Wolfson School of Mechanical, Electrical and Manufacturing Engineering

Loughborough University

Postdoctoral Research Associate in IoT and Wireless Networks: REQ210011

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.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 summary
The Signal Processing and Networks Research Group within the Wolfson School of Mechanical, Electrical and Manufacturing Engineering at Loughborough University (LU) is seeking an exceptional individual to strengthen research in the field of communications and signal processing.

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, Electrical and Manufacturing Engineering. The group has an