

## Summary

<b>Job title</b>	Postdoctoral Research Assistant
<b>Division</b>	Medical Sciences Division
<b>Department</b>	Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences
<b>Location</b>	Botnar Institute for Musculoskeletal Sciences, Windmill Road, Oxford, OX3 7LD
<b>Grade and salary</b>	Grade 7: £36,024 – £42,978 per annum. If a suitable candidate cannot be found at Grade 7, a lower grade offer may be made (Grade 6: £32,332 – £38,205 p.a), with a commensurate reduction in responsibilities (and amendment in job title to Research Assistant).
<b>Hours</b>	Full time
<b>Contract type</b>	Fixed-term (6 months, funding available until 31/03/2025)
<b>Reporting to</b>	Prof Stephen Mellon
<b>Vacancy reference</b>	174001

<b>Research topic</b>	Infrastructure-free ultrasound reconstruction fusing image processing and deep inertial tracking
<b>Principal Investigator / supervisor</b>	Prof Stephen Mellon (primary) Prof Maurice Fallon (secondary)
<b>Project team</b>	Oxford Orthopaedic Engineering Centre and Oxford Robotics Institute
<b>Project web site</b>	<a href="https://www.ndorms.ox.ac.uk/research/research-groups/oxford-orthopaedic-engineering-centre">https://www.ndorms.ox.ac.uk/research/research-groups/oxford-orthopaedic-engineering-centre</a> <a href="http://ori.ox.ac.uk/drs">http://ori.ox.ac.uk/drs</a>
<b>Funding partner</b>	The funds supporting this research project are provided by UK Research and Innovation EPSRC IAA
<b>Recent publications</b>	



## **The role**

We are seeking a full-time Postdoctoral Research Assistant (PDRA) to join the Oxford Orthopaedic Engineering Centre (OOEC) at the Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences at the University of Oxford. The post is fixed-term for 6 months.

We have developed a 3D imaging and reconstruction system called CAT&MAUS (Computer-Aided Tracking & Motion Analysis with Ultrasound, which uses ultrasound imaging to improve the accuracy of optoelectronic motion capture (MOCAP) in human joint studies. With the support from the EPSRC, we are now working on a project to replace MOCAP with inertial measurement units (IMUs), computer vision and machine learning and to develop a compact, low-cost system which can be used for joint investigations in clinical environments. We seek a motivated researcher to join our interdisciplinary team of engineers and clinicians working on the development of a system for applications in clinical orthopaedics.

The successful candidate will test techniques commonly used in robotics, such as Simultaneous localisation and mapping (SLAM) and Visual Inertial Odometry Tracking (VIO) with the CAT&MAUS framework. They will assist with testing the system's accuracy for bone pose estimation.

Your work will be co-supervised by Prof Stephen Mellon (Botnar Institute) in collaboration with Prof Maurice Fallon (Oxford Robotics Institute). You will interact with other researchers, clinical professionals, and students working across the Botnar Institute and ORI.

## **Responsibilities**

### **Specific duties:**

- Design and conduct experiments to collect data on existing device performance in both laboratory and clinical settings
- Develop a method to add CAT&MAUS functionality to a clinical cart-based US device and repeat the above testing
- Maintain detailed documentation of research activities, protocols, and results. Ensure compliance with all ethical and regulatory requirements
- Devise a protocol for and then conduct user validation
- Act as a source of information and advice to other members of the group on methodologies or procedures
- Carry out collaborative research projects with colleagues in partner institutions and research groups
- Small-scale project management, to co-ordinate multiple aspects of work to meet deadlines

### **Additional duties:**

- Prepare and present research findings in internal meetings and external conferences.
- Contribute to the preparation of research papers, grant applications, and regulatory submissions
- Develop ideas for generating research income and present detailed research proposals to senior researchers
- Manage own academic research and administrative activities. This involves small scale project management, to co-ordinate multiple aspects of work to meet deadlines

## **Selection criteria**

### **Essential selection criteria**

- Doctorate degree (or near completion) in Biomedical Engineering or a related technical field.
- Experience with translational research and moving technologies from lab to clinical application, for example:
  - Prototype Development: Experience in developing and refining prototypes to meet clinical standards.
  - Regulatory Pathways: Understanding of regulatory processes and requirements for medical devices, including interactions with regulatory bodies
  - Technology Transfer: Experience in the processes of transferring technology from research institutions to commercial entities, including IP management and collaboration with industry partners.
- Knowledge of orthopaedic biomechanics and joint kinematics
- Experience in musculoskeletal modelling
- Excellent problem-solving skills and attention to detail.
- Ability to work independently and collaboratively within a multidisciplinary team.
- Excellent communication skills, including the ability to write for publication, present research proposals and results, and represent the research group at meetings
- Excellent IT skills

### **Desirable selection criteria**

- Track record of publications, preferably in biomedical engineering themed journals (or related fields)
- Experience of participating in accelerator programs
- Willingness to travel and work between institutions in Oxford and the UK
- Basic knowledge of machine learning
- Experience in developing and compiling software tools
- Experience with motion capture (i.e. VICON/OptiTrack/Qualisys)

