Research Associate in Tracking in a Networked Environment

Job Ref: REQ17205

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Project Description

To work on an Engineering and Physical Sciences Research Council (EPSRC)-Defence Science and Technology Laboratory (Dstl) funded project as part of the Loughborough, Surrey, Strathclyde Cardiff and Newcastle (LSSCN) Universities consortium within the Ministry of Defence (MoD) University Defence Research Centre (UDRC) scheme in signal processing; in particular, to provide signal processing solutions for the networked environment.

Candidates must have a PhD in signal processing, or a related topic, or equivalent experience, as well as experience of developing MATLAB software and familiarity with related toolboxes. Working knowledge of at least one of the following areas: advanced signal processing, Bayesian inference, particle filtering and machine learning would be advantageous. It is expected that the successful candidate will make contributions to the work package about reducing uncertainty in signal processing by incorporating domain knowledge or world models, particularly in one of the following two areas: object tracking in a networked environment by deeply exploiting domain knowledge; autonomous source term determination and (or) coverage tracking of chemical, biological or radiation substance using mobile sensor platforms particularly unmanned aerial vehicles.

The post holder will work within the Department of Aeronautical and Automotive Engineering at Loughborough University under the supervision of Professor Wen-Hua Chen. (S)he will close work with other researchers in the LSSCN consortium and industrial partners under the guidance of technical officers of Defence Science and Technology Laboratory (Dstl)

Job Grade: 6

Job Purpose:
To conduct research on reducing uncertainty in signal processing by incorporating domain knowledge or world models, particularly in one of the following two areas: object tracking in a networked environment by deeply exploiting domain knowledge; autonomous source term determination and (or) coverage tracking of chemical, biological or radiation substance using mobile sensor platforms particularly unmanned aerial vehicles.

Job Duties

- To develop moving object tracking and prediction algorithms by deeply exploiting domain knowledge for various applications (e.g. aerial vehicles or ground vehicles), or .
- To develop autonomous source search and determination algorithms for chemical, biological and radiation substance using mobile sensor platforms, or (and)
- To develop autonomous planning and estimation methods for unmanned aerial vehicles to estimate and track the coverage of hazard substance by taking into environment conditions.
- To implement and verify the proposed relevant autonomous tracking and (or) estimation algorithms with collected datasets generated from both synthetic and real test environments.
- To be involved in collecting, storing and managing the datasets, and to support other team members who may need to use the datasets as required.
- To collaborate and work with other research staff, the investigators and industrial partners.
- To write reports, conference and journal papers on the research outcomes and make presentations on the work to present to academic and other partners.

- To undertake such other duties as may reasonably be requested and that are commensurate with the nature and grade of the post.

Points To Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

Organisational Responsibility

Academic Principle Investigator – Professor Wen-Hua Chen

Person Specification

Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

1 – Application
2 – Test/Assessment Centre/Presentation
3 – Interview

Essential Criteria

Area	Criteria	Stage
Experience	Experience in signal processing, computer vision, autonomous systems, or statistics robotics related research	1,3
	Experience in doing research related to any of the following topics: advanced signal processing, multiple object tracking, Bayesian inference, and particle filtering and machine learning	1,3
	Experience in carrying on theoretic study using mathematically sound approaches	1,3
	Experience of computer programming	1.3
	Experience working in an academic or industrial research environment	1
Skills and abilities	An appreciation and understanding of operational requirements in defence or disaster management	3
	Ability to communicate complex technical concepts and requirements	1,3
	Record of presentation at International conferences and publication in International journals	1
	Ability to work independently and as part of a cross-disciplinary team	1,3
	Strong analytical skills with sound mathematical training	1,3
	Ability to design and develop autonomous signal processing techniques	1,3
	Ability to take part in collaborative activities	1,3
	A demonstrated ability to write research papers of high quality and make technical presentations to industrial and academic research groups	1,3
Training	Willingness to undertake training when necessary	3
Qualifications	A 2.1 or higher first degree in engineering, computer science or mathematics	1
Other	Evidence a good working knowledge of equal opportunities and understanding of diversity in the workplace	3

Desirable Criteria

Area	Criteria	Stage
Experience	Experience in developing and verifying autonomous functions, tracking or sensor fusion	1,3
	Knowledge of unmanned vehicles	1,3
	A strong publication track record	1,3
Skills and abilities	Strong programme skills	1,3
	Ability in modelling and making use of domain knowledge in estimation or inference	1,3
	A strong team player, and strong leadership skills for working with others	1,3

	Strong scientific writing skills	1.3
	Strong mathematical and problem solving skills	1.3
Qualifications	PhD Qualification in a relevant subject area or equivalent research experience	1

Conditions of Service

The position is FULL TIME and on a FIXED TERM contract until 30 June 2018. Salary will be on Supporting and Specialist Academic Grade 6 £29,301 - £32,958 per annum at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff, details of which can be found here.

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which are available at http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure---page.html.

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html

In addition, the University is supportive, wherever possible, of flexible working arrangements.
We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see http://www.lboro.ac.uk/services/hr/athena-swan/

Informal Enquiries

Informal enquiries should be made to Prof Wen-Hua Chen by email at: W.Chen@lboro.ac.uk or by telephone on +44 (0)1509 227230.

Applications

The closing date for receipt of applications is 6 April 2017.