

The Alan Turing Institute

Lead Research Data Scientist – Science of Cities & Regions

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 Cities and Regions Programme seeks to advance its four core missions (mobility, land use, liveability, and digital twins) which are of fundamental importance to the Grand Challenges of the Institute, develop a technology platform that enables the delivery of the missions, and build social infrastructure around the Science of Cities and Regions. These goals are only possible by building further capacity at the Turing; increasing its relevance to stakeholders and university partners; consolidating its connectivity to other Turing programmes and activities; and producing world-leading applied research and innovation.

The Alan Turing Institute will coordinate the work to consolidate and grow a national community of academia, government, and industry partners and stakeholders in the Science of Cities and Regions. Each of our missions will also engage and promote a suitable international agenda, and will contribute actively to the development and deployment of capability in the Turing's Cities and Regions Technology Platform. The community and research team comprises domain specialists, data scientists, and practitioners who are working together to co-produce globally outstanding research and transformational innovations in the applications of data science and AI to real world problems of cities and regions.

This next phase of development in the Science of Cities and Regions aligns with the Institute's broader development of its priorities through the strategy for Turing 2.0, including delivering research aligned to national priorities, growing the community and taking national leadership to improve skills and understanding of AI.

ROLE PURPOSE

The Lead Research Data Scientist position involves technical leadership of projects or service delivery of a small team in areas that support significant research programmes in the Institute. The role takes responsibility for shaping the strategic direction of the project or service, delivering project outputs, and managing relationships with external stakeholders. The postholder will also work closely with the Research Programmes and play a significant role in the development and scoping of novel projects for the team that supports the research mission of the Institute.

The role will sit within the Cities and Regions Programme and work closely alongside the programme directors, three Group Leaders, and research team focused on the themes of Liveability, Mobility, and Digital Twins. It will have a major focus on developing complementary tools and techniques which are interoperable with the framework of an emerging Cities and Regions Technology Platform, in the design and delivery of which the Lead Research Data scientist will take substantial responsibility.

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The technical scope of the role involves:

- The application of state-of-the-art techniques in geographical data science and spatial AI e.g. network optimisation, agent-based modelling, reinforcement learning, machine learning in GIS, spatial data visualisation
- Efficient implementation of complex AI algorithms for onboarding, analysis and exploitation of spatial data including synthetic generation, model-based outputs and indicators, handling sparsity, and missing data
- Innovative approaches to managing spatial data, including in real time and at very high resolution
- Distributed computing approaches to optimise resource allocation and computational speed of novel methods and algorithms.
- Novel approaches to multi-dimensional classifiers and segmentation
- Perform technical trials and evaluation of new technology components.
- Managing of data scientists/research associates working on projects in geographical data science and spatial AI
- Ensure compliance with the secure handling of data and health and safety with all aspects of their work.