## **Oxford Orthopaedic Engineering Centre**

The combined strengths of the Oxford Orthopaedic Engineering Centre (OOEC), NDORMS and the Department of Engineering Science (DES) offers an outstanding platform to develop and maintain high calibre research highly relevant to clinical issues. OOEC benefits from being situated within one of the country's foremost orthopaedic teaching hospitals, the Nuffield Orthopaedic Centre (NOC). OOEC combines cutting edge computational techniques with clinical data, to investigate joint mechanics and to improve medical device design. Our mission is to further the understanding of normal joint function, development of joint disease and optimise its treatment. We are committed to a common engineering foundation as well as to advanced work in individual specialities which include most branches of Orthopaedic Engineering. Strong links are maintained with clinicians, materials scientists, computational analysts and cell biologists, providing an outstanding research environment dedicated to excellence in the field of Orthopaedic Engineering.

## **Dynamic Robot Systems Group**

Dynamic Robot Systems Group (DRS) is one of the seven research groups of Oxford Robotics Institute. DRS focuses on navigation, motion planning, control and estimation for dynamic robots. DRS is led by Prof. Maurice Fallon and the group has a focus on robot navigation and mapping. The group is working on these topics in EU and UK funded projects with top research groups and companies in the field. The group has purpose-built test facilities within ORI's 300m<sup>2</sup> research centre and state of the art equipment such as the ANYmal quadruped robot (version C and D).

## **Pre-employment screening**

### **Standard checks**

If you are offered the post, the offer will be subject to standard pre-employment checks. You will be asked to provide: proof of your right-to-work in the UK; proof of your identity; and (if we haven't done so already) we will contact the referees you have nominated. You will also be asked to complete a health declaration so that you can tell us about any health conditions or disabilities for which you may need us to make appropriate adjustments.

Please read the candidate notes on the University's pre-employment screening procedures at: <https://www.jobs.ox.ac.uk/pre-employment-checks>

## **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 and we rank first in the UK for university spin-outs, and in recent years we have spun out 15-20 new companies every year. 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](http://www.ox.ac.uk/about/organisation).

### **Medical Sciences Division**

The Medical Sciences Division is an internationally recognised centre of excellence for biomedical and clinical research and teaching. We are the largest academic division in the University of Oxford.

World-leading programmes, housed in state-of-the-art facilities, cover the full range of scientific endeavour from the molecule to the population. With our NHS partners we also foster the highest possible standards in patient care.

For more information please visit: [www.medsci.ox.ac.uk](http://www.medsci.ox.ac.uk)

## **Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences**

The Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences (NDORMS) is part of the Medical Sciences Division and is the largest European academic department in its field, running a globally competitive programme of research and teaching.

Our mission is to discover the causes of musculoskeletal and inflammatory conditions to deliver excellent and innovative care that improves people's quality of life. Our highly skilled teams have expertise in a broad range of areas, including orthopaedic surgery, inflammation, immunology, rheumatology, medical statistics, epidemiology, and clinical trials.

We currently have 480 staff, approximately 120 post-graduate students and have a grant portfolio worth over £180 million.

The **Botnar Research Centre** enables and encourages research and education into the causes of musculoskeletal disease and their treatment. The Centre provides world-class facilities for scientists in the field of musculoskeletal research. It takes a multidisciplinary approach, encompassing orthopaedic, rehabilitation and rheumatology clinical scientists, bone oncologists, laboratory scientists, epidemiologists, engineers and statisticians. The Botnar also hosts the Oxford Clinical Trials Research Unit (OCTRU) and the Centre of Statistics in Medicine (CSM), providing excellent statistical support to all aspects of clinical research.



The Botnar opened in 2002, with a large annex completed in 2013. The Botnar is now home to around 300 staff and postgraduate students enjoying the international and friendly atmosphere of this workplace and benefits from the vast knowledge of leading experts in the field of musculoskeletal research.

To accommodate its rapid growth, the Centre has opened another wing in early 2022. The new space provides additional 1000m<sup>2</sup> of office and 1000m<sup>2</sup> of laboratory space. The laboratory space includes a GMP clean room facility suitable for the manufacturing of biomaterials for human implantation.

Sharing the site of the Nuffield Orthopaedic Centre, the largest specialist academic musculoskeletal hospital in the UK, puts the Botnar in a unique position to foster the collaboration between basic scientists and clinicians, which is essential to success in medical research.

The **Oxford Robotics Institute (ORI)** is an independent institute within the Department of Engineering Science. We are built from collaborating and integrated groups of researchers, engineers, and students all driven to change what robots can do for us. Our current interests are diverse – from flying to grasping, from inspection to running, from haptics to driving, from exploring to planning. We are the only group in the UK that specialises in large-scale mobile autonomy - both indoors and outdoors. We validate our thinking and challenge ourselves by fielding robotic systems in real application environments.

