



### Further Information: HR7.

Job title	Research Assistant / Associate in Probabilistic Machine Learning
Grade	5/7
Salary range	Research Assistant: £32,296 - £34,866 Research Associate: £36,924 - £45,163
Staff Group	Research
Department / Institution	Department of Engineering

## Role-specific information

### Role Summary

We invite applications for a Research Assistant/Associate position at the University of Cambridge to join the *Prob\_AI Hub*. The vision of the Prob\_AI hub is to develop a world-leading, diverse and UK-wide research programme in probabilistic AI. The hub will develop the next generation of mathematically-rigorous, scalable and uncertainty-aware AI algorithms. This will be achieved by bringing together world-leading researchers across Applied Mathematics, Computer Science, Probability and Statistics, who engage with a range of non-academic partners; transforming the people pipeline; and producing a culture change within the mathematical sciences more broadly, so that cross-disciplinary mathematics research in AI is the norm.

This £8.5M programme is funded by EPSRC and brings together research groups from the Universities of Lancaster, Bristol, Cambridge, Edinburgh, Manchester and Warwick. There is a 3-year position available at each of these six institutions. This advert relates to the PDRA position at the University of Cambridge. Interaction between the research groups at the six universities will be strongly encouraged and resourced, with broad research projects to involve substantial cross-institutional collaborations.

This position will also initially contribute to a unique and significant research programme, synergistic to the Prob\_AI Hub, called *Machine Learning for Tomorrow* which is jointly run by the Machine Learning Group in the Department of Engineering at the University of Cambridge and Microsoft Research Cambridge. The goal of the programme is to develop new fundamental machine learning tools to overcome current deficiencies that will enable AI systems to be deployed in an efficient, flexible, robust and automated way. This project will end in July 2025. Microsoft are also active participants in the Prob\_AI Hub.

The Research Assistant/Associate will join the Machine Learning Group at the Department of Engineering, working with Prof. Richard E. Turner. We are particularly interested in the following areas: machine learning for partial differential equations; functional neural representations; stochastic processes and deep learning; diffusion and probability flow for spatio-temporal models. We are interested in methodological contributions which will drive advancements in spatio-temporal prediction, for instance in the environmental sciences such as weather forecasting and climate modelling. For more information about the local research group, please see here: <https://rich-turner-group.github.io>

You should have, or be close to completing, a PhD in Machine Learning, Statistics, Mathematics, or a related discipline. The Prob\_AI Hub’s research programme involves developing mathematical understanding of AI that will lead to more reliable, interpretable and uncertainty aware AI methods. We are keen to encourage applications from anyone with the mathematical skills needed to undertake such research. Experience working in AI, whilst desirable, is not absolutely required. Relevant mathematical background includes, but is not limited to: Bayesian statistics, computational statistics, inverse problems, numerical analysis, probability, statistical machine learning, stochastic analysis and uncertainty quantification. You will have demonstrated the ability to develop either new methodology or new mathematical understanding. We are particularly keen to encourage applicants with strong computational skills and the demonstrable ability to produce academic writing of the highest publishable quality is essential.

This is a full-time position, but we will consider applicants requesting part-time or other flexible working arrangements. We welcome applications from people in all diversity groups.

Appointment at Research Associate level is dependent on having a PhD. Those who have submitted but not yet received their PhD will be appointed at Research Assistant level, which will be amended to Research Associate once the PhD has been awarded.

## Key Responsibilities

Research and Scholarship	%
<ul style="list-style-type: none"> <li>• Develop research objectives and proposals for own and/or joint research.</li> <li>• Conduct individual and collaborative research projects.</li> <li>• Write up research work for presentation and publication.</li> <li>• Continually update knowledge and understanding in field or specialism.</li> <li>• Translate knowledge of advances in the subject areas into research activity, including software outputs.</li> <li>• Manage own research and administrative activities, with guidance if required.</li> <li>• Assist in the preparation of reports, proposals and applications to external bodies, e.g. for funding and contractual purposes.</li> <li>• Communicate material of a specialist or highly technical nature.</li> </ul>	<b>70</b>

