



Job description and selection criteria

Job title	Research Associate on KTP project on “Automated Control of Services in Smart Buildings with Machine Learning”
Division	MPLS
Department	Computer Science
Location	Atamate office, Headington, Oxford.
Grade and salary	Grade 7: From £32,236 p.a.
Hours	Full Time
Contract type	Fixed term for up to 3 years
Reporting to	Prof. Alessandro Abate
Vacancy Reference	138896



The role

Research topic	Automated Control of Services in Smart Buildings with Machine Learning
Principal Investigator / supervisor	Prof. Alessandro Abate and Hugh Miles (CTO Atamate Ltd.)
Funding partner	Innovate UK and Atamate Ltd. (Oxford)

KTP stands for “Knowledge Transfer Partnership”, and is a three-year project that enables the establishment of a tight collaboration between a research group at a university and a company, towards knowledge transfer and development of new high-tech solutions. This position provides additional benefits, including funding for career development opportunities, such as training and attending conferences.

The researcher will be employed by the University of Oxford as a Research Associate in the Department of Computer Science, and they will be associated with the research group of Prof. Abate:

<http://www.oxcav.org>

The postholder’s place of work will be at the Atamate Ltd. Oxford office (<https://www.atamate.com>) and they will be responsible for managing the KTP Project and for delivering against the agreed objectives (cf. below).

This KTP will deliver advanced, automated and holistic control of smart building services. State-of-the-art machine learning (ML) will integrate sensor data and observed usage patterns for service control. Our goals are to lower the environmental impact of a building, to reduce its operational costs, whilst improving comfort and security.

The researcher will maximise the benefits of the Partnership to both the business organisation and the academic group and Oxford University, whilst enhancing her/his own personal and professional development.

The researcher will benefit from the learning and professional development on offer throughout the programme and, liaising between the University and the company to define the application of new technological solutions from research to products, will eventually be positioned to cover leadership roles within the company.

Interviews will be held at the Atamate Ltd. Oxford office.

Key Objectives of this Project:

- Review of literature to understand the issues in Smart Buildings, based on building physics, heating systems, ventilation systems and heat recovery systems.
- Company familiarisation to gain a thorough understanding of Atamate.
- In connection with the research group at the University, development of a novel solution concept, covering data gathering, model generation, machine learning

techniques for control. Focus on five independent services: Occupancy detection, Heating, Cooling, Ventilation, and Water control.

- Implementation of new control algorithms, and further improvements via quantitative feedback.
- Work with key personnel at Atamate to embed and transfer knowledge, in order to enable the proposed solutions to be commercialised with impact.
- Dissemination (academic and industrial) of results throughout the project.

The researcher will be working at the leading edge of utilising machine learning in the Smart Buildings sector and will have the opportunity to lead the development team to implement the new solutions.

Practical responsibilities and duties

- To undertake the work as defined in the KTP proposal and as agreed by Atamate and Oxford University.
- In collaboration with the project team, to ensure that existing knowledge arising out of Prof Abate's research group is transferred to Atamate for the purposes of the project.
- To undertake small scale project management in order to manage the project and its delivery effectively. In particular, to organise and lead monthly Project Team meetings, to provide written executive summaries, and to present project updates with proposals for future plans during the meetings.
- To maintain ongoing effective communication channels with academic and company supervisors.
- To be responsible for planning own personal and professional development including a Personal Development Plan.
- To collaborate in the preparation of academic papers, scientific reports, case studies, and journal articles.
- To participate in development and promotional events such as presenting and exhibiting at seminars and workshops.
- To represent the project at external meetings/seminars.
- To act as an ambassador for Oxford University and the Knowledge Transfer Partnership.
- To identify further collaboration opportunities between the business organisation and Oxford University.
- To compile a detailed final report at the end of the KTP Project for external evaluation.

Selection criteria

Essential

- Hold an MPhil/Masters in Computer Science, Mathematics or Physics, or related discipline, together with relevant experience in the areas of this project, and in particular with emphasis on Machine Learning.
- Expertise should include computational methods, mathematical modelling, numerical methods, coding.
- Ability to manage own academic research and associated activities, and to lead projects.
- Previous experience of contributing to publications/presentations.
- Excellent communication skills, including the ability to write for publication, present research proposals and results, and represent the research group at meetings.

