The Alan Turing Institute

Senior Research Associate, Autonomous Systems for Biodiversity Monitoring

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

ENVIRONMENT AND SUSTAINABILITY GRAND CHALLENGE

The Alan Turing Institute's new strategy, Turing 2.0, was officially launched in March 2023 with a focus on three Grand Challenges which directly underpin and support the national priorities. One of these Grand Challenges is focused on Environment and Sustainability. This programme of research will develop UK leadership within the Environment and Sustainability community by developing, deploying, and delivering fundamental digital technologies to address the climate and biodiversity crisis and the need for greater sustainability.

The world is facing unprecedented environmental challenges and the need to address these issues has never been more pressing, Artificial Intelligence (AI) and Digital Twins present a unique and timely opportunity to address these challenges, providing new insights, delivering new tools and deploying new approaches that can help us mitigate and adapt to the impact of human activities on the environment. We are working closely with the community to develop missions building on previous work in environmental forecasting, the tracking of global resources, the automation of wildlife monitoring and designing net zero solutions for sustainable cities and regions.

The Alan Turing Institute is looking to recruit a Senior Research Associate to work with an interdisciplinary team to develop autonomous decision-making solutions for scientific research questions, under the open-source research project entitled "AI and Autonomous Systems for Biodiversity Monitoring". The project stems from the observation that global biodiversity decline is a critical issue facing humanity, and, in consequence, biodiversity monitoring is essential to understand the functioning of ecosystems, as well as impacts of human activities and climate change, and to develop policies to address this decline. The goal is to develop real-world exemplars of AI-driven Biodiversity Monitoring, selected to leverage existing efforts towards this direction and address outstanding technical challenges in key areas of autonomous marine monitoring and citizen science-led terrestrial monitoring.

ROLE PURPOSE

The Senior Research Associate will work closely with an interdisciplinary team of senior scientists, domain experts, and Research Associates at the Turing, as well as external collaborators.

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The candidate may be from a scientific or computer science background. Their role will be to develop algorithms for adaptive sampling in the context of autonomous monitoring missions via underwater vehicles (e.g. gliders). The candidate will work on the work package of the project "AI and Autonomous Systems for Biodiversity Monitoring", which focuses on equipping pilot-less AUVs with advanced information gathering capabilities to optimise the quantity/quality of the data collected, while satisfying safety and environmental constraints using newly developed algorithms (greedy approaches, AI planning, probabilistic reasoning, and reinforcement learning).

The postholder will play an active role in the technical meetings that will take place between the partner institutions, establishing a robust platform for developing future programmes between environmental science researchers, The Alan Turing Institute and the wider scientific community. This is a collaborative research role and so it is crucial that the candidate enjoys working with others and is responsive within an interdisciplinary research environment.

DUTIES AND AREAS OF RESPONSIBILITY

The selected candidate will be expected to work closely with the project leaders, and to:

- Undertake research on autonomous decision-making for adaptive sampling missions with underwater vehicles within the context of the project "AI and Autonomous Systems for Biodiversity Monitoring";

- Take a lead on writing up findings as they emerge, producing reports, and developing publications in peer reviewed journals, in collaboration with the research team;

- Provide technical project management and leadership for research projects, ensuring successful outcomes;

- Liaise with partners/funders and colleagues to understand and prioritise project goals, and balancing partners value with research outputs;

- Define the research direction in collaboration with the PI

- Develop software to implement decision-making algorithms for adaptive sampling;

- Run experiments as appropriate to demonstrate the performance of such algorithms;

- Work collaboratively with researchers, senior investigators from across the Turing and external partners on the project;

- Build upon open and accessible tools for the scientific research community;

- Manage and engage with open-source collaborative code on GitHub;

- Help create a friendly and approachable community of experts, datasets and engineers, and facilitate integration with Turing's research programmes;

- Present research findings and papers at academic and professional conferences, and contribute to the external visibility of the Institute;

- Be a point of contact, supporting PIs in engaging with stakeholders regarding projects and deputising in meetings where necessary.

- Supervise junior research team members

- Participate in the organisation of research workshops and other events.

OTHER DUTIES

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 Post holders will be expected to demonstrate the following:	**Essential (E)** **Desirable (D)**	**Tested at application (A)** **Tested at interview (I)**
Education/Qualification		
PhD degree or equivalent qualification/ experience in a field with significant elements of autonomous decision-making (e.g., AI planning, probabilistic reasoning) and/or machine learning (e.g., reinforcement learning).	E	A
Knowledge and Experience		
Significant experience in autonomous systems and autonomous decision making	E	I
Fluency in at least one programming language	E	A, I
Familiarity with one or more machine learning toolsets (*e.g.,* SciKit Learn, JAX, TensorFlow, PyTorch, etc.) or autonomous decision-making toolsets (e.g., PDDL planners)	E	A, I
Experience in managing, structuring, and analysing research data	E	I
Evidence of algorithm development for scientific research	E	I
Interest in methodological advances in biological sciences, environmental sciences or agricultural sciences	E	A
Explainable AI techniques	D	A
Experience leading a project to a successful conclusion	E	A
Experience in making or evaluating the case for new projects (e.g., authoring or evaluating research proposals or business cases)	E	A
Demonstrable experience managing conflict and resolving stakeholder tensions	D	A
Communication		
Ability to communicate complex, specialist or conceptual information clearly and persuasively to diverse audiences.	E	I
Evidence of high-quality first author publication(s) in a relevant field (published or in-press)	E	A, I
Project Delivery		
An understanding of the importance of good practice for producing reliable software and reproducible research (e.g. version control, literate analysis tools such as Jupyter)	E	I
Demonstrated ability to balance the pressures of research, administrative demands and competing deadlines to meet objectives.	E	I
Liaison and Networking		

Ability to work effectively across disciplinary boundaries, both as part of an interdisciplinary team and in close collaboration with external partners in different disciplines.	E	A
A proven ability to collaborate successfully in a multidisciplinary environment to meet project objectives.	E	A, I
Initiative and Problem Solving		
Ability to use judgement to analyse and solve problems and take action to prevent recurrence of problems and identify possible solutions with wider benefits	E	I
Ability to organise working time, take the initiative, and carry out research independently	E	I
Analysis and Research		
Proven ability to conduct research independently to advance research agenda and to identify new research problems and solve them originally	E	A, I
Ability to identify or design computational and statistical analysis approaches to address specific research questions	E	A, I
Other Requirements		
Commitment to EDI principles and to the Organisation values	E	I

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.

CLOSING DATE FOR APPLICATIONS: Sunday 10th December 2023 at 23:59

Interviews will be conducted in January 2024.

TERMS AND CONDITIONS

This full-time post is offered on a fixed term basis for three years. The annual salary is £53,576 - £55,125 plus 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 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*.*