Research Associates – Probabilistic Modelling of Forensic Evidence

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

We are seeking a full-time post-doctoral Research Associate (RA) to work on the Turing Project "Evaluation of Complex Forensic Evidence". The researcher will be part of a team of top academics in Bayesian statistics, decision theory and causal inference and be based at The Alan Turing Institute in London. The research team includes: Dr Anjali Mazumder (co-PI), Dr Amy Wilson (co-PI), Professor Jim Smith (Warwick), Professor Philip Dawid (Cambridge), Professor Henry Wynn (LSE), and colleagues across Europe and the US. Researchers will meet regularly with the research team and will engage with forensic science practitioners in industry and government.

Forensic evidence can consist of multiple different types of evidence (e.g. DNA, blood stains, eyewitness) that can be highly correlated (e.g. DNA evidence taken from a blood stain), with each case having unique types and networks of relevant information. There is often limited population and experimental data, so methods for eliciting information from experts and dealing with epistemic uncertainty are required. This project aims to draw upon real cases to determine a framework for the evaluation of complex forensic evidence that deals with the multiple statistical issues and complex data structures that can occur. There is particular interest in understanding activity level propositions, using graphical representations such as Bayesian networks, Wigmore charts and chain event graphs.

The specific goals are:

- Developing a coherent and systematic probabilistic framework for the interpretation of complex criminal cases, that accounts for multiple types of evidence, addresses propositions at different levels, and incorporates expert judgement and multiple sources of uncertainty.

- Developing statistical methods to address the computational complexities of combining different modelling substructures, to model evidence conflict, and to facilitate the modelling of the case circumstances.
- Applying modern approaches to statistical causal reasoning to understand the relevance of the evidence to the legal issues in a case.

Informal enquiries may be made to the PIs (Amy.L.Wilson@ed.ac.uk and amazumder@turing.ac.uk).

DUTIES AND RESPONSIBILITIES

- Perform high quality research in Bayesian statistical modelling, causal inference and its applications as relevant to the project.
- Write and contribute to research publications, documenting results of the research, to publish in relevant peer-reviewed scientific journals of international standing, to present these results at conferences and workshops, and to communicate results to a wide audience and through multiple mediums.
- Assist in the organisation of and participate in regular meetings and special workshops with the research team, designated members of staff and with other collaborators.
- Collaborate with colleagues in government and industry both on research and on taking methods developed towards wider use.
- Travel as necessary to meet with internal and external collaborators.
- Take initiative and make original contributions to the research programme wherever possible, and to contribute freely to the team research environment in a manner conducive to the success of the research project as a whole.

PERSON SPECIFICATION

The successful candidate will have:

Essential

- PhD (or close to completion) or equivalent experience in statistics, machine learning, or a related discipline.
- Excellent written and verbal communication skills, including the ability to present complex or technical information, and to communicate effectively with analysts and other stakeholders outside the research community.
- Ability to collaborate successfully with colleagues in government and industry.
- Ability to work as a member of a team.
- Ability to lead one's own work, including planning and execution, and to prioritise work to meet deadlines.
- Ability to organise working time, take the initiative, and carry out research independently, under the guidance of the PI.

Desirable

- Experience in forensic science would be useful but is not required.
- Specialist expertise in a relevant area of methodology, including Bayesian modelling and causal inference.
- Experience of collaboration with government, or with analyst teams in other sectors outside academic research.
- Experience of collaboration with other academic disciplines.

TERMS AND CONDITIONS

This full-time post is offered on a fixed-term basis of up to 3 years. We are happy to talk flexible working.

The annual Salary is £35,000 - £41,000.(dependent on skills and experience), plus an excellent benefits.package (https://www.turing.ac.uk/work-turing/why-work-turing/employee-benefits).

APPLICATION PROCEDURE

f you are interested in this opportunity, please click the apply button below. You will need to register on the applicant's portal and complete the application form including your CV, covering letter and contact details for your referees.

If you have questions or would like to discuss the role further with a member of the Institute's HR Team, please contact them on 0203 862 3394 or 020 3862 3357, or email recruitment@turing.ac.uk.

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.

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***.***