

The Alan Turing Institute

RESEARCH ASSOCIATE - AI SOLUTIONS FOR FRAUD DETECTION (PROJECT FAIR)

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 ['Finance and Economics' programme \(FE\)](#) brings together leading experts in data science, machine learning, finance and the social sciences, from both academia and industry to tackle the most challenging questions by producing world-leading research with significant impact. The programme works closely with government and the industry to exploit the potential of new technologies in the financial sector and economic research, and to position the UK as the leader in these areas. The programme is led by the Programme Director, Lukasz Szpruch.

One of the aims of FE is to develop an actionable framework for safe deployment of AI in Financial Services, underpinned by foundational research methodologies from across five main research themes:

1. Robustness and Resilience
2. Privacy and Security
3. Fairness and Transparency
4. Verification and Accountability
5. Integration Environment

Find out more: [FAIR: Framework for responsible adoption of artificial intelligence in the financial services industry](#).

The Turing are hiring a team of Research Associates focused on tackling key challenges within the financial sector under the direction of the Turing Programme Director, and the project PIs. These Research Associates will focus on a specific challenge and work with Research Associates tackling fundamental research in each of the key research themes of FAIR, to build tools and techniques to tackle these challenges.

We are looking for a Research Associate to lead on designing methodological approaches to detecting fraud, working with our external partners and sharing expertise with researchers across the FAIR Programme. Fraud is a major challenge for financial services with some estimates stating that it costs the UK economy up to £219 billion a year¹. The FAIR Programme has worked with external partners such as HSBC and FCA, to develop techniques for detecting Fraudulent activity, and for improving data sharing capabilities between financial institutions which is one of the main bottlenecks to effectively combat fraud.

ROLE PURPOSE

The successful candidate will support on the theoretical and methodological development of new data science techniques for detecting financial fraud leveraging new methodologies that have emerged over the last few years. Particular emphasis will be put on leveraging complex dependencies in financial transaction data. The techniques to be developed are anticipated to draw on graph neural networks and both supervised and unsupervised learning of data which may contain network structure; they will also draw on statistical techniques such as causal inference and counterfactual analysis.

The candidate will join a vibrant team of researchers and will have opportunities to engage with cutting-edge projects and experts at leading universities. These will include Sam Cohen, Gesine Reinert and Marta Kwiatkowska (Oxford), Carsten Maple and Graham Cormode (Warwick), Adrian Weller (Cambridge), Andrew Elliott (Glasgow) Philip Treleaven (UCL) and Lukasz Szpruch (Edinburgh), as well as project teams funded by other strategic partnerships.

In addition, the successful candidate will have an opportunity to interact with key industry leads on issues related to fraud and data science within financial services.

DUTIES AND AREAS OF RESPONSIBILITY

General duties for Research Associate posts

- Publish and disseminate high-quality research papers and publications detailing research outputs and project case-studies.
- Cultivate strong relationships with internal stakeholders, liaising with teams across the Turing as required.
- Communicate or present research outputs to diverse stakeholders, through conferences, events, meetings, and press opportunities as appropriate.
- Participate in internal meetings with relevant groups, stakeholders, as well as external meetings with representatives of industry and potential partner organisations
- Work collaboratively with academic experts and broader research partners from across the Turing and the wider Turing community.
- Undertake required administration tasks.
- Contribute to the life of the Institute and support a diverse and inclusive community through embracing the Turing values.
- Adhere to and promote principles of reproducible and ethical data science and ensure secure handling of data and health and safety in all aspects of work.

Specific to the project/programme/role:

- Undertake high-quality research, contributing to the broader research aims of the FAIR Programme.

¹ [1] <https://www.petersandpeters.com/2023/07/26/what-is-the-cost-of-fraud-in-the-uk/>

- Develop and apply state-of-the-art robust statistical and machine learning methodologies to tackle business-inspired research challenges of the Turing partnerships using techniques such as
 - Graph neural networks
 - Statistical networks analysis
 - Causal inference
 - Mathematical and statistical modelling
- Work collaboratively with a team of research associates focused on fundamental research in each of the themes of FAIR and develop responsible AI tools and techniques through the FAIR framework.
- Undertake high-quality research, contributing to the broader research aims of the FAIR Programme.

OTHER DUTIES

- Teaching may be required as part of collaboration work.
- Travel may be necessary to meet requirements of the role

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.

PERSON SPECIFICATION

<p align="center">Skills and Requirements</p> <p align="center">Post holders will be expected to demonstrate the following:</p>	<p align="center">Essential (E) Desirable (D)</p>	<p align="center">Tested at application (a) Tested at interview (i)</p>
Education/Qualification		
A PhD (or equivalent experience and/or qualifications) in a relevant area which will include Mathematics, Computer Science or similar inter-disciplinary subjects.	E	A
Research Assistant level: must be near completion of PhD in a relevant area which will include Mathematics, Computer Science or similar inter-disciplinary subjects.	E	A
Knowledge and Experience		
<p>A solid background in one or more of the following:</p> <ul style="list-style-type: none"> • Network analysis • Time series • Financial risk management • Reinforcement learning • Counterfactuals and wider exAI • Machine learning including foundation models 	E	A
Experience in design, development and implementation of research software tools and libraries, in languages such as Python, Java and R with experience in GPU programming (Tensorflow, PyTorch, etc) and other common data science libraries.	E	A I
Track record of the ability to initiate, develop and deliver high quality research aligned with the research strategy indicated by the PI and any industrial stakeholders and to publish in peer reviewed journals and conferences.	E	A I
Ability to rapidly assimilate new computational, mathematical and statistical ideas and techniques on the job and apply them successfully.	D	A I
Ability to create and promote a collegial and collaborative approach to interdisciplinary research activities.	D	A I
Understanding of how fraud is perpetrated and the commercial realities of tackling fraud.	D	A I
Communication		
Excellent written and verbal communication skills including the ability to present complex or technical information, and to communicate effectively with other stakeholders outside the research community	E	A I
Ability to adapt the style of communication to the audience and ensure understanding	E	A I
Liaison and Networking		
Ability to collaborate successfully with colleagues in a multidisciplinary environment within the organisation/externally to share knowledge and information in order develop practice or help others learn	E	A I

Willing to contribute to discussions and make decisions as part of a team, and across teams, providing support to others as required, with an approachable and flexible attitude towards work	E	A I
Willing to represent the Turing at events and external meetings	E	I
Decision-Making Processes and Outcomes		
Ability to lead one's own work, including planning and execution, and to prioritise work to meet deadlines	E	A I
Ability to 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
Able to consider possible solutions and identify with evidence those which offer the widest benefits	E	I
Analysis and Research		
Ability to take the initiative, and carry out research independently or collaboratively under the guidance of the PI	E	A I
Able to work with supervisors to plan, co-ordinate and implement research activity, including managing research resources	E	A I
Ability to keep accurate and up to date knowledge of services available in own and related areas of work	E	A I
Teaching and Learning		
Teaching may be required as part of the role	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 13 OCTOBER 2024 AT 23:59 (LONDON, UK BST)

TERMS AND CONDITIONS

This full-time post is offered on a fixed term basis for 2 years. The annual salary is £44,180 - £49,966 plus excellent benefits, including flexible working and family friendly policies, <https://www.turing.ac.uk/work-turing/why-work-turing/employee-benefits>

Candidates who have not yet been officially awarded their PhD will be appointed as Research Assistant at a salary of £41,352 per annum.

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.