview (i)
Post holders will be expected to demonstrate the following:		
Education/Qualification		
A PhD (or equivalent experience and/or qualifications) in a relevant area which will include either a computational focus like Statistics, Mathematics, Computer Science, Information Engineering, etc. or a biomedical modelling focus like Bioinformatics, Computational Biology, Biomedical Engineering, etc. or similar inter-disciplinary subjects.	E	A/I
Research Assistant level: <u>must</u> be near completion of PhD in a relevant area which will include either a computational focus like Statistics, Mathematics, Computer Science, Information Engineering, etc. or a biomedical modelling focus like Bioinformatics, Computational Biology, Biomedical Engineering, etc. or similar inter-disciplinary subjects.	E	A/I
Knowledge and Experience		
Substantial experience in statistical modelling and/or data analytics on significant real-world problems, including experience in learning from data from multiple sources and types	E	A/I
Experience using advanced statistical, machine, and modern deep learning techniques	E	A/I
Substantial experience of using modern statistical programming languages (such as R and Python)	E	A/I
Strong knowledge of core data science libraries such as Scikit-Learn, SciPy, TensorFlow, and PyTorch	E	A/I
Ability to understand and apply the principles of reproducible data science	E	A/I
Knowledge of software development best practices and collaboration tools, including git-based version control, python package management, and code reviews	E	A/I
Experience and knowledge of either genomics and/or imaging data	D	A/I
Experience in working with modern omics or imaging analysis pipelines	D	A/I
Experience working with cloud environments and tools, such as Amazon AWS S3, EC2	D	A/I
Experience of developing and documenting analysis workflows for scientific research projects	E	A/I
Ability to perform relevant literature reviews	E	A/I
Ability to critically evaluate experimental results and derive evidence-driven conclusions	E	A/I
Experience of publishing their research through peer-reviewed scientific articles	E	A/I

The Alan Turing Institute

Communication		
Excellent written and verbal communication skills including the ability to present complex or technical information, and to communicate effectively with analysts and other stakeholders outside the research community	E	A/I
Ability to adapt the style of communication to the audience and ensures understanding	E	A/I
Liaison and Networking		
Ability to collaborate successfully with colleagues in a multidisciplinary environment within the organisation or externally to share knowledge and information in order to develop practice or help others learn	E	A/I
Ability to represent the partnership at practitioner events and high-level meetings	E	A/I
Ability to establish academic collaborations nationally and internationally	E	A/I
Project Management and Project Delivery		
Ability to keep accurate and up to date knowledge of services available in own and related areas of work	E	I
Ability to work across the partnership to contribute and assist in diverse research activities	E	A/I
Ability to develop and lead collaborative research and innovation	E	A/I
Decision Making		
Ability to work with others to make collaborative decisions	E	A/I
Initiative and Problem Solving		
Ability to use own judgement to analyse and solve problems	E	A/I
Ability to consider possible solutions and identify with evidence those which offer widest benefits.	E	A/I
Ability to lead one's own work, including planning and execution, and to prioritise work to meet deadlines	E	A/I
Analysis and Research		
Ability to organise working time, take the initiative, and carry out research independently under the guidance of the PIs	E	A/I
Teaching and Learning		
Teaching may be required as part of the role	E	A/I
Other Requirements		
Commitment to EDI principles and to the Organisation values	E	I
Ability to travel between the Turing office in London and the Wellcome Sanger Institute in Cambridge, in accordance with project requirements	E	I

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OUR VALUES

The Alan Turing Institute is committed to equality diversity and inclusion and to eliminating discrimination. All employees are expected to embrace, follow and promote our [EDI Principles](#) and Our Values.

Our values



Trust

We create an environment where we have trust and can be trusted



Inclusivity

We expect our Turing community to contribute to a culture that is inclusive and free of barriers



Respect

We all have different roles, priorities and challenges but our shared purpose is the same



Leadership

Leadership is everyone's business; Turing leaders set the right tone and lead by example



Transparency

Everyone should understand the how and the why of our decisions and actions



Integrity

We are all ambassadors for the Turing's mission of changing the world for the better

APPLICATION PROCEDURE

If you are interested in this opportunity, please click the apply button below. You will need to register on the applicant portal and complete the application form including your CV and covering letter. If you have questions about the role or would like to apply using a different format, please contact us on 020 3862 3536 or email recruitment@turing.ac.uk.

We reserve the right to close this vacancy early or to interview suitable candidates before the closing date if enough applications are received.

Interviews will take place from mid-January 2024.

CLOSING DATE FOR APPLICATIONS: 31 December 2023 at 23:59 (London UK GMT)

TERMS AND CONDITIONS

This full-time post is offered on a fixed term basis for 3 years.

If appointed as Research Associate, the annual salary range would be £42,893 to £48,510 depending on experience.

Candidates who have not yet been officially awarded their PhD will be appointed as Research Assistant at a salary of £40,148 per annum.

In addition to the annual salary we offer excellent benefits, including flexible working and family friendly policies, <https://www.turing.ac.uk/work-turing/why-work-turing/employee-benefits>.

EQUALITY, DIVERSITY AND INCLUSION

The Alan Turing Institute is committed to creating an environment where diversity is valued and everyone is treated fairly. In accordance with the Equality Act, we welcome applications from anyone who meets the specific criteria of the post regardless of age, disability, ethnicity, gender reassignment, marital or civil partnership status, pregnancy and maternity, religion or belief, sex and sexual orientation.

We are committed to building a diverse community and would like our leadership team to reflect this. We therefore welcome applications from the broadest spectrum of backgrounds.

We are committed to making sure our recruitment process is accessible and inclusive. This includes making reasonable adjustments for candidates who have a disability or long-term condition. Please contact us at adjustments@turing.ac.uk to find out how we can assist you.

Please note all offers of employment are subject to obtaining and retaining the right to work in the UK and satisfactory pre-employment security screening which includes a DBS Check.

Full details on the pre-employment screening process can be requested from HR@turing.ac.uk.