<b>Teaching and Learning support</b>	<b>%</b>
<ul style="list-style-type: none"> <li>• May assist in the supervision of student projects.</li> <li>• Provide limited supervision/instruction to classes.</li> <li>• May assist in the development of student research skills.</li> <li>• May plan and deliver seminars relating to research area.</li> </ul>	<b>5</b>
<b>Liaison and networking</b>	<b>%</b>
<ul style="list-style-type: none"> <li>• Liaise with other members of the Prob_AI Hub.</li> <li>• Attend Hub events (workshops, summer schools) and help contribute to organisation.</li> <li>• Build internal and external contacts and participate in networks for the exchange of information and to form relationships for future collaboration.</li> </ul>	<b>20</b>
<b>Planning and organising</b>	<b>%</b>
<ul style="list-style-type: none"> <li>• Plan the use of research resources.</li> <li>• Plan and manage own research activity in collaboration with others.</li> <li>• Contribute to planning of joint research projects led by Principal Investigator.</li> </ul>	<b>5</b>

<b>Location</b>	Department of Engineering, Trumpington Street, Cambridge, CB2 1PZ.
<b>Working pattern</b>	Full time.
<b>Hours of Work</b>	Your employment is full time. There are no conditions relating to hours and times of work but you are expected to work such hours and days as are reasonably necessary for the proper performance of your duties. Your times of work should be agreed between you and your head of institution, or his/her nominee.
<b>Length of appointment</b>	36 months.
<b>Limited funding</b>	This post is funded by a research grant or contract and, in the event that this funding should cease, the post may be at risk of redundancy. In the first instance, the funding supporting the post lasts for 36 months and the head of department, or his/her nominee, will keep the role holder informed of the funding situation.

<b>Probation period</b>	The probation period is six months.
<b>Annual leave</b>	Full time employees are entitled to annual paid leave of 6.6 weeks (or 41 days for those working full time), inclusive of public holidays (pro-rata for part-time staff). The period for calculating entitlement to holiday leave in any particular year is the academic year i.e. 1 October to 30 September.
<b>Pension eligibility</b>	<p>You will automatically become a member of the Universities Superannuation Scheme (USS) on commencement of employment.</p> <p>Please note that it is not possible to opt out of the scheme until you have received certain specified information about the pension scheme and this will be sent to you shortly after you have been paid for the first time.</p> <p>Pension scheme details are available on our web pages at: <a href="http://www.pensions.admin.cam.ac.uk/">http://www.pensions.admin.cam.ac.uk/</a>. Information about the legal requirement for the University to automatically enrol its eligible jobholders into a qualifying workplace pension scheme is available on our web pages at: <a href="http://www.pensions.admin.cam.ac.uk/auto-enrolment-workplace-pensions">http://www.pensions.admin.cam.ac.uk/auto-enrolment-workplace-pensions</a>.</p>
<b>Retirement age</b>	The University does not operate a retirement age for research staff. Further details are available in the University Retirement Policy on our web pages at <a href="http://www.hr.admin.cam.ac.uk/policies-procedures/retirement-policy/statement-policy">http://www.hr.admin.cam.ac.uk/policies-procedures/retirement-policy/statement-policy</a> .

## Person Profile

This section details the knowledge, skills and experience we require for the role.

<b>Education &amp; qualifications</b>	Applicants must have (or be close to obtaining) a PhD in Machine Learning, Mathematics, Statistics, Computer Science or a closely related discipline.
<b>Specialist knowledge &amp; skills</b>	<p>Essential: knowledge of Machine Learning. Excellent mathematical and programming skills.</p> <p>Desirable: knowledge and skills in some subset of statistics, machine learning, stochastic processes, PDEs, probabilistic modelling, Bayesian methods, and numerical methods.</p>
<b>Interpersonal &amp; communication skills</b>	Essential: Excellent written and presentation skills. Experience presenting and interacting with academic and industry partners.
<b>Relevant experience</b>	Essential: relevant research publications in the areas listed under <b>Specialist knowledge &amp; skills</b> above.

<b>Additional requirements</b>	Experience of managing own workload. Willingness to continually update knowledge in the specialist area and engage in continuous professional development. Desirable: Experience supervising projects and working in a team.
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## Terms and Conditions

### Pre-employment Check Requirements

We have a legal responsibility to ensure that you have the right to work in the UK before you can start working for us. If you do not have the right to work in the UK already, any offer of employment we make to you will be conditional upon you gaining it. If you need further information, you may find the Right to Work page within the 'Applying for a job' section of the University's Job Opportunities pages helpful (please see <http://www.jobs.cam.ac.uk/right/have/>).

