Further Particulars:

**Postdoctoral Research Associate in Cognitive Radar**

**Job Title:** Research Associate

**Department:** Electronic and Electrical Engineering

**Reports to** Principal Investigator of UCL Dstl-supported project “Beyond The Ambiguity Function”.

**Grade:** Grade 7, point 29 starting salary £33,353 (inc. London Allowance of £2,919)

**Start Date:** The position is available with immediate effect, for a period of 8 months.

**Overview**

This is a Research Associate position available on a recently awarded Dstl-funded project, to investigate novel cognitive radar techniques.

The period of appointment is for 8 months full-time, available immediately.

Appointment at Grade 7 is dependent upon having been awarded a PhD; if this is not the case, initial appointment will be at research assistant Grade 6B (salary £29,193 - £30,783 per annum) with payment at Grade 7 being backdated to the date of final submission of the PhD thesis (including corrections).

The postholder will be required to carry out research on cognitive radar systems. This work will include designing and running computer simulations and recording, analysing and writing up the results as part of a research team.
Background

This project addresses a specific challenge in networked sensing, under a Dstl programme in Signal Processing in the Networked Battlespace.

Project Outline

The battlespace of the future may be expected to be spectrally crowded – with signals from sensors, communications and jamming as well as civilian communications, broadcast and radionavigation transmissions. At the same time, radar sensors may require large bandwidths to give high range resolution, so the challenge is to extract the maximum information from a complex and dynamically-changing target scene, against targets of low radar signature.

Waveform Diversity takes advantage of the fact that modern digital technology now allows us to generate precise, wide-bandwidth radar waveforms, and to vary them adaptively, potentially even on a pulse-to-pulse basis. Cognitive Sensing exploits this by dynamically adapting the form of its transmitted signal according to its perception of the target scene, contributing to and being informed by memory.

Military radar systems of the future may therefore be distributed, cognitive – and perhaps biologically-inspired, multistatic, spectrally-efficient, and may use unmanned platforms.

In the first part of the study the various definitions of cognitive radar and cognitive sensing will be reviewed to produce (a) a coherent definition and understanding, and (b) the definition of scenarios that will be used in the rest of the study as the basis of evaluation of cognitive radar techniques, and the performance measures that will be used to assess their performance.

In the second part of the study, the scenarios developed in the first part will be used to evaluate the performance of a cognitive radar, showing how the radar waveform can be varied in response to the changing target scene and spectral occupancy, and quantifying the benefit obtained.

References

Duties and Responsibilities

The Research Associate will be responsible for carrying out the above research with assistance from members of UCL academic staff and other undergraduate and postgraduate student support. The following is indicative of the duties and responsibilities associated with this post:

- Attending and presenting results at regular project review meeting.
- Attending ad-hoc technical meetings between project personnel and other appropriate UCL or collaborating personnel on an as needed basis to resolve technical issues.
- Assisting with writing of appropriate papers for publication or conference presentation.
- Producing the project reports and deliverables as required by the sponsors.
- Contributing to the design of a range of simulations and experiments in relation to the project.
- Setting up and running computer simulations and experiments in consultation with the Principal Investigator and recording, analysing and writing up the results.
- Ensuring that experiments are appropriately supervised and supported that equipment is safe and maintained in working order.
- Preparing and presenting findings of research activity to colleagues for review purposes.
- Contributing to the drafting and submitting of papers to appropriate peer-reviewed journals, and prepare progress reports on research for funding bodies as required.
- Contributing to the preparation and drafting of further research bids and proposals.
- Contributing to the overall activities of the research team and department as required.

As duties and responsibilities change, the job description will be reviewed and amended in consultation with the postholder, and will carry out any other duties as are within the scope, spirit and purpose of the job as requested by the line manager or Head of Department/Division.

The post will be held in the UCL Radar Systems group working in collaboration with collaborating partners and other UCL departments as appropriate. These groups have well-equipped laboratories and computing facilities and a wide range of grants and contracts in the areas of radar systems and surveillance, networks and security systems. This work is supported by a large range of funding agencies and government bodies.
About UCL and the Department of Electronic and Electrical Engineering

University College London (UCL) was founded in 1826 as the third university in England, after Oxford and Cambridge. UCL was the first university in England to admit students of any race, class or religion, and the first to welcome women on equal terms with men. UCL is now the largest comprehensive university in London with more than 4,000 academic and research staff in 72 departments. The main campus of UCL is located in central London, just a few minutes walking distance from British Museum, West-End and Thames River.

The Department of Electronic and Electrical Engineering at UCL was established by Professor Sir Ambrose Fleming in 1885 and has a very strong research culture, state-of-the-art research equipments and facilities, and a very rich history of many fundamental research achievements in electronic and electrical engineering. The Department currently hosts international renowned research groups in Communications and Information Systems; Photonics; Optical Networks; Sensors, Systems and Circuits; Electronic Materials and Devices and Nanotechnology. For more information about the department and our research achievements, please visit the website http://www.ee.ucl.ac.uk

Further information regarding UCL may be found at:
www.ucl.ac.uk/

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Person Specification for the Post of Research Associate

Qualifications and Knowledge
- PhD (or about to obtain prior to appointment) in relevant engineering or science subject area (essential).
- First degree in an engineering or physical sciences subject (essential).
- Knowledge of computer simulation and experimental research techniques (essential).
- Knowledge of radar waveform theory and practice (essential).

Skills
- Software and hardware experimental research skills (essential).
- Ability to analyse and write up data in the form of journal papers and sponsors reports (essential).
- Ability to present technical information effectively to a range of audiences (essential).
- Effective written and verbal communication skills (essential).

Experience – Substantial experience in the following areas:
- Experience in radar research (essential).
- Software simulation tools and techniques (essential).
- Preparing papers and reports for publication (essential).

Personal Qualities
- Commitment to high quality research (essential).
- Ability to organise and plan work effectively to meet deadlines (essential).
- Ability to work collaboratively and as part of a team (essential).
- Commitment to UCL’s policies e.g. equal opportunity, health and safety (essential).
- The ability to work harmoniously with colleagues and students of all cultures and backgrounds (essential).
HOW TO APPLY

Interested applicants are encouraged to make informal enquiries to Professor Hugh Griffiths, h.griffiths@ucl.ac.uk, 020 7679 3966.

All applications should be submitted via UCL online recruitment system at the following link:

http://www.ucl.ac.uk/hr/jobs and search for reference 1487083.

If you have any queries regarding the application process please contact Vicky Coombes (v.coombes@ucl.ac.uk) quoting reference 1487083.

Further particulars and details of how to apply are also available at www.ee.ucl.ac.uk/vacancies

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