

OXFORD UNIVERSITY COMPUTING LABORATORY

Project: CONNECT-IP: Emergent Connectors for Eternal Software Intensive Networked Systems

Student Researcher Grade 6

Further particulars

The Computing Laboratory has a vacancy on an EU-funded FP7 research project CONNECT-IP which runs for three and a half years from 1st February 2009 (subject to contract). The project is centred on a revolutionary concept of a seamless networking infrastructure for digital systems that enables continuous composition of networked systems and the evolution of their functionalities. This will be achieved through the application of formal reasoning, learning, and run-time synthesis of architectural connectors. The overall aim is to develop the principles and foundations for the architectural design, modelling and reasoning about networked systems.

This exciting project will provide the successful candidate with the opportunity to interact with members of the partner sites in France, Germany, Sweden, Italy, China and the UK. The Oxford component is led by Professor Marta Kwiatkowska and the contribution will focus on the formal foundations for connectors and automated quantitative verification techniques for non-functional requirements such as dependability.

The Grade 6 Student Researcher will engage in research leading towards a doctorate (D.Phil.) under the supervision of Professor Marta Kwiatkowska. The topic of D.Phil. study will be selected to suit the background of the successful candidate and is expected to concern the development of quantitative verification techniques with application to dependability assurance. The researcher will also be expected to contribute to writing research papers, conference presentations and software demos. Collaboration with other researchers in Professor Kwiatkowska's group will be encouraged. Familiarity with aspects of concurrency theory and/or verification techniques will be expected. Strong coding skills in C/C++ will be necessary. Experience with assume-guarantee reasoning and/or dependability analysis using the PRISM model checker will be an advantage.

For more information about related research in the Laboratory see:

Verification research theme: <http://web.comlab.ox.ac.uk/research/verification/>

Quantitative Analysis and Verification group: <http://web.comlab.ox.ac.uk/activities/qav/>

PRISM model checker: <http://web.comlab.ox.ac.uk/activities/prism/index.html>

Main Duties and Responsibilities

Main duties for this role will be as agreed with the supervisor and will include:

- contribution to the development of theoretical foundations for connector algebras;
- development of novel verification algorithms and implementation techniques;
- implementation of prototype tools and software deliverables;

- evaluation of techniques via case studies;
- contributing to the writing of progress reports;
- travel and interaction with academic and industrial partners.

Selection criteria

Applicants should have (or expect shortly to obtain)

- an undergraduate or Masters degree in computer science or related subject and:
- must satisfy the usual requirements for studying for a doctorate at Oxford, see: <http://web.comlab.ox.ac.uk/oucl/prospective/dphil/dphil-criteria.pdf>
- prior experience of concurrency and/or verification;
- familiarity with one or more the of the following is required:
 - process calculi
 - connector algebras
 - model checking
 - formal reasoning, e.g. assume-guarantee
 - probabilistic verification, including statistical model checking
 - Quality of Service
- excellent coding skills in C/C++;
- familiarity with software verification tools;
- good scientific writing ability;
- good communication skills in English;
- ability and willingness to mentor or supervise doctoral students;
- ability to work as part of a team in a research community;
- project management skills.

Salary and Benefits

The starting salary will be £25,623 pa on the University grade 06S scale (currently £25,623 to £30,594 pa), includes membership of the University Superannuation Scheme, and has an annual leave entitlement of 38 days per year (inclusive of all public holidays and university closed periods). The post is available from 1st May 2009 and must be taken up by 1st August 2009. Fees (college and university) are at a reduced rate of approximately £3,500 per annum, with 50% to be refunded by the project conditional on satisfactory progress.

Application Procedure

Applications should be in the form of a letter of application (clearly stating the post title) setting out how the candidate meets the selection criteria, outlining the proposed contribution to be made, and supported by a full curriculum vitae, together with the names and addresses of two referees. These should preferably be emailed (most formats accepted) to job03@comlab.ox.ac.uk or alternatively, posted to: The Administrator, Oxford University Computing Laboratory, Wolfson Building, Parks Road, Oxford, OX1 3QD, to arrive by **Monday 5th January 2009**.

Candidates must ask their referees to consider these further particulars and email the reference directly to job03@comlab.ox.ac.uk or alternatively to the above address (fax (+44 1865 283532)) so that references arrive by the closing date.

Informal enquires about the post can be addressed to Marta Kwiatkowska (email: Marta.Kwiatkowska@comlab.ox.ac.uk).

The closing date for applications is **5th January 2009**.

The policy and practice of the University of Oxford require that all staff are offered 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 his or her age, sex, marital or civil partnership status, sexual orientation, religion or belief, racial group or disability.

Applicants who would need a work visa if appointed to the post are asked to note that under the UK's new points-based migration system they will need to demonstrate that they have sufficient points, and in particular that:

- (i) they have sufficient English language skills (evidenced by having passed a test in basic English, or coming from a majority English-speaking country, or having taken a degree taught in English)

and

- (ii) that they have sufficient funds to maintain themselves and any dependants until they receive their first salary payment.

Further information is available at:

<http://www.ukba.homeoffice.gov.uk/workingintheuk/tier2/generalarrangements/eligibility/>.

All data supplied by applicants will be used only for the purposes of determining their suitability for the post and will be held in accordance with the principles of the Data Protection Act 1998 and the University's Data Protection Policy, but if the person appointed to the post is a migrant sponsored under the UK's new points-based migration system, we are required to retain all applications for the duration of the sponsorship.