University of Oxford Department of Computer Science

# Job description and selection criteria

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| **Job title** | Two Research Fellowships in Statistical/Mathematical / Computational Modelling |
| **Division** | MPLS |
| **Department** | Computer Science |
| **Location** | Wolfson Building, Parks Road, Oxford. |
| **Grade and salary** | Grade 7: Salary £29,249-£35,938 p.a. |
| **Hours** | 37.5 |
| **Contract type** | Fixed term contract for up to 2 years |
| **Reporting to** | Prof. David Gavaghan |

## Introduction

### The University

The University of Oxford is a complex and stimulating organisation, which enjoys an international reputation as a world-class centre of excellence in research and teaching. It employs over 10,000 staff and has a student population of over 21,000.

Most staff are directly appointed and managed by one of the University's 130 departments or other units within a highly devolved operational structure - this includes 5,900 'academic-related' staff (postgraduate research, computing, senior library, and administrative staff) and 2,820 'support' staff (including clerical, library, technical, and manual staff). There are also over 1,600 academic staff (professors, readers, lecturers), whose appointments are in the main overseen by a combination of broader divisional and local faculty board/departmental structures. Academics are generally all also employed by one of the 38 constituent colleges of the University as well as by the central University itself.

Our annual income in 2009/10 was £879.8m. Oxford is one of Europe's most innovative and entrepreneurial universities: income from external research contracts exceeds £367m p.a., and more than 60 spin-off companies have been created.

For more information please visit www.ox.ac.uk

### MPLS Division

The academic administration of the University is conducted through four divisions (Humanities, Social Sciences, Mathematical, Physical and Life Sciences, and Medical Sciences). The Mathematical, Physical and Life Sciences Division consists of ten constituent departments: the Department of Chemistry, Department of Computer Science, the Department of Earth Sciences, the Department of Engineering Science, the Department of Materials, Mathematical Institute, the Department of Physics, Department of Plant Sciences, Department of Zoology and Statistics. The division provides a framework for interdisciplinary teaching and research. There are also links with the Medical Sciences Division.

For more information please visit: http://www.mpls.ox.ac.uk/

### Department of Computer Science

The Department of Computer Science, University of Oxford has one of the longest-established Computer Science departments in the country. Formerly known as the Oxford University Computing Laboratory, it is home to a community of world-class research and teaching. Research activities encompass core Computer Science, as well as computational biology, quantum computing, computational linguistics, information systems, software verification and software engineering. The department is home to undergraduates, full-time and part-time Master's students, and has a strong doctoral programme.

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

## Job description

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| **Research topic** | Statistical/ Mathematical / Computational Modelling |
| **Principal Investigator / supervisor** | Professor David Gavaghan |
| **Funding partner** | EPSRC and Microsoft Research Cambridge |

### Overview

The University of Oxford, University College London and Microsoft Research, Cambridge have received funding from the EPSRC Cross-Disciplinary Interfaces Programme (C-DIP) for a programme of research that will involve up to 17 post-doctoral fellowships over a five year period. The 2020 Science programme is focused on fostering the creation of a new generation of future scientific leaders – new kinds of scientists with the ability to lead the way in tackling fundamental challenges in science in areas of societal importance. At the heart of the programme is the development and application of computational tools and novel approaches to the scientific computing, scientific software development and software engineering that underpin the development of predictive models of complex, multi-scale natural systems.

These two appointments will be based at the University of Oxford. However, our collaborators at University College London will also be recruiting two research fellows to work within the 2020 Science programme. *Candidates are asked to carefully consider their application and encouraged to only apply to one institution.* It is expected that all fellows will

work with colleagues across the programme, including those based at Microsoft Research in Cambridge. Appointments will be for up to 2 years.

The emphasis of the 2020 Science programme is on producing a new generation of highly computational natural scientists and tool builders able to apply novel approaches to tackle fundamental problems in natural science. The scientific remit of the programme is broad, covering a wide range of challenging problems in the computational modelling of naturally occurring systems. Research problems will be deemed to be within the scientific remit of the programme both on their own merit as important scientific questions, but also by the degree to which it is necessary to address pressing generic problems in computational science. Throughout, a dominant emphasis will be on developing a new generation of modelling approaches and models, especially multi-scale and systems modelling encompassing discrete, continuous, stochastic, deterministic and hybrid approaches.