### Athena Swan

The [Athena SWAN Awards](#) specifically recognise success in developing employment practices to further and support the careers of women in science, technology, engineering, maths and medicine (STEMM) departments in academia. In May 2015 the charter was expanded to recognise work undertaken in arts, humanities, social sciences, business and law (AHSSBL), and in professional and support roles. Within NDORMS, we feel that we have an established culture of equality but are using the process to spur on-going improvement that benefits everyone involved in the Department. Our on-going progress was rewarded in May 2014 with an Athena Swan Bronze Award and in October 2015 with a Silver Award.

Our development in this area has resulted in a number of commitments to our staff, central to which are:

- establishing an open, supportive and family-friendly research environment
- supporting career progression through teaching programmes, personal development reviews and mentoring
- proactive communication of support policies such as flexible working, provision of leave, promotion and career support schemes

NDORMS aims to actively promote the implementation of the University's family-friendly policies to help foster a family friendly working environment, including provision of family leave (such as policies for maternity, paternity, parental, carers and adoption leave), flexible/part-time working and scheduling inclusive meetings.

The University's childcare services support staff with a Childcare Voucher Scheme to help staff save tax and national insurance on childcare costs, offer information on nursery providers and a nursery fee Salary Sacrifice Scheme, work in partnership with playscheme providers to help support families during school holidays and signpost staff to parenting, local authority and other organisations that help support families and parents.

The Department is also committed to ensuring that staff undertaking part-time or flexible working receive the same access to benefits and entitlements as full-time staff, including the same opportunities for training and promotion, a pro-rata entitlement to leave including bank holidays and careful consideration of requests to work part-time (particularly for those by staff returning from maternity leave).

For more information please visit: <http://www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/> and <http://www.admin.ox.ac.uk/personnel/during/flexible/>

We are also actively working to uphold the University's aim of providing an inclusive environment and equal career opportunities by promoting equality, valuing diversity and maintaining a working, learning and social environment in which the rights and dignity of all staff are respected. Separate

University policies are also in place to ensure race, disability and gender equality. For more information, please visit: <http://www.admin.ox.ac.uk/eop/>

## How to apply

Applications are made through our online recruitment portal. Information about how to apply is available on our Jobs website <https://www.jobs.ox.ac.uk/how-to-apply>.

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

As part of your application you will be asked to provide details of two referees and indicate whether we can contact them now.

You will be asked to upload a CV and a supporting statement. The supporting statement must explain how you meet each of 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)

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

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

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## 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 department(s).

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).

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## If you need help

Application FAQs, including technical troubleshooting advice is available at: <https://staff.web.ox.ac.uk/recruitment-support-faqs>

Non-technical questions about this job should be addressed to the recruiting department directly: [hr@ndorms.ox.ac.uk](mailto:hr@ndorms.ox.ac.uk)

To return to the online application at any stage, please go to: [www.recruit.ox.ac.uk](http://www.recruit.ox.ac.uk).

Please note that you will receive an automated email from our online recruitment portal to confirm receipt of your application. **Please check your spam/junk mail** if you do not receive this email.



## Important information for candidates

### 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: <https://compliance.admin.ox.ac.uk/job-applicant-privacy-policy>. The University's Policy on Data Protection is available at: <https://compliance.admin.ox.ac.uk/data-protection-policy>.

### The University's policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for very senior research posts at **grade RSIV/D35 and clinical equivalents E62 and E82**, which with effect from 1 October 2023 will be 30 September before the 70<sup>th</sup> birthday. The justification for this is explained at: <https://hr.admin.ox.ac.uk/the-ejra>.

For **existing** employees on these grades, any employment beyond the retirement age is subject to approval through the procedures: <https://hr.admin.ox.ac.uk/the-ejra>.

There is no normal or fixed age at which staff in posts at other grades 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

## Employee benefits

University employees enjoy 38 days' paid holiday, generous pension schemes, travel discounts, and a variety of professional development opportunities. Our range of other employee benefits and discounts also includes free entry to the Botanic Gardens and University colleges, and discounts at University museums. See <https://hr.admin.ox.ac.uk/staff-benefits>

## University Club and sports facilities

Membership of the University Club is free for all University staff. The University Club offers 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](http://www.club.ox.ac.uk) and <https://www.sport.ox.ac.uk/>.

## 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 <https://welcome.ox.ac.uk/>  
There is also a visa loan scheme to cover the costs of UK visa applications for staff and their dependents. See <https://staffimmigration.admin.ox.ac.uk/visa-loan-scheme>

## Family-friendly benefits

With one of the most generous family leave schemes in the Higher Education sector, and a range of flexible working options, Oxford aims to be a family-friendly employer. We also subscribe to the Work+Family Space, a service that provides practical advice and support for employees who have caring responsibilities. The service offers a free telephone advice line, and the ability to book emergency back-up care for children, adult dependents and elderly relatives. See <https://hr.admin.ox.ac.uk/my-family-care>

The University has excellent childcare services, including 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 <https://childcare.admin.ox.ac.uk/>

## 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 <https://edu.admin.ox.ac.uk/disability-support>

## 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 <https://edu.admin.ox.ac.uk/networks>

## 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 settle into Oxford, and provides them with an opportunity to meet people and make connections in the local area. See [www.newcomers.ox.ac.uk](http://www.newcomers.ox.ac.uk).