DUTIES AND AREAS OF RESPONSIBILITY

- Provide technical leadership and project management on multi-person projects (2 to 4 people), guiding the project directions synergistically with other related efforts and align with the strategic research goals of the Institute. Able to liaise with the PI and oversee the contribution to a larger project, delegate work packages and other tasks to team members, and take responsibility for their completion over the lifetime of the project.
- Are the primary person responsible for delivery of a service area of strategic importance to the Institute. The Lead Research Data Scientist is expected to shape the effort to align with the strategic goals of the Institute, coordinate team activities, manage delivery of several independent areas, solicit feedback, and tailor services in response to the changing operational needs of the Institute.
- Provide leadership for the team involvement in external projects within one or more domain challenge areas:
 - Work closely with the Programme Director to ensure projects align with the strategic research directions of the programme and draw upon the skills and experience of team members.
 - Mentors senior colleagues in this process, delegating work as is appropriate.
 - When necessary, author or contribute to research proposals to support these efforts.
 - Collaborate directly with stakeholder organisations and their data science teams, as necessary, to shape and deliver projects
- Responsible for making decisions regarding the design, functionality and capabilities of the Cities and Regions Technology Platform, working with stakeholders and research leaders to articulate the requirements
- Make recommendations regarding the use of emerging tools and techniques in geographical data science
- Recruit, build and line manage a team, including managing one to ones supporting individuals' optimal performance and promote professional development
- Present, disseminate and explain research outputs to external stakeholders and research collaborators via presentations, reports and well-documented software packages.
- Contribute to the life of the Institute and support its community:
 - Participate in broader Turing networks related to project work.
 - Support development of new internal projects and ways of working in conjunction with colleagues and other service delivery units in the Institute.
 - Deliver teaching and training to colleagues and students, including within the team in our regular skills sessions
- Develop, implement, and adapt state-of-the-art and novel data science, and artificial intelligence techniques emerging from the Institute and elsewhere to problems faced by the Turing's partners.
- Understand the problems of the Turing's partners and develop appropriate approaches to solving these problems.
- Perform experiments and develop capabilities, which might include: building and deploying machine learning models; applying data science, statistical and algorithmic techniques to data, designing and implementing data collection trials
- Ensure compliance with the secure handling of data and health and safety with all aspects of their 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 Computer Science, Geographical data science, Physics, Engineering, Mathematics or related discipline.	E	A
Undergraduate-level degree or higher in computer science, engineering, GIS, data science, mathematics, statistics or related-discipline	E	A
Knowledge and Experience		
Strong mathematics/physics, computing or geographical background, and preferably a strong AI background	E	A, I
Strong background in one or more of the following areas: spatial data visualisation, machine learning, reinforcement learning, large language models, spatial statistics	E	A, I
Experience developing software in a scientific computing context, ideally in Python, including the use of established libraries such as NumPy, Tensorflow, PyTorch, scikit-learn, pandas, geo-pandas,. Experience in development suites, systems and versioning products (e.g., Git, IDEs, Linux).	E	A, I
Development of algorithms that enable adaptability to changing conditions in open world problems	E	A, I
Interest in and/ or knowledge of multi sensor datasets	E	A, I
Developing for high performance hardware (CUDA, MPI, OpenMP)	D	A, I
Experience with public cloud platforms and related technologies	D	A, I
Experience leading a research project with a focus on machine learning for GIS, spatial statistics and data modelling, classification or geovisualisation	E	A, I
Experience leading a project to a successful conclusion.	E	A, I
Experience conducting and publishing research to the standard required by top-tier peer reviewed journals	E	A, I
An understanding of the importance of good practices for producing reliable software and reproducible analyses (e.g. version control, issue tracking, automated testing, package management, literate analysis tools such as Jupyter)	E	A, I
Communication		
Excellent written and verbal communication skills, including experience in the authoring of research papers or technical reports, and giving presentations or classes on technical subjects	E	A, I
Ability to negotiate and influence others	E	I
Project Delivery		
Ability to shape the direction of projects, deliver project outputs and manage relationships with key external stakeholders	E	I
Ability to provide technical leadership of projects that support significant research programmes in the Institute.	E	I

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Decision Making		
Independently make decisions which are low risk and that mainly affect themselves or a small number of people and are guided by regulation and practice.	E	I
Initiative and Problem Solving		
Ability to lead one's own work independently, including planning and execution	E	I
Ability to use own judgement to analyse and solve problems	E	I
Analysis and Research		
Experience managing, structuring, and analysing research data.	E	A, I
Ability to lead research within formal or informal teams and work collaboratively within a team of researchers.	E	I
Ability to adopt appropriate data analysis methods for the purpose, and produce clear reports to present the findings	E	I
Team Development		
Ability to support and demonstrate routine procedures to new team members	E	I
Other Requirements		
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 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 3533 or 0203 862 3516, or email recruitment@turing.ac.uk.

CLOSING DATE FOR APPLICATIONS: Tuesday 18 July 2023 at 23:59

TERMS AND CONDITIONS

This full-time post is offered on a permanent basis. The annual salary is £62,666 - £67,200 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 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.