

The Alan Turing Institute

Research Associate in Probabilistic Machine Learning (x2)

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 goals are to undertake world-class research, apply its research to real-world problems, driving economic impact and societal good, lead the training of a new generation of scientists, and shape the public conversation around data and algorithms.

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

Building on NATS and Turing strategic partnership, the collaboration is now embarking on a £13.7M, 5 year EPSRC Prosperity Partnership Programme, entitled BlueBird. Alongside NATS and Turing, the research programme includes partner universities of Exeter and Cambridge. The research programme is led by Professor Tim Dodwell (Turing AI Fellow at Turing & University of Exeter), Dr Evelina Gabasova (Turing Principal Research Data Scientist), Prof Mark Girolami (Turing Programme Director for Data Centric Engineering programme), Prof Richard Everson (Professor of Machine Learning at University of Exeter and Turing Fellow), Dr Edmond Awad (Assistant Professor at University of Exeter), Dr Adrian Weller (Turing Programme Director for the AI programme), and our partners at NATS including Dr Richard Cannon (Research Lead) and their wider research team.

The ambition of the partnership between NATS and The Alan Turing Institute is to develop the fundamental science to deliver the world's first AI system to control a section of airspace in live trials.

The EPSRC programme, which started in July 2021, is recruiting six post doctoral researcher positions to be based at Exeter and Turing, across three themes which include (1) Digital Twin of UK Airspace (2) Multi-Agent Machine Learning Control of Air Traffic (3) Safe and Trustworthy Air Traffic Control. Links to all the roles available can be found on the project website: <https://www.turing.ac.uk/research/research-projects/project-bluebird-ai-system-air-traffic-control>

ROLE PURPOSE

We are recruiting two 3-year post-doctoral researchers (PDRAs) to develop the Digital Twin of UK Airspace in the programme. These are collaborative research positions, consisting of three PDRA positions and three software engineers - based at Turing, Cambridge and Exeter. The aim of the theme is to build a data-driven simulator for all aircraft movements in UK airspace, from a data set of 20 million flight records over a 15 year period. This simulator will provide the modelling engine for the development for machine learning control algorithms developed in the wider programme.

The core scientific work will develop new probabilistic forecasting methods in high dimensional system, multi agent systems. This research will deliver new transformative methods not only in air traffic management, but in the broader scientific applications.

The successful applicants will work within this team, which will be led and supervised by world leading scientists at the Turing: Professor Tim Dodwell (Turing AI Fellow at Turing & University of Exeter) and Professor Mark Girolami (Cambridge & Turing).

We welcome applications from a broad range of background include computer science, mathematics, statistics and engineering; with knowledge of statistical modelling, deep learning, optimisation, uncertainty quantification, physical based simulation and high performance computing.

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For this theme, there are three Post-doctoral positions available, two to be based at Turing and one at Exeter. If you are interested in these roles in general, we ask you to submit (the same) application to each position. Shortlisting and interviews will be carried out by identical panels.

DUTIES AND AREAS OF RESPONSIBILITY

- Develop, implement and test novel data driven / physic informed digital twin for UK airspace.
- Develop novel scientific methods in probabilistic forecasting, data assimilation and / or parallel computation.
- Demonstrate a commitment to open innovation and reproducible research – exemplified by the Turing Way.
- Contribute to knowledge transfer activities with NATS as partnership organisation.
- Work closely in a large distributed team.
- Regularly present findings to industrial partners and scientific communities, through presentation at leading conferences and high impact journals.

Please note that job descriptions cannot be exhaustive, and the post-holder 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		
	Essential (E)	Tested at application(a)
Skills and Requirements	Desirable (D)	Tested at interview (i)
Post holders will be expected to demonstrate the following		
Education/Qualification		
PhD or equivalent industry experience in appropriate analytical subject include Mathematics, Computer Science or Engineering.	E	A
Research Assistant level: close to completing PhD in appropriate analytical subject include Mathematics, Computer Science or Engineering.	E	A
Knowledge and Experience		
Track Record in Probabilistic Machine Learning, Bayesian Statistics / Big Data	E	A
Track Record in Software Development	E	I
Experience in high performance computing	D	I
Communication		
Excellent written communication skills, including the ability to write for publications, present research proposals and results, and represent the research group at meetings.	E	A I
Good effective communication (oral and written) and the ability to adapt the style of communication to the audience and ensures understanding.	E	A I
Project Management & Project Delivery		
Proactive approach to managing stakeholders and their requirements and identifying opportunities for collaboration	E	I
Adapts services and systems to meet stakeholders' needs and identifies ways of improving standards.	E	I
Decision Making		
Ability to lead own work independently, and to work with others to make collaborative decisions that may be operational or strategic and impact immediate team or work area.	E	I
Initiative and Problem Solving		
Ability to organise and prioritise own work with minimal supervision	E	A I
The ability to initiate, plan, organise, implement and deliver programmes of work to tight deadlines.	E	I
Creative approach to problem solving	D	I

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Analysis and Research		
Ability to carry out original research and to produce published research papers.	E	A
A developing track record in producing high quality academic publications. Ability to write research reports and papers in styles accessible to both academic and lay audiences.	E	A I
Ability to identify, develop and apply new concepts, techniques and methods.	E	A I
Other Requirements		
Commitment to meeting deadlines	E	A I
Flexible attitude towards work	E	I
Commitment to EDI principles and to the Organisation values	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 [Rules of the Game](#)



Respect – We treat everyone with respect, dignity and kindness and acknowledge the experiences, skills and contributions of others.

Trust - We communicate openly and honestly to support an environment where we have trust in each other.

Transparency – We seek to ensure that everyone understands the how and the why of our decisions and actions. We take on board to feedback when those decisions are challenged.

Inclusivity – We are committed to continuously learning how to be more inclusive by listening to those facing barriers.

Leadership – We recognise creating an inclusive, diverse and equitable institute requires leadership from all. We stand up and speak out when change is needed.

Integrity – We recognise that how we work is as important as our outputs and seek to exemplify best practice in all our decisions.

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 3575 or 0203 862 3340, or email recruitment@turing.ac.uk.

CLOSING DATE FOR APPLICATIONS: Sunday 05 September 2021 at 23:59.

TERMS AND CONDITIONS

This full-time post is offered on a fixed term basis for 3 years. The annual salary is £37,000-£42,000 plus excellent benefits, including flexible working and family friendly policies, <https://www.turing.ac.uk/work-turing/why-work-turing/employee-benefits>

Candidates who have not yet been officially awarded their PhD will be appointed as Research Assistant at a salary of £34,500 per annum

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.

Reasonable adjustments to the interview process will be made for any candidates with a disability.

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.