### Application Process

To submit an application for this vacancy, please click on the link in the 'Apply online' section of the advert published on the University's Job Opportunities pages. This will route you to the University's Web Recruitment System, where you will need to register an account (if you have not already) and log in before completing the online application form.

Please ensure that you upload your Curriculum Vitae (CV), which should include a list of your publications with three that are relevant to the role highlighted, and a covering letter in the Upload section of the online application. If you upload any additional documents which have not been requested, we will not be able to consider these as part of your application.

Anticipated interview date: as soon as possible after the closing date with the exact time and date to be confirmed. The interviews will take place at the Department of Engineering. Remote interviews will be possible for applicants who cannot attend in person.

If you have any questions about this vacancy, please contact Francesca McCaughan [cbl-enquiries@eng.cam.ac.uk](mailto:cbl-enquiries@eng.cam.ac.uk).

## General Information

### The University of Cambridge

The University of Cambridge is one of the world's oldest and most successful Universities, with an outstanding reputation for academic achievement and research. It was ranked first in the 2011 QS World University Rankings and its graduates have won more Nobel Prizes than any other university in the world. The University

comprises more than 150 departments, faculties, schools and other institutions, plus a central administration and 31 independent and autonomous colleges.

The University and the Colleges are linked in a complex historical relationship. The Colleges are self-governing, separate legal entities which appoint their own staff. They admit students, provide student accommodation and deliver small group teaching (supervisions). The University awards degrees and its faculties and departments provide lectures and seminars for students, determine the syllabi for teaching and conduct research.

There is much more information about the University at <http://www.cam.ac.uk/univ/works/index.html> which we hope you will find helpful.

## Department of Engineering

The Department of Engineering is the largest department in the University of Cambridge, representing approximately 10% of the University's activities by the majority of common metrics, and is one of Europe's largest integrated engineering departments. It achieves the highest standards in both research and teaching. Its international reputation attracts the best students, academics, sponsors and partners from around the world.

The Department seeks to benefit society by creating world-leading engineering knowledge that fosters sustainability, prosperity and resilience. We share this knowledge and transfer it to industry through publication, teaching, collaboration, licensing and entrepreneurship. By integrating engineering disciplines in one department, we can address major challenges and develop complete solutions, serving as an international hub for engineering excellence.

## Computational and Biological Learning Lab

The Computational and Biological Learning Lab is a rapidly growing research group in the Department of Engineering consisting of approximately 75 researchers. Research in CBL includes both Computational Neuroscience and Machine Learning. The post will be based in the Machine Learning Group, headed by Professor Carl Rasmussen and which also includes Professor Richard E. Turner, Professor Zoubin Ghahramani, Dr. Miguel Hernandez Lobato, and Dr. Adrian Weller. Further details about the Machine Learning Group can be found at <https://mlg.eng.cam.ac.uk>.

Richard Turner's group is part of the Machine Learning Group. The group's research interests include: Probabilistic Machine Learning Fundamentals (including generative models and uncertainty-aware approaches); Environmental Prediction (especially for weather, earth systems, and climate prediction); and Spatio-temporal Modelling (especially using a fusion of large-scale deep learning and probabilistic modelling for scientific applications). Information about the group can be found here: <https://rich-turner-group.github.io>

## What the University can offer you

One of our core values at the University of Cambridge is to recognise and reward our staff as our greatest asset. We realise that it's our people who have built our outstanding reputation and that we will only maintain our leading position in the

academic world by continuing to attract and retain talented and motivated people. If you choose to come and work with us, you will find that we offer:

- **Excellent benefits** – You will be eligible for a wide range of competitive benefits and services, including numerous discounts on shopping, health care, financial services and public transport. We also offer defined benefits pension schemes and tax-efficient bicycle, car lease and charity-giving schemes.

We will help you balance your home and work life by providing you with generous annual leave entitlement and procedures for requesting a career break or flexible working arrangements if you need them. You will also have access to a range of well-being support services, including in-house Occupational Health and Counselling services. If you have childcare responsibilities, you may also benefit from the enhanced maternity/adoption pay, two nurseries and a holiday play scheme that we provide.

We are keen to welcome new employees from other parts of the UK and other countries to Cambridge. If you will be relocating to Cambridge on a centrally funded appointment of two years or more, you may be eligible for our relocation expenses scheme. The University Accommodation Service will also be available to help you find suitable rented accommodation and to provide advice on renting arrangements and local facilities, if required. In addition, certain academic and academic-related appointments are eligible for the Shared Equity Scheme which offers financial assistance with the purchase of living accommodation. You may find the pages at [www.internationalstaff.ac.uk](http://www.internationalstaff.ac.uk) helpful in planning a relocation.

