

The Alan Turing Institute

Research Data Scientist/Research Software Engineer

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 400 researchers and a talented business team.

THE ROLE

The permanent research staff of the institute's Research Engineering Group work to realise cutting edge research as professionally usable software tools and to apply these to address real-world data science and modelling challenges.

The group's staff are research software engineers and data scientists. We note the considerable overlap between these emerging roles and embrace the breadth of interdisciplinary skills and diversity of approaches entailed in these fields. Staff can choose either job title, and change their choice as their career progresses.

In contrast to traditional research careers, we are committed expert collaborators, joining research teams to further the Institute's challenges. We collaborate with scholars across the institute's research community to enhance the applicability of research for particular problems. We work with clients in industry, government and the third sector to turn their data challenges into research questions. We value expertise across many domains and rely on this diversity to design tools, practices and systems to harness the power of data science around the world.

We create software and scripts that implement research and apply it to client data in a readable, reliable and reproducible fashion. We present conclusions of research and analysis to the research community and clients through presentations, research papers, and interactive data visualisations. We work with state of the art advanced high performance computing and cloud platforms to realise collaborators' data science and artificial intelligence research at scale.

We support the dissemination of research outputs through the publication and maintenance of open source research software packages. We contribute to the sustainability of the open source ecosystem by adding features, fixing bugs, maintaining tools, and supporting community management in new and existing packages.

DUTIES AND RESPONSIBILITIES

Successful candidates will:

1. Apply 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 clients
 - Understand the problems of clients in the public, private and third sectors, and develop appropriate approaches to solving these problems.
 - Understand which data are, or might be, available; and collect and manage this data.
 - Perform analyses, which might include: building statistical models; applying machine learning techniques; building models and simulations; or applying optimisation techniques.
 - Document processes for effective and efficient reuse across multiple domains.
2. Collaborate with research colleagues to develop and maintain software embodying research outputs
 - Develop a good understanding of the relevant theory and the needs of potential users of the software
 - Be responsible for the programming effort, including design and planning
 - Test and validate the software to a high quality standard
3. Present, disseminate and explain our work
 - Feedback the outcomes of analyses to clients and customers in the public, private, and third sectors in written form and in presentations.
 - Share research in the practice of data science and artificial intelligence with the scholarly community through research papers and conferences.
 - Publish, distribute, document and maintain research software packages.
4. Contribute to the life of the Institute and support its community
 - Deliver teaching and training to colleagues and students, including within the team in our regular skills sessions.
 - Support research colleagues to make the most of the institute's secure high performance computing environments for advanced research.
5. In addition, for senior staff only:
 - Provide technical project management and leadership for 1-3 research projects, ensuring successful outcomes, liaising with clients and colleagues to understand and prioritise project goals, and balancing client value with research outputs.
 - Line manage 1-3 other staff within the group, supporting their career development aspirations.
 - Take ownership of a particular domain challenge area or methodology for the group.
 - Develop new projects in conjunction with colleagues, authoring research proposals and agreeing involvement for the group in activities across the institute.

Requirements

Qualification

- A PhD degree or equivalent professional experience in a field with significant use of both computer programming and advanced statistical or numerical methods.

Skills and experience

ESSENTIAL

- A PhD degree or equivalent professional experience in a field with significant use of both computer programming and advanced statistical or numerical methods.
- Experience managing, structuring, and analysing research data.
- Experience managing and organising the parameters and results of computational experiments.
- Fluency in one or more modern programming languages used in research in data science and artificial intelligence. (We particularly work in R, Python, and modern C++, but demonstrable use of other programming languages for research, together with a facility for learning new languages, is most welcome.)
- 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 and Rmarkdown)
- Demonstrated enthusiasm and ability to rapidly assimilate new computational and mathematical ideas and techniques on the job, at a more than superficial level, and apply them successfully.
- Excellent written and verbal communication skills, including experience in the visual representation of quantitative data, documentation of software packages or data resources, the authoring of research papers or technical reports, and giving presentations or classes on technical subjects.
- Ability to lead one's own work independently, including planning and execution, and to collaborate productively as part of a team.

In addition, for senior staff only:

- Experience mentoring and evaluating the work of others (formal line management experience is not essential, but such applicants should be able to show significant evidence of informal mentorship.)
- Experience leading a project to a successful conclusion
- Demonstrable experience managing conflict and resolving stakeholder tensions
- **EITHER** Experience in making or evaluating the case for new projects (e.g. authoring or evaluating research proposals or business cases) **OR** Experience of managing, prioritising and resourcing a project portfolio.