The 2020 Science programme is currently investigating several broad research themes:

1. Immunology
2. Multi-cell systems
3. Vascular modelling
4. Functional curation
5. Computational ecology and environmental science

While we will accept applications which conform to the scientific remit outlined above, we are particularly interested in applicants with experience in the following areas:

- Statistics, specifically looking at model selection and validation against experimental data
- Cell-centric modelling, particularly taking novel approaches to modelling cells as information processing and decision making entities

One of the major aims of the 2020 Science programme is to support the development of early career researchers to allow them to make the transition to independent researchers in either academia or industry. Each Research Fellow will receive training in state-of-the-art approaches to computational science whilst also conducting cutting edge life science research in a specific domain. Each fellow will be allocated a mentor, who will work with them to support their career progression. Every effort will be made to provide fellows with teaching opportunities (especially outside their core discipline) and the research skills necessary to forge a successful career across disciplines. Support will also be available for travel to international and national meetings, and between the partner organisations.

Further information on the 2020 Science programme and its scientific remit can be found at www.2020science.net

## Duties/ Responsibilities

The postholder will carry out research as a member of the University of Oxford, based in one of the Departments associated with the programme (determined by the science), and as such be responsible to the Principal Investigators of the 2020 Science Programme. The successful candidate will also interact with our collaborative partners, including other Research Fellowship holders at University College London and Microsoft Research Laboratory, Cambridge.

Duties/Responsibilities:

- Undertake research of a theoretical, computational or experimental nature (as appropriate) aimed at advancing the understanding of complex natural systems.

- Prepare research papers for publication in top scientific journals.

- Present individual and group research at leading workshops and conferences.

- Participate in regular meetings with colleagues at University College London, University of Oxford and Microsoft Research, to include the reporting of results from the work being conducted at Oxford.

- Assist with the supervision of postgraduate students working on related projects within the 2020 Science programme.

- Collaborate with other researchers and post-graduate students within the programme to promote best practise in software engineering and the development of a wide range of relevant research domains.

- The postholder will carry out any other duties as are within the scope, spirit and purpose of the job as requested by their line manager or the Principal Investigators.

**Oxford University**
**Selection Criteria**

**Essential**

- A PhD in a relevant area of science must be in place prior to 1 October 2012
- A documented track record of the ability to conduct and complete research projects, as witnessed by published peer-reviewed work (according to experience of the candidate)
- Evidence of research independence and creativity
- Research experience of statistical/ mathematical / computational modelling of complex natural systems (broadly defined to include biology, medicine, ecology etc.)
- Potential to work as a highly motivated, independent research fellow who will develop an outstanding research career
- A genuine interest in the aims of the 2020 Science research programme
- Potential to provide scientific leadership and supervision within the programme
- Ability to work in a team
- Good verbal and written communication skills in English

**Desirable**

- Strong software development/engineering skills
- Experience of multidisciplinary research settings
- Demonstrated ability to make clear, well-illustrated scientific presentations
- Experience of teaching/training in mathematical and computational modelling

## Working at the University of Oxford

For further information about working at Oxford, please see:

http://www.ox.ac.uk/about_the_university/jobs/research/

**Salary and Benefits**

The post, which is a fixed term appointment for up to three years (with the possibility of extension for a further 2 years), has a salary on the University grade 07S scale (currently £29,249-£35,938 p.a.), includes membership of the University Superannuation Scheme (USS) and has an annual leave entitlement of 38 days per year (inclusive of all public holidays and university closed periods).

## How to apply

If you consider that you meet the selection criteria, click on the **Apply Now** button on the 'Job Details' page and follow the on-screen instructions to register as a user. You will then be required to complete a number of screens with your application details, relating to your skills and experience. When prompted, please provide details of two referees and indicate whether we can contact them at this stage. You will also be required to upload a CV and supporting statement. The supporting statement should describe what you have been doing over at least the last 10 years. This may have been employment, education, or you may have taken time away from these activities in order to raise a family, care for a dependant, or travel for example. Your application will be judged solely on the basis of how you demonstrate that that you meet the selection criteria outlined above and we are happy to consider evidence of transferable skills or experience which you may have gained outside the context of paid employment or education.

Please save all uploaded documents to show your name and the document type.

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

Candidates must also ask their referees to consider this job description and email their reference directly to **job26@cs.ox.ac.uk** or, alternatively, post or fax it to: The Administrator, Department of Computer Science, Wolfson Building, Parks Road, Oxford OX1 3QD, such that the reference arrives by, or shortly after, the advertised closing date.

Should you experience any difficulties using the online application system, please email recruitment.support@admin.ox.ac.uk

To return to the online application at any stage, please click on the following link www.recruit.ox.ac.uk

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

Potential candidates are welcome to contact one of the following persons to informally discuss their research and its potential fit with the 2020 Science programme before making a formal application.

- Statistics: Chris Holmes (c.holmes@stats.ox.ac.uk) or Charlotte Deane (deane@stats.ox.ac.uk)
- Cell-centric modelling: Stephen Emmott (semmott@microsoft.com)
- Other areas: David Gavaghan (david.gavaghan@cs.ox.ac.uk)