



University of Oxford Department of Computer Science

## Job description and selection criteria

<b>Job title</b>	Global Cyber Security Capacity Centre Research Fellow
<b>Division</b>	MPLS
<b>Department</b>	GCSCC with Computer Science
<b>Location</b>	Oxford Martin School, Broad Street, Oxford
<b>Grade and salary</b>	Grade 8: Salary £38,511– £45,954 p.a.
<b>Hours</b>	Full Time
<b>Contract type</b>	Fixed term until 31 <sup>st</sup> March 2016
<b>Reporting to</b>	Professor Michael Goldsmith
<b>Vacancy reference</b>	118201

## 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 22,000.

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 over 6,500 'academic-related' staff (postgraduate research, computing, senior library, and administrative staff) and over 2,700 '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 2012/13 was £1,086.9m. Oxford is one of Europe's most innovative and entrepreneurial universities: income from external research contracts exceeds £436.8m p.a., and more than 80 spin-off companies have been created.

For more information please visit [www.ox.ac.uk/staff/about\\_the\\_university.html](http://www.ox.ac.uk/staff/about_the_university.html)

## **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. The disciplines within the MPLS Division regularly appear at the highest levels in world rankings. In the results of the six-yearly UK-wide assessment of university research, REF2014, the MPLS division received the highest overall grade point average (GPA) and the highest GPA for outputs. We received the highest proportion of 4\* outputs, and the highest proportion of 4\* activity overall. More than 50 per cent of MPLS activity was assessed as world leading.

The MPLS Division's 10 departments and 3 interdisciplinary units 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 addresses major societal and technological challenges 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.

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 (including Nobel prizes and prestigious titles such as FRS and FR.Eng) and we have a strong tradition of attracting and nurturing the very best early career researchers who regularly secure prestigious fellowships. The Division is also the proud holder of eight Athena Swan Awards (4 Silver and 4 Bronze) illustrating our commitment to ensure good practice and to encourage women in science at all levels in the division.

We have around 6,000 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 major 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 (<http://www.oxfordsparks.net/>) 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 endeavour to bring the potential of our scientific efforts forward for practical and beneficial application to the real world and our desire is to link our best scientific minds with industry and public policy makers.

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

## The 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 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. At present there are 69 members of academic staff and almost 100 research staff.

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 seven themes:

- *Programming Languages and Software Engineering* (led by Professor Jeremy Gibbons, and including Professor Jim Davies) works on a wide variety of areas including model-driven development, functional programming, and static analysis;
- *Security* (led by Professor Bill Roscoe) specialises in cybersecurity (Professor Sadie Creese leads a new Cybersecurity Centre), protocol analysis, trusted computing, networking, and human-centred computing;
- *Automated Verification* (led by Professor Marta Kwiatkowska) covers probabilistic and software model checking (Professor Daniel Kroening), time and concurrency (Professor Joel Ouaknine, Professor James Worrell, and Professors Roscoe and Lowe), and hardware (Professor Tom Melham);
- *Computational Biology* (led by Professor David Gavaghan, and including Professors Kevin Burrage, Helen Byrne, and Blanca Rodriguez) is one of the world's leading groups building computational models of biological systems, and is particularly well-known for its work on the heart;
- *Foundations, Logic and Structures*, (leader Professor Samson Abramsky) which includes groups working on quantum information and computation (Professors Samson Abramsky and Bob Coecke), game semantics and verification (Professor Luke Ong), and constraints (Professor Peter Jeavons);
- *Information Systems* (led by Professor Ian Horrocks, and including Professors Michael Benedikt, Nando de Freitas, Boris Motik, Georg Gottlob, and Michael Wooldridge) has groups working on databases, knowledge representation and reasoning, multi-agent systems, and computational linguistics (Professor Stephen Pulman);
- *Algorithms* (led by Professor Leslie Ann Goldberg, and including Professors Paul Goldberg and Elias Koutsoupias) covering computational complexity, algorithmic game theory, and constraint satisfaction.