- **A welcoming and inclusive environment** - We will help you settle into your new role and working environment through a central University induction event, local induction activities and our online induction package. Where appropriate to your role, you will have a probation period to provide a supportive framework for reviewing your progress and discussing your training and development needs.

If you are relocating to Cambridge, you and your family will be welcome to attend the Newcomers and Visiting Scholars Group, which provides an opportunity to find out more about Cambridge and meet other people new to the area.

- **Extensive development opportunities** - The encouragement of career development for staff is one of the University's core values. We put this into practice through various services and initiatives, including:
  - A wide-range of training courses and online learning packages.
  - The Staff Review and Development (SRD) Scheme, which is designed to enhance work effectiveness and facilitate career development post-probation.
  - Leave for career and personal development, including long-term study leave for assistant staff and sabbatical leave for academic staff.
  - The CareerStart@Cam programme, which supports assistant staff roles without higher education qualifications to develop their skills, experience and qualifications. Assistant staff may also apply for financial assistance for study which results in a qualification.
  - Reduced staff fees for University of Cambridge graduate courses.
  - The opportunity to attend lectures and seminars held by University departments and institutions.
  - Policies and processes dedicated to the career development of researchers and the implementation of the principles of the Concordat, which have led to the University being recognised with an HR Excellence in Research Award by the European Commission.

You can find further details of the benefits, services and opportunities we offer can be found in our CAMBens Employee Benefits web pages at <http://www.admin.cam.ac.uk/offices/hr/staff/benefits/>. A range of information about living and working in Cambridge is also available to you within the University's web pages at <http://www.jobs.cam.ac.uk/> and <http://www.admin.cam.ac.uk/offices/hr/staff/>.

## Equality of Opportunity at the University

We are committed to a proactive approach to equality, which includes supporting and encouraging all under-represented groups, promoting an inclusive culture and valuing diversity. We make selection decisions based on personal merit and an objective assessment against the criteria required for the post. We do not treat job applicants or members of staff less favourably than one another on the grounds of sex (including gender reassignment), marital or parental status, race, ethnic or national origin, colour, disability (including HIV status), sexual orientation, religion, age or socio-economic factors.

We have various diversity networks to help us progress equality; these include the Women's Staff Network, the Disabled Staff Network, the Black and Minority Ethnic Staff Network and the Lesbian, Gay, Bisexual and Transgender Staff Network. In addition, we were ranked in the top 100 employers for lesbian, gay and bisexual (LGB) staff in Stonewall's Workplace Equality Index 2013 and we hold an Athena SWAN silver award at organisation level for promoting women in Science, Technology, Engineering and Medicine.

The Department is committed to promoting gender equality as part of a landscape of encouraging diversity, tolerance and a culture of mutual support. The dedicated Diversity Committee oversees equality, diversity and inclusion related activities in the Department, and holds regular events to promote Engineering to under-represented groups. The Department was first granted an Athena SWAN Silver Award in 2017, which was renewed in September 2020 to recognise the Department's ongoing commitment to advancing the careers of women in STEMM. The Department of Engineering continues to make excellent progress towards achieving gender balance amongst its staff and students. More information on the Athena SWAN Charter can be found [here](#).

## Information if you have a Disability

The University welcomes applications from individuals with disabilities and we are committed to ensuring fair treatment throughout the recruitment process. We will make adjustments to enable applicants to compete to the best of their ability wherever it is reasonable to do so, and, if successful, to assist them during their employment. Information for disabled applicants is available at <http://www.admin.cam.ac.uk/offices/hr/staff/disabled/>.

We encourage you to declare any disability that you may have, and any reasonable adjustments that you may require, in the section provided for this purpose in the application form. This will enable us to accommodate your needs throughout the process as required. However, applicants and employees may declare a disability at any time.

If you prefer to discuss any special arrangements connected with a disability, please contact, Francesca McCaughan, who is responsible for recruitment to this position, on +44 1223 7 48529 or by email on [cbl-enquiries@eng.cam.ac.uk](mailto:cbl-enquiries@eng.cam.ac.uk). Alternatively,

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you may contact the HR Business Manager responsible for the department you are applying to via [hrenquiries@admin.cam.ac.uk](mailto:hrenquiries@admin.cam.ac.uk).