

Oxford University Computing Laboratory
SUAAVE Project: Sensing Unmanned Autonomous Aerial Vehicles
Grade 7 Research Assistant Post

Further particulars

Oxford University Computing Laboratory (OUCL) has been awarded an EPSRC grant to investigate the principles underlying the control of clouds of networked resource-limited unmanned aerial vehicles (UAVs) acting as sensor platforms in a variety of scenarios, like search-and-rescue, security and surveillance. This research is led by Dr Niki Trigoni and Dr Stephen Cameron at the Oxford University Computing Laboratory, in collaboration with Dr Stephen Hailes and Dr Simon Julier at University College London, and Professor Gerard Parr and Professor Sally McClean at the University of Ulster. The project will employ a postdoctoral Research Assistant and two doctoral students at OUCL, and has the aim of engineering a fully autonomous aerial platform consisting of multiple helicopter UAVs capable of searching for a given target.

The Research Assistant (RA) will work with the doctoral student on the following tasks:

- study the trade-offs between sensing coverage and network connectivity in the context of target detection and tracking by a group of UAVs;
- design distributed search algorithms for dynamic environments where the requirements for coverage and connectivity continuously change over time, as UAVs discover partial information about target location;
- extend distributed search algorithms to take into account context information (maps of the region, paths that the target is likely to follow) provided by experts via the ground stations;
- take into account the geography of the environment and the presence of other vehicles when tasking the UAVs (path planning);
- investigate the potential for using visual detection of aerial obstacles (sense and avoid), and other safety issues;
- implement and evaluate search algorithms in a simulation environment, as well as using a real UAV testbed;
- present information in a coherent and easily comprehensible way to search teams and to the situation commander;

It is anticipated that the RA will carry out a substantial part of the implementation on UAV platforms, and so will need to have strong practical and coding skills and the ability to organize experiments and clearly document results. Further, the RA will be expected to assist in writing papers, supervising the doctoral students, and with the large-scale outdoor experiments that are scheduled towards the end of the project.

Selection criteria

Preference will be given to candidates who have (or expect shortly to obtain)

- a doctoral degree in computer science, or related discipline;
- experience in developing distributed algorithms for mobile or sensor networks;
- experience in robotics or with UAVs;
- excellent skills in coding, setting up experiments and writing up results in a timely fashion;
- 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

Salary will be on the University grade 7 scale (currently £27,466 - £33,780 p.a). The post is available from is available from October 2008 (with latest start date in January 2009) for a period of three years, is pensionable and includes an annual leave entitlement of 38 days per year, inclusive of public holidays and university closed periods .

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, and supported by a full curriculum vitae, together with the names and addresses of two referees. These should be emailed (most formats accepted) to job12@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 25th August 2008**.

Candidates must ask their referees to consider the further particulars and email the reference directly to job12@comlab.ox.ac.uk or, alternatively, post it to the above address (fax (+44 1865 273832) so that references arrive by the closing date.

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

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.