Job Description

Research Fellow – Radar & RF Sensing Signal Processing

Ref: 1801980

Department: Electronic & Electrical Engineering

Salary: Grade 7 salary range £35,328 - £42,701 (inc. London Allowance).

Reports to
Dr. Matthew Ritchie

Context
We wish to recruit a Research Fellow from 1st June 2019 or as soon as possible thereafter, as part of a 21 month research position. This position would work on the recently awarded University Defence Research Collaboration (UDRC) project, Signal Sensing, Design and Delivery for Electronic Warfare. This project is a funded themed call as part of the third phase of the UDRC and is a collaboration with Imperial College London. This role focuses on the Application Theme in the area of Electromagnetic Environment signal processing, more details at: https://www.gov.uk/government/publications/university-defence-research-collaboration-in-signal-processing. The main UDRC Consortium (led by Edinburgh University) will also be close collaboration partners.

As well as 2) Waveform Ambiguity Function analysis, where multiple nodes of radar systems can be modelled to evaluate the dynamic relationship between geometry and performance. In-depth knowledge of signal processing and RF sensing would be essential as part of this role.

Funding:

The post is available from 1st June 2019 or as soon as possible thereafter for a period of 21 months, in the first instance. Further funding to support the post may be available.

This £1M grant, funded by EPSRC and Dstl, aims to investigate innovative new signal processing concepts that focus on two key aspects, 1) Sensing Signals and Extracting Information and 2) Signal Design and Delivery. Specifically this PDRA role will look to contribute to novel research in 1) Signal Subspace Validation - where a Simulink model of transmitted/received RF signal will be created and processing techniques developed to enhance detection and classification of signals of interest.
Main purpose of the job

Duties and responsibilities

This Research Fellow role will be responsible for developing models and signal processing concepts in the area of Radar Frequency (RF) sensing. The following is indicative of the duties and responsibilities associated with this post:

- Lead on the development of simulation models for describing RF transmission, propagation and reception.
- Develop new techniques in the area of signal subspace processing building on ideas such as Hough or Wigner-Hough transforms for signal detection.
- Create flexible model for the analysis of radar ambiguity functions as part of network of radar sensors.
- Regularly communicate and work in close collaboration with the post supervisor and national and international collaborators.
- Interact with other researchers who are working on the UDRC project and proactively engage with Dstl and industrial partners.
- Publish research in leading journals and present it at national and international conferences.
- Contribute to the preparation of reports and the presentation of results at progress meetings.
- Contribute to the overall activities of the research team and department as required.
- Ensure that equipment is safe and maintained in working order and to maintain an awareness of UCL Fire and Health and Safety regulations.
- Actively follow UCL policies including Equal Opportunities policies.

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 is to be held in the UCL Department of Electronic and Electrical Engineering. Access to UCL’s Legion HPC cluster could be provided if required.
## Person Specification

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<th>Qualifications &amp; Skills</th>
<th>Essential or Desirable</th>
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<tr>
<td>PhD in relevant area of physical sciences or engineering. (or about to submit)</td>
<td>Essential</td>
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<td>A first degree in theoretical physics, applied mathematics, materials sciences or electrical engineering</td>
<td>Essential</td>
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<td>In-depth knowledge of Radio Frequency (RF) sensing and signal processing</td>
<td>Essential</td>
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<td>Expertise in scientific programming in languages such as Python, Matlab or similar.</td>
<td>Essential</td>
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<td>Strong mathematical and Digital Signal Processing (DSP) skills.</td>
<td>Essential</td>
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<td>In-depth knowledge of electromagnetic theory</td>
<td>Desirable</td>
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<td>Ability to analyse and write up data in the form of journal papers and reports.</td>
<td>Essential</td>
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<td>Ability to organise and plan work effectively to meet deadlines.</td>
<td>Essential</td>
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<td>Capability to develop an independent research profile within the period of the grant.</td>
<td>Desirable</td>
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### Personal

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<td>Excellent interpersonal and communication skills .</td>
<td>Essential</td>
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<td>Ability to present technical information effectively to a range of audiences.</td>
<td>Essential</td>
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<td>Commitment to high quality research.</td>
<td>Essential</td>
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<td>Ability to work collaboratively and as part of a team.</td>
<td>Essential</td>
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<td>Experience of working within a research project involving academic and industrial partners</td>
<td>Desirable</td>
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<td>Commitment to UCL’s policies eg equal opportunity, health and safety.</td>
<td>Essential</td>
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If the successful candidate has not yet been awarded their PhD, appointment will be made as a Research Assistant (Grade 6B)*. Payment at Grade 7 will be backdated to the date of final submission of the PhD thesis including corrections, once the PhD has been awarded.

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 is 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 organized into 11 constituent faculties, within which there are over 100 departments, institutes and research centres. UCL has 983 professors and more than 7000 academic staffs who are dedicated to research and teaching of the highest standards. Its student community is almost 36,000, the largest in the UK. There are 29 Nobel Prize winners and three Fields medalists amongst UCL’s alumni and current and former staff. UCL is the top rated university in the UK for research excellence (REF2014). It has a strong tradition and large knowledge base in medical research with a dedicated institute on Healthcare Engineering and 10+ hospitals. UCL has world-class support for researchers and has been voted the best place for postdoctoral researchers to work for consecutive years by The Scientist magazine. The main campus of UCL is located in central London, close to 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 equipment and facilities, and a very rich history of many fundamental research achievements in electronic and electrical engineering. The department has received top ratings in every UK research evaluation carried out to date.

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

Information about the departments may be found at:  
https://www.ucl.ac.uk/electronic-electrical-engineering/

How to Apply

Interested applicants are encouraged to make Informal enquiries about the post to Dr. Matthew Ritchie.  
+44 (0)20 7679 3959 m.ritchie@ucl.ac.uk

All applications should be submitted via UCL online recruitment system at the following link:  
http://www.ucl.ac.uk/hr/jobs/

Job Reference: 1801980

If you have any queries regarding the application process please contact Vicky Coombes at v.coombes@ucl.ac.uk quoting reference 1801980

UCL Taking Action for Equality