

# The Alan Turing Institute

## Data Scientist / Senior Data Scientist – Defence & Security

### 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 Defence & Security programme at the Institute is forming a new team of data scientists in order to solve real-world problems aligned with securing the UK.

The team will collaborate with scholars across the institute's research community to enhance the applicability of research for particular problems. It will work with our partners from across UK Government to turn their data challenges into research questions. The team will create software and scripts that implement research and apply it to client data in a readable, reliable and reproducible fashion. It will present conclusions of research and analysis to the research community and clients through presentations, research papers, and interactive data visualisations. It will work with state-of-the-art advanced high-performance computing and cloud platforms to realise collaborators' data science and artificial intelligence research at scale.

The team will support the dissemination of research outputs through the publication and maintenance of open source research software packages. It will 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, where appropriate.

## 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 partners
  - Understand the problems of partners 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:
  - Line manage 1-3 other staff within the group, supporting their career development aspirations.

## 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, 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

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.
- 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.
- Code review in a distributed team.

## 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, covering letter and contact details for your referees. Along with a CV and covering letter, please submit a research output to support your application, for us to read before the interview. This might be a link to a selected research or technical paper, a technical blog post 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 they have made a significant contribution to. You will be asked questions on this output as part of the interview.

If you have queries or would like to discuss the role further, please contact the Defence & Security Programme via [dsprogramme@turing.ac.uk](mailto:dsprogramme@turing.ac.uk).

If you would like to apply using a different format, please contact them on 0203 862 3394 or email [jobs@turing.ac.uk](mailto:jobs@turing.ac.uk).

## CLOSING DATE FOR APPLICATIONS: 31/10/2019

### Interview

As part of their interview candidates will be expected:

- To prepare a presentation on your favourite algorithm in data science, artificial intelligence, modelling or simulation. This should be delivered using a literate programming tool, such as Jupyter or RMarkdown, and it should include real code the candidate has written.
- To answer a challenging question on data analysis for research, using a whiteboard and pen to sketch their understanding of a proposed data challenge.

### TERMS AND 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.
- 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.

*This full-time post is offered on a fixed-term contract for a period of 24 months starting or as soon after that as possible. Salary £35-45,000 or £45-60,000 Senior (negotiable dependent on skills & experience) plus excellent benefits. <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, 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. 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](mailto:HR@turing.ac.uk).***