Desirable

- Hold a PhD/DPhil (or to be close to completion)* in Computer Science, Mathematics or Physics, or related discipline, together with relevant experience in the areas of this project, and in particular with emphasis on Machine Learning.
- Coding experience with a procedural language, such as Python, C/C++, Java.

*Evidence required:

EITHER a copy of your PhD/ DPhil award certificate;

OR an academic reference confirming the qualification has been awarded;

OR an academic reference confirming that you have submitted your thesis, if you have not yet completed.

About the University of Oxford

Welcome to the University of Oxford. We aim to lead the world in research and education for the benefit of society both in the UK and globally. Oxford's researchers engage with academic, commercial and cultural partners across the world to stimulate high-quality research and enable innovation through a broad range of social, policy and economic impacts.

We believe our strengths lie both in empowering individuals and teams to address fundamental questions of global significance, while providing all our staff with a welcoming and inclusive workplace that enables everyone to develop and do their best work. Recognising that diversity is our strength, vital for innovation and creativity, we aspire to build a truly diverse community which values and respects every individual's unique contribution.

While we have long traditions of scholarship, we are also forward-looking, creative and cutting-edge. Oxford is one of Europe's most entrepreneurial universities. Income from external research contracts in 2016/17 exceeded £564m and we rank first in the UK for university spin-outs, with more than 130 companies created to date. We are also recognised as leaders in support for social enterprise.

Join us and you will find a unique, democratic and international community, a great range of staff benefits and access to a vibrant array of cultural activities in the beautiful city of Oxford.

For more information please visit www.ox.ac.uk/about/organisation

Department of Computer Science

The Department of Computer Science was established in 1957, making it one of the longest-established Computer Science departments in the country. It is one of the UK's leading Computer Science Departments (ranked first in a number of international rankings). The UK Research Excellence Framework (REF) in December 2014 resulted in 74 members of the Department having 53% of their research activity ranked in the top category of 4* (world-leading). Overall, we received an average of 3.34 across the Department (3* being internationally excellent). A significant majority of the Department are active in externally sponsored research, with both government and industrial funding.

The Department has close links with government, industry, and other departments within the University. Among the latter are Mathematics, Engineering, Physics, Statistics and a number of life sciences departments. The Department is housed across multiple sites within the University's South Parks Road Science Area, facilitating strong collaborative links with research groups and institutes in closely allied areas (including the Oxford Internet Institute and the Oxford e-Research Centre). This is an essentially inter-disciplinary activity which is at present attracting major funding from a number of sources. At present, the Department holds over £50m in external research contracts.

Research in the Department is currently managed in ten themes:

- *Algorithms & Complexity Theory* focusses on determining the inherent difficulty of computational problems, classifying problems according to this inherent difficulty, and designing and analysing algorithms that use computational resources as efficiently as possible;
- *Artificial Intelligence & Machine Learning* focuses on theoretical foundations, multiagent systems, deep learning and computational linguistics;
- *Automated Verification* investigates theory and practice of formal verification and correct-by-construction synthesis for software and hardware systems;
- *Computational Biology & Health Informatics* is concerned with computational approaches for biomedical research and healthcare innovation;
- *Cyber-Physical Systems* is focusing on intelligent and autonomous sensor systems with applications in positioning, healthcare, environmental monitoring and smart cities;
- *Foundations, Structures and Quantum* embraces interdisciplinary research, and has a particular interest in structural foundations of quantum computation;
- *Human-Centred Computing* covers human-computer interaction, social computing and world-wide web;
- *Information Systems* covers databases, knowledge representation and reasoning;
- *Programming Languages* covers functional programming, program analysis, and programming language foundations;
- *Security* specialises in cybersecurity, protocol analysis, systems security, trusted computing, human-centred security, and networking.

For more information, please visit: <http://www.cs.ox.ac.uk/>.

