University of Oxford Department of Computer Science

Job description and selection criteria

Job title	Software Developer
Division	MPLS
Department	Computer Science
Location	Wolfson Building/Robert Hooke Building, Parks Road, Oxford.
Grade and salary	Grade 8: Salary £37,382-£44,607 p.a., with a discretionary range to £48,729
Hours	Full Time
Contract type	Fixed term contract initially for 10 months
Reporting to	Professor Sadie Creese and Professor Michael Goldsmith

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 Mathematical, Physical, and Life Sciences Division (MPLS) is one of the four academic divisions of the University.

Oxford is widely recognised as one of the world's leading science universities. In the 2008 UK Research Assessment Exercise over 70% of research activity in MPLS was judged to be world-leading (4*) or internationally excellent (3*), and Oxford was ranked first in the UK across the mathematical sciences as a whole.

The MPLS division's ten departments and three 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. We have over 6,000 students and research staff, and generate over half of our funding from external research grants. Our research addresses major societal and technological challenges and is increasingly interdisciplinary in nature. We collaborate closely with colleagues in Oxford across the medical sciences, social sciences and humanities, as well as with researchers from around the world.

For more information, please visit:

http://www.mpls.ox.ac.uk/

Department of Computer Science

The Department of Computer Science (DoCS) was established in 1957. It is one of the UK's leading Computer Science Departments (ranked first in a number of newspaper rankings, and third in terms of research power). In the RAE in 2008, 80% of the submitted research was found to be in the top two tiers, either 4* (world-leading) or 3* (internationally excellent). Many members of the Department are active in externally sponsored research, with both government and industrial funding. At present there are 52 members of academic staff and over 80 research staff.

DoCS 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. It has a major role in the rapidly-developing field of e-Science alongside the Oxford e-Research Centre, an independent unit with which we share a building. This is an essentially inter-disciplinary activity which is at present attracting major funding from a number of sources. At present DoCS holds £37m in external research contracts.

Research in DoCS is currently managed in seven themes. *Software Engineering* (led by Professor Jim Davies), works on a wide variety of areas including e-Science and model-driven development; *Programming Languages* (led by Professor Jeremy Gibbons and including Dr Ralf Hinze and Professor Oege de Moor); Security (leader Professor Bill Roscoe, with Professor Sadie Creese leading a new Cyber Security Centre, and Professor Gavin Lowe); *Verification* (leader Professor Marta Kwiatkowska) covering probabilistic and software model checking (Professor Daniel Kroening) with time and concurrency (Professor Joel Ouaknine, Professor James Worrell, and Professors Roscoe and Lowe), and automated verification of hardware (Professor Tom Melham); *Computational Biology* (led by Professor David Gavaghan and including Professors Kevin Burrage and Helen Byrne) 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; and *Foundations, Logic and Structures*, (leader, Professor Samson Abramsky) which includes groups working on quantum information and computation (Abramsky and Professor Bob Coecke), game semantics and verification (Professor Luke Ong) and constraints (Professor Peter Jeavons); *Information Systems* (jointly led by Professors Georg Gottlob and Ian Horrocks and including Professor Stephen Pulman, who works on Computational Linguistics, and Professor Michael Benedikt). In addition the department has recently recruited Professors Mike Wooldridge (Agent Based Systems) and Elias Koutsoupias (Algorithms). A realignment of the themes is expected shortly.

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

Job description

Research topic	Software Developer for CyberVis – mapping potential impact of network incidents onto business processes
Principal Investigator / supervisor	Professor Sadie Creese and Professor Michael Goldsmith
Funding partner	DSTL via Northrop Grumman Mission Systems Europe Ltd

Overview of the role

The Cybersecurity Group in the Department of Computer Science are looking to employ an experienced software developer to work on a collaborative research project on enhanced situational awareness and decision support for cyber defence, in collaboration with Northrop Grumman Mission Systems Europe Ltd and the University of Glamorgan, funded by the UK Defence Science and Technology Laboratory. The Oxford tool, CyberVis, concentrates on mapping the potential impact of network incidents onto business processes and onto human assets.

This post will primarily be responsible for evolving the code-base of the CyberVis tool and restructuring and optimising the associated databases. The successful applicant will join a team of three other researchers, based in the Department of Computer Science at the University of Oxford, and will be a member of the recently formed Cyber Security Centre, working closely with Professor Sadie Creese and Professor Michael Goldsmith.

Applicants should have a strong background in software development, excellent Java skills and experience of working as part of a team. Knowledge of relational databases and XML are essential, as is a working knowledge of computer networks and network technologies. The ideal candidate would also have experience of application development using Spring and Hibernate, knowledge of JOGL/OpenGL, together with experience of Subversion and Git, Hadoop/Hive, SOAP and MySQL. A relevant doctorate and post-doctoral experience, allowing the candidate to contribute to the wider research agenda, would be welcomed.

Responsibilities/duties

The main duties of the successful candidate will include:

- To take responsibility for the evolution of the CyberVis code-base and the associated databases in line with the Department's commitments in the project proposal and in consultation with the Principal Investigators and other members of the project team;
- To interact with the other members of the project team and with staff at partner organisations;
- To help develop data sets for testing and demonstration purposes.
- To direct junior researchers and doctoral or undergraduate project students who may be associated with software aspects of the project by setting goals and managing the resources available;
- Where appropriate, to present results at international conferences and project review meetings;
- Where appropriate, to write publications to the standard of internationally leading venues;
- Where appropriate, to share responsibility for shaping the wider research group's plans and for writing group-funding applications for new research projects.
- The post-holder may have the opportunity to teach. This may include lecturing, small-group teaching, and tutoring of undergraduates and graduate students.

Selection Criteria

Essential:

- A strong background in software development, including excellent Java programming skills;
- Experience of working as part of a team;
- Experience of independent task-planning, organisation, communication and writing skills;
- Knowledge of relational databases and XML;
- A working knowledge of computer networks and network technologies;
- A proven experience of working collaboratively both with academic and with industry partners.

Desirable:

- Experience of developing applications using Spring and Hibernate;
- Knowledge of JOGL/OpenGL;
- Experience with Subversion and Git;
- Experience with Hadoop/Hive;
- Experience with SOAP;
- Experience with MySQL;
- A doctorate in a relevant field and post-doctoral research experience;
- A substantial track record of high-quality publications in internationally leading venues in a relevant area;
- A track record advising the research of doctoral or undergraduate project students;
- A track record of writing successful applications for research funding;

Candidates with prior experience of security research, in particular on network defence in an enterprise environment, are especially encouraged to apply, but software-development ability is the principal criterion.

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 full-time appointment, is available for a fixed term initially of 10 months commencing June 2013; there is a possibility, but no guarantee, of a project extension for a further 12 months. The post has a salary on the University grade 08 scale (currently £37,382 to £44,607). 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), pro rata.

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 **job11@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. You will also be asked to provide reference details as part of the online application process and will be asked to indicate whether you are happy for us to contact your referees directly should they not provide a reference by the stated 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.