DESIRABLE

Members of the research engineering group have a diverse range of experiences and backgrounds. Below are just some of the skills and experience we value that you might be able to bring to the team. We do not expect any single candidate to have all these experiences and if you have experience of a few of these in addition to the essential skills listed above, we would encourage you to apply. The list is also not exhaustive and if you have skills and experience you feel are relevant to the role that aren't listed here, we'd still like to hear from you.

We are a learning team and combine many techniques and approaches across our projects, so successful candidates will be able to demonstrate having learned new skills and, importantly, a commitment to develop new expertise in areas they have not already. Again, while the ability and commitment to learn new skills is critical, we would not expect all team members to learn all of the skills

listed below. Different team members develop different areas of expertise and interest and we combine these across the team to support the full range of projects we work on.

- Machine learning, including experience with one or more established software libraries.
- Computational statistics, particularly Bayesian modelling.
- Visualisation for understanding large, complex, or high-dimensional data
- Knowledge management and ontology engineering, semantic web.
- Mathematical and computational modelling of complex systems.
- Logic, planning, verification, and automated reasoning.
- Programming language and API design. Domain specific languages.
- Exposure to mixed or qualitative research methods
- User interface design and development with web technologies, especially for data visualisation and knowledge representation.
- Writing technical documentation.
- Advanced numerical simulation (e.g. FEM, CFD...)
- Experience with public cloud platforms.
- Experience working with confidential and sensitive data for research.
- Developing for high-performance computing hardware (CUDA, MPI, OpenMP).
- Experience contributing to, maintaining and/or leading open source research software projects.
- Experience building open source communities.
- Working with databases and APIs for the acquisition of parameter information for models.
- Experience working with legacy code, especially in traditional scientific programming languages (eg, Fortran, MATLAB, C).
- Developing and/or delivering teaching and training in computational or mathematical methods for research.
- Developing and/or delivering teaching and training in applications of data science methods for non-programming experts.
- Automated testing, software quality assurance and continuous integration.

Salary

£35-45,000 or £45-60,000 Senior (negotiable dependent on skills & experience)

Contract

Permanent - Full Time

How to Apply

If you consider that you meet the criteria set out in the person specification and wish to apply for the role, please click the apply button below. You will be required to register on the candidate portal and to submit an application form, including your CV and covering letter.

Application

Please submit a CV (max 3 pages, no photos) and a cover letter telling us why you would like to work at the Turing. If you are happy to share links to research papers, blog posts or Github repositories containing work that you have made significant contribution to, we would like to see it.

Please be aware we have a twin advert for the same position available in our Defence and Security programme. If you would like to be considered for Data Scientists in Defence & Security please submit your CV to the other job advert " Data Scientists D&S" and specify your preference in your covering letter.

Interview

As part of their interview candidates will be expected:

At Standard or Senior level:

- To prepare a 10 min presentation on code the candidate has written that **EITHER** demonstrates some important aspects of research software engineering **OR** demonstrates an important data science algorithm. Existing examples of work are acceptable as long as the code was substantially written by the candidate and the candidate should be prepared to answer questions about both the code and the research challenge it addresses or the algorithm it demonstrates. Any source code shared for the interview will be treated in the strictest of confidence.
- To describe to us their previous experience and competencies for the role. There will also be a problem solving discussion with the interview panel, using a whiteboard and pen to arrive to an understanding of a proposed data analysis challenge.

At Senior or Principal level:

- To describe experiences related to challenging events in personnel and project management.

At Principal level:

- To explain their vision for the role, and how that vision is complementary to those of existing Principals.

If you have queries or would like to discuss the role further, please contact May Yong, Research Software Engineer, at myong@turing.ac.uk. If you have further questions or would like to discuss other HR questions further with a member of the Institute's HR Team, please contact them on 0203 862 3394 or email jobs@turing.ac.uk.

Applicants who would like to receive this advert in an alternative format or who are unable to apply online should contact us by telephone on 0203 862 3394 or via email at jobs@turing.ac.uk

Closing date for applications: Rolling Recruitment. Applications reviewed monthly.

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, religion or belief or sexual orientation. Reasonable adjustments are available to support candidates through the application and interview process. Happy to Talk Flexible Working

Please note all offers of employment are subject to continuous eligibility 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.