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

## Job description

<b>Research topic</b>	Cybersecurity Capacity Building
<b>Principal Investigator / supervisor</b>	Professor Sadie Creese – Cybersecurity Centre Director
<b>Project web site</b>	<a href="https://www.cybersecurity.ox.ac.uk/research/global-security-cyber-capacity">https://www.cybersecurity.ox.ac.uk/research/global-security-cyber-capacity</a>

### Overview of the role

The Cybersecurity Group at the Department of Computer Science is looking to employ a Research Fellow to work in a UK Government-funded collaborative research centre on cyber-security capacity-building. The Centre will be located at the Oxford Martin School, which specialises in supporting interdisciplinary research communities working to address the most pressing global challenges and opportunities of the 21st century. The Centre's aim is to understand and communicate how best to deliver effective cyber security both within the UK and across the world. We will make this knowledge available to governments, communities and organisations to underpin an increase of their capacity in ways appropriate to ensuring a cyber space which can continue to grow and innovate in support of well-being, human rights and prosperity for all.

This is an exciting opportunity for an experienced researcher with a strong methodological and/or theoretical background in one of the social sciences or physical sciences or humanities, for example economics, political science, computer science, philosophy, cognitive or social psychology, law, geography, anthropology, international relations, development or sociology; and with an interest in research which matches one or more of the Centre's dimensions of capacity.

The key focus of this post will be to support the research programme of the Global Cyber Security Capacity Centre and its operationalisation on an international scale. The Centre has developed a new model to measure cyber security maturity and is working with the international community to apply the model across the world. An essential aspect of this post will be to work closely with high-level stakeholders in governments, regional and international organisations, academia and industry to promote and develop this work.

The Centre's research focuses on five dimensions of capacity-building:

- National and international policy, and our ability effectively to deter and to defend against cyber- attacks.
- Society, culture and the susceptibility of people to cyber crime, and their views on what is acceptable in terms of apportioning responsibility for cyber risk and the use of cyber-security tools.
- The availability of a high-quality cyber-security-skilled workforce and leadership, across the public, private and voluntary sectors, and the underpinning educational and training platforms required to develop and support them.
- The legal and regulatory environments at large and their ability to stimulate good cyber-security practice and generally to increase the resilience of cyber space and the people and organisations dependent upon it.

- Availability and use of technology, processes, business models and standards to support control of cyber risk in the home, in the enterprise, across national critical infrastructures and across international cyberspace.

More details about the Global Cyber Security Capacity Centre can be found at its website: [www.oxfordmartin.ox.ac.uk/cybersecurity](http://www.oxfordmartin.ox.ac.uk/cybersecurity) and on its online portal at <http://www.sbs.ox.ac.uk/cybersecurity-capacity/explore/home>.

The successful applicant will be based in the Oxford Martin School in Central Oxford. The School is a unique interdisciplinary community within the University of Oxford, fostering innovative thinking, deep scholarship and collaborative activity to address the most pressing risks and realise new opportunities of the 21st century. It was founded in 2005 through the vision and generosity of James Martin. It works across the University's four academic divisions and currently comprises over 35 interdisciplinary research programmes on global future challenges, clustered under four broad themes of: Energy & Environment; Health & Medicine; Technology & Society; and Ethics & Governance.

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

The successful applicant will join an existing team working closely with Centre Director Professor Sadie Creese and the other senior academics, and will be both a staff member of the Department of Computer Science, and an Oxford Martin Fellow. Depending upon their particular area of expertise, the post holder will be expected to focus on supporting two dimensions of the Centre's work along with the senior academics directing those dimensions, but they must also be prepared to work across all dimensions and beyond as required.

This role necessarily requires interdisciplinary collaboration with all the senior academics, who originate from the Saïd Business School (Prof Upton), Oxford Internet Institute (Prof Brown), Computer Science Department (Prof Creese, Prof Goldsmith) at the University of Oxford; and also Prof Dutton of Michigan State University, Prof Sasse of UCL, Prof Cornish of RAND Europe, Prof Toft of Boston University, Prof Mitchell of Royal Holloway University of London and Prof von Solms of the University of Johannesburg. These academics form the leadership (the Technical Board) of the Centre. Applicants must therefore be keen to work as part of a collaborative team, be exceptionally able to deal with change and to learn about areas of cyber security not immediately within their domain of expertise, and be keen and able to travel.

## Main Duties and Responsibilities

The main duties of the successful candidate will include:

- To take responsibility for the execution of the research plan as defined in the description of work and as evolved by the Technical Board - working with key stakeholders to promote the thinking of the centre and the adoption of its capacity maturity model.