The Mathematical, Physical, and Life Sciences Division (MPLS)

The Mathematical, Physical, and Life Sciences (MPLS) Division is one of the four academic divisions of the University. Oxford is widely recognised as one of the world's leading science universities and the MPLS Division is home to our non-medical sciences, with 10 academic departments that span the full spectrum of the mathematical, computational, physical, engineering and life sciences, and undertake both fundamental research and cutting-edge applied work. Our research tackles major societal and technological challenges – whether developing new energy solutions or improved cancer treatments, understanding climate change processes, or helping to preserve biodiversity, and is increasingly focused on key interdisciplinary issues. We collaborate closely with colleagues in Oxford across the medical sciences, social sciences and humanities, and with other universities, research organisations and industrial partners across the globe in pursuit of innovative research geared to address critical and fundamental scientific questions.

The disciplines within the MPLS Division regularly appear at the highest levels in world rankings, with Oxford's Mathematical, physical and life sciences research judged best in the country according to the 2014 REF assessment exercise carried out by the Higher Education Funding Council for England (HEFCE).

MPLS is proud to be the home of some of the most creative and innovative scientific thinkers and leaders working in academe. Our senior researchers have been awarded some of the most significant scientific honours and we have a strong tradition of attracting and nurturing the very best early career researchers who regularly secure prestigious fellowships and faculty positions. All academic departments in the Division also hold Athena Swan Awards, illustrating our commitment to ensure good practice and to encourage women in science at all levels in the division.

We have around 7,000 full and part-time students (including approximately 3,500 graduate students) and play a major role in training the next generation of leading scientists. Oxford's international reputation for excellence in teaching is reflected in its position at the top of the major league tables and subject assessments. MPLS academics educate students of high academic merit and potential from all over the world. Through a mixture of lectures, practical work and the distinctive college tutorial system, students develop their ability to solve diverse mathematical, scientific and engineering problems.

MPLS is dedicated to bringing the wonder and potential of science to the attention of audiences far beyond the world of academia. We have a strong commitment to supporting public engagement in science through initiatives including the Oxford Sparks portal (www.oxfordsparks.ox.ac.uk) and a large variety of outreach activities; these are crucial activities given so many societal and technological issues demand an understanding of the science that underpins them. We also bring the potential of our scientific efforts forward for practical and beneficial application to the real world and our desire, aided by the work of Oxford University Innovation and Oxford Sciences Innovation, is to link our best scientific minds with industry and public policy makers.

For more information about the MPLS division, please visit: www.mpls.ox.ac.uk

How to apply

Before submitting an application, you may find it helpful to read the 'Tips on applying for a job at the University of Oxford' document, at www.ox.ac.uk/about/jobs/supportandtechnical/.

If you would like to apply, click on the **Apply Now** button on the 'Job Details' page and follow the on-screen instructions to register as a new user or log-in if you have applied previously. Please provide details of two referees and indicate whether we can contact them now.

You will also be asked to upload a CV and a supporting statement. The supporting statement should explain how you meet the selection criteria for the post using examples of your skills and experience. This may include experience gained in employment, education, or during career breaks (such as time out to care for dependants).

Your application will be judged solely on the basis of how you demonstrate that you meet the selection criteria stated in the job description.

Please upload all documents **as PDF files** with your name and the document type in the filename.

All applications must be received by **midday** on the closing date stated in the online advertisement.

Information for priority candidates

A priority candidate is a University employee who is seeking redeployment because they have been advised that they are at risk of redundancy, or on grounds of ill-health/disability. Priority candidates are issued with a redeployment letter by their employing departments.

If you are a priority candidate, please ensure that you attach your redeployment letter to your application (or email it to the contact address on the advert if the application form used for the vacancy does not allow attachments)

Should you experience any difficulties using the online application system, please email recruitment.support@admin.ox.ac.uk. Further help and support is available from www.ox.ac.uk/about_the_university/jobs/support/. To return to the online application at any stage, please go to: www.recruit.ox.ac.uk.

