Wolfson School of Mechanical, Electrical and Manufacturing Engineering

Loughborough University

POSTDOCTORAL RESEARCH ASSOCIATE IN SIGNAL PROCESSING

REQ16822

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

School/Department summary

The Signal Processing and Networks Research Group within the Wolfson School of Mechanical, Electrical and Manufacturing Engineering at Loughborough University is looking for an exceptional individual to strengthen research in the field of Signal Processing Solutions for Full-duplex Heterogeneous Networks. Candidates with research experience in one or many of the following fields are encouraged to apply: Signal Processing, Convex Optimization, Stochastic Geometry and Machine Learning.

Loughborough is a progressive and distinctive University with a proud tradition of being research-intensive. It has been shown through successive National Student Surveys, excellent league tables and seven Queen's Anniversary Prizes, to be one of the UK's leading Higher Education Institutions.

The Wolfson School of Mechanical, Electrical and Manufacturing Engineering is one of the largest of its kind in the UK and has an international reputation for being at the forefront of technological innovation and for maintaining extensive links with industry. Research grants (predominantly from the UK Research Councils and the EU), as well as extensive industrial sponsorship, support a range of research posts and enable the purchase of state of the art equipment.

The Signal Processing and Networks Research Group is one of the largest research groups within the Wolfson School of Mechanical, Manufacturing and Electrical Engineering. The group currently includes five academic staff, three postdoctoral research associates and many research students. The group has an established reputation in the areas of signal processing and communication networks and is a member of one of the two DSTL/EPSRC funded consortia in the UK on University Defence Research Collaboration in Signal Processing.

Project Description:

The focus of this project, which is funded by the Engineering and Physical Science Research Council (EPSRC) of the UK is on the development, analysis and demonstration of signal processing and networking algorithms for exploring the potential of full-duplex radios in multiple-input multiple-output (MIMO) heterogeneous wireless networks (HetNets). In particular the research associate will be expected to perform research and develop algorithms which will include precoding techniques, resource allocations, convex optimization, and machine learning for full-duplex applications in HetNets. The research associate will also be expected to work with other team members to build testbed using software radio peripherals such as NI USRP, PXI systems or WARP. The successful candidate will be expected to work closely with researchers at University College London (UCL).

Job Description

Job Grade:
Research Grade 6

Job Purpose
To conduct research in the area of signal porcessing for full-duplex MIMO heterogeneous networks within the signal processing and networks research group.

Job Duties
Specific, technical

- To perform literature survey about full-duplex MIMO networks
- To propose and develop MIMO signal processing algorithms for handling interference in full-duplex HetNets using optimisation methods and characterise the performance using stochastic geometry.
- To develop Matlab codes for conducting simulations.
- To help implement selected algorithms using software radio peripherals.
- To write reports and present the results to EPSRC, academic and industrial collaborators.
- To engage with researchers at UCL and present the results.
- To carry out other specific duties as may be reasonably requested by the project leader and that are commensurate with the nature and grade of the post.

General, technical:

- To formulate detailed plans for the project based on broad guidance from the project team.
- To feed back to the project team on progress, to make recommendations for next steps and to prepare interim and final project reports.
- To collaborate with co-workers in other Higher Education Institutions, and other relevant bodies.
- To support the project team by enhancing relationships with existing collaborators and by assisting the establishment of relationships with new collaborators.
- To write research papers suitable for publication in high quality academic journals and for presentation at specialist scientific conferences.
- To attend and contribute to scientific conferences.

Teaching:

- To assist the academic staff in the project team with the supervision of undergraduate and postgraduate students.

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

Reports to the Dr Gan Zheng, Senior Lecturer.

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	Significant postgraduate research experience in signal processing for communications	1, 3
	Significant experience of publishing research results in international journals or conferences related to wireless communications	1, 3
Skills and abilities	Knowledge of heterogeneous networks, mathematical optimisation, stochastic geometry and Matlab programming	1, 3
	Excellent written and oral communication, and IT skills	1, 3
	Self-motivated with ability to meet deadlines	3
	Ability to work independently and as part of a team, interacting with different academic and industrial partners	3
	Excellent interpersonal, and organisational skills	3
Training	Willingness to undertake appropriate further training and to adopt new procedures as and when required	3
Qualifications	A PhD degree (or about to complete) in Electronic Engineering or relevant field	1
Other	Evidence of a good working knowledge of equal opportunities and understanding of diversity in the workplace	3
	Commitment to maintain confidentiality at all times	3

Desirable Criteria

Area	Criteria	Stage
Experience	Current or recent relevant work experience at post-doctoral level in an academic or industrial environment	1, 3
	Experience of developing and analysing signal processing algorithms for wireless communications	1, 3
	Practical experience of working on multiuser MIMO wireless communications networks	1, 3
	Experience of working on research projects in a team	1, 3
Skills and abilities	Ability to assist in teaching of undergraduate or postgraduate students	3
	Knowledge of convex optimisation	1, 3

	Knowledge of machine learning techniques	1, 3
	Knowledge of software radio peripherals such as USRP	1, 3
Qualifications	A PhD degree (or about to complete) in Signal Processing for Wireless Communications	1
Other	Willingness to travel	3

Conditions of Service

The position is full-time and fixed term for one year. Salary will be on research grade 6 (£29,301 - £38,183) 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/Operational and Administrative 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 Dr Gan Zheng, Senior Lecturer by email at G.Zheng@lboro.ac.uk or by telephone on 01509 227035.

Applications

The closing date for receipt of applications is **15th December 2016**