This will include:

- Identification of global cyber-security capacity-building expertise.
  - Co-ordination of primary data collection exercises and fieldwork.
  - Working with partners and key stakeholders to promote a collaborative approach and uptake of the Centre's products.
  - Influencing and gaining the trust of internal and external partners in order to build and use extensive networks.
  - Development of written examples and case studies of cyber-security capacity-building experience.
  - Further evolution of the cyber-security capacity capability maturity model with particular focus on two specific dimensions but also with consideration of the whole.
  - Assisting in the development of a novel model for assessing cyber-security harm against nations
  - Supporting the convening of meetings of senior academics and members of the advisory board of the Centre, synthesising the ideas and knowledge generated within the research plan.
  - Developing knowledge-exchange resources in the form of written documents, downloadable media, and other content for the Centre's website and online portal
  - Helping to provide the Portal Manager with material for dissemination
- To provide world-leading expertise in the area of cyber-security capacity-building through a proven track record of research in one of more of the dimensions of focus for the Centre.
  - To work with the Knowledge Exchange Programme Manager to help develop and deliver a global programme of enhanced engagement, to facilitate the upscaling of the Centre's reach and influence and showcase the products of its research.
  - To work with related teams (subject to funding) broadening the applicability of the Capability Maturity and Harm models to large and small commercial organisations
  - To build the profile of the Centre through public engagements and publications as appropriate.
  - To present results at international conferences, meetings with international stakeholders and grant review meetings; considerable travel may be required.
  - To participate actively in the Centre's programme of seminars and events, including those aimed at non-academic audiences.
  - To help direct students and interns who are associated with the project by setting goals and managing the resources available.
  - To participate in Centre administration, as required.
  - To develop and implement new research methodologies and materials.
  - To develop research questions within a specific context, to conduct individual research, analysing detailed and complex qualitative and/or quantitative data from a variety of sources, and to generate original ideas by building on existing concepts.
  - To share responsibility for shaping the Centre's plans and the writing of funding applications as part of sustainability-planning exercises.

## **Selection Criteria**

### **Essential:**

- Hold a relevant Ph.D/D.Phil with post-qualification research experience
- Theoretical and methodological grounding in one or more disciplines relevant to the dimensions of cyber-security capacity being studied by the Centre;
- A distinguished research record in a relevant area with publication of articles in high-impact refereed journals;
- Ability and willingness to address high-level influential audiences with authority;
- Sufficient specialist knowledge in their discipline to develop research projects and methodologies;
- An excellent track record of methodologically or theoretically innovative research;
- Proven interpersonal skills and the ability to interact effectively and confidentially with senior decision-makers and high-level partners;
- Outstanding communication and writing skills, with the ability to disseminate results of research to a variety of audiences and to frame recommendations at a national policy level;
- Excellent influencing skills and the commercial awareness necessary to develop existing and build new key stakeholder relationships and networks within the UK and internationally.
- Ability to take a proactive, enthusiastic and flexible approach to delivery, and to utilise new opportunities as they arise.
- Proven ability to think laterally and creatively, with the drive and initiative to work both independently and with the Centre's research team to maximise effectiveness
- Proven ability to work effectively with colleagues as part of a professional team;
- Willingness to participate in collaborative, multi-disciplinary research projects;
- Experience of research-planning and organisation;

### **Desirable:**

- Experience of cyber-security capacity-building activities;
- Experience of multi-disciplinary working;
- Proven ability to teach and supervise postgraduate students and undergraduate projects;
- A track record of writing successful applications for research funding.

## Salary and Benefits

The post is a full time appointment, is available to start immediately and will finish on 31 March 2016. The position has a salary on the University grade 08S scale (currently £38,511 to £45,954). This 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).

## Summary of the University's Equal Opportunities Policy

The policy and practice of the University of Oxford require that all staff are afforded equal opportunities within employment. 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. Subject to statutory provisions, no applicant or member of staff will be treated less favourably than another because of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or belief, sex, or sexual orientation.

## Working at the University of Oxford

For further information about working at Oxford, please see:

[www.ox.ac.uk/about\\_the\\_university/jobs/research/](http://www.ox.ac.uk/about_the_university/jobs/research/)

## 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 three referees (one of which must include your current or most recent employer), 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 setting out how the candidate meets the selection criteria and indicating which of the capacity dimensions they feel particularly able to support and work within. It should also include any rationale for gaps in employment/study. 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.

Should you experience any difficulties using the online application system, please email [recruitment.support@admin.ox.ac.uk](mailto: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](http://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.