Please note that you will be notified of the progress of your application by automatic emails from our e-recruitment system. **Please check your spam/junk mail** regularly to ensure that you receive all emails.

Important information for candidates

Pre-employment screening

Please note that the appointment of the successful candidate will be subject to standard pre-employment screening, as applicable to the post. This will include right-to-work, proof of identity and references. We advise all applicants to read the candidate notes on the University's pre-employment screening procedures, found at:

www.ox.ac.uk/about/jobs/preemploymentscreening/.

Data Privacy

Please note that any personal data submitted to the University as part of the job application process will be processed in accordance with the GDPR and related UK data protection legislation. For further information, please see the University's Privacy Notice for Job Applicants at: www.admin.ox.ac.uk/councilsec/compliance/gdpr/privacynotices/job/. The University's Policy on Data Protection is available at:

www.admin.ox.ac.uk/councilsec/compliance/gdpr/universitypolicyondataprotection/.

The University's policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for all academic posts and some academic-related posts. From 1 October 2017, the University has adopted an EJRA of 30 September before the 69th birthday for all academic and academic-related staff in posts at **grade 8 and above**. The justification for this is explained at:

www.admin.ox.ac.uk/personnel/end/retirement/acrelretire8+/.

For **existing** employees, any employment beyond the retirement age is subject to approval through the procedures: www.admin.ox.ac.uk/personnel/end/retirement/acrelretire8+/.

There is no normal or fixed age at which staff in posts at **grades 1–7** have to retire. Staff at these grades may elect to retire in accordance with the rules of the applicable pension scheme, as may be amended from time to time.

Equality of Opportunity

Entry into employment with the University and progression within employment will be determined only by personal merit and the application of criteria which are related to the duties of each particular post and the relevant salary structure. In all cases, ability to perform the job will be the primary consideration. No applicant or member of staff shall be discriminated against because of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or belief, sex, or sexual orientation.

Benefits of working at the University

University Club and sports facilities

Membership of the University Club is free for all University staff. The University Club provides social, sporting and hospitality facilities. Staff can also use the University Sports Centre on Iffley Road at discounted rates, including a fitness centre, powerlifting room, and

swimming pool. See www.club.ox.ac.uk and www.sport.ox.ac.uk/oxford-university-sports-facilities.

Information for international staff

The University offers support and advice to international staff, including a visa loan scheme to cover the costs of UK visa applications for staff and their dependents.

See www.admin.ox.ac.uk/personnel/permits/reimburse&loanscheme/.

Information for staff new to Oxford

If you are relocating to Oxfordshire from overseas or elsewhere in the UK, the University's Welcome Service website includes practical information about settling in the area, including advice on relocation, accommodation and local schools. See www.welcome.ox.ac.uk.

The University of Oxford Newcomers' Club

The University of Oxford Newcomers' Club is an organisation run by volunteers that aims to assist the partners of new staff to settle into Oxford and to provide them with an opportunity to meet people in the area. See www.newcomers.ox.ac.uk.

Childcare

The University has excellent childcare services with five University nurseries, as well as University-supported places at many other private nurseries.

For full details including how to apply and the costs, see www.admin.ox.ac.uk/childcare.

Family-friendly benefits

The University subscribes to My Family Care service through which staff are eligible to register for emergency back-up childcare and adultcare services, a 'speak to an expert' advice service and a wide range of guides and webinars through a website called the Work+Family space.

See: www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/mfc/.

Disabled staff

We are committed to supporting members of staff with disabilities or long-term health conditions. For further details, including information about how to make contact, in confidence, with the University's Staff Disability Advisor, see

www.admin.ox.ac.uk/eop/disab/staff.

Staff networks

The University has a number of staff networks including the Oxford Research Staff Society, BME staff network, LGBT+ staff network and a disabled staff network. You can find more information at www.admin.ox.ac.uk/eop/inpractice/networks/.

Additional benefits

Staff can enjoy a range of other benefits and discounts, including free entry to the Botanic Gardens and University colleges, and discounts at University museums.

See www.admin.ox.ac.uk/personnel/staffinfo/benefits.