

The Alan Turing Institute

RESEARCH DATA SCIENTIST / RESEARCH SOFTWARE ENGINEER

The Alan Turing Institute

The Alan Turing Institute is the national centre for data science and artificial intelligence, established in 2015 with the mission to make great leaps in data science research to change the world for the better.

The Institute has cross-disciplinarity at its core; we bring researchers in mathematics and theoretical computer science, statistics and machine learning, algorithms for data analytics and distributed computing, computational social science and data ethics, and industry partners, to work together in an open and collaborative environment with a shared goal to generate world-class research in data science.

Our researchers are motivated by driving impact, both through theoretical development and application to real-world problems. In our first year we have identified eight challenge areas to focus our translational research:

- Fostering Government Innovation;
- Supercharging research in science and humanities;
- Designing computers for the next generation of algorithms;
- Making algorithmic systems fair, transparent and ethical;
- Shining a light on our economy;
- Managing security in an insecure world;
- Delivering safer, smarter engineering;
- Revolutionising Healthcare.

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 and with clients to turn their challenges into research questions. 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, and support the dissemination of research outputs through the publication and maintenance of open source research software packages.

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.

Duties & Responsibilities

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
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.

Person Specification

Essential

Candidates must be able to demonstrate, through examples, the below capabilities:

- 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, 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
- Experience authoring research proposals or business cases

Desirable

We do not of course at all expect any candidate to have experience of all of the below! We are a learning team, combining many techniques and approaches to address our projects. Successful candidates will be able to demonstrate existing knowledge of more than one, depending on experience level, and, importantly, a commitment to develop new expertise in others.

- 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.
- 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 open source research software projects
- 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)
- Experience leading teaching and training in computational or mathematical methods for research.
- Automated testing, software quality assurance and continuous integration.

How to apply

Along with a CV and covering letter, candidates should submit a research output as part of their application. This might be a link to a published research paper or a chapter of a thesis or dissertation, but we particularly encourage applicants to submit a link to a public version control tool such as GitHub containing an example analysis script or research software library.

Applications should be submitted to [:jobs@turing.ac.uk](mailto:jobs@turing.ac.uk). If you have queries or would like to discuss the role further, please contact James Hetherington, Head of Research Engineering, at jhetherington@turing.ac.uk.

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, gender reassignment, marital and civil partnership status, pregnancy, religion or belief or sexual orientation. Reasonable adjustments to the interview process can also be made for any candidates with a disability.

Terms & Conditions

Salary will be commensurate with the level of experience and seniority of the successful candidate(s). This is a full time, permanent post, to be held at the Institute's site at the British Library, Euston Rd, London.

Although this is offered as a full time role based in the London offices, we are extremely supportive of other working models compatible with candidates' lives. Requests to work flexibly, in location or in time, or other reasonable adjustments, will be given positive consideration.

A generous benefits package includes flexible working, 30 days' holiday excluding bank holidays, Cycle2Work, childcare vouchers, contributory pension, health and life assurance and range of other benefits that you would expect from a good employer. A relocation allowance is payable where appropriate.

Secondments from partner establishments will be considered for a minimum two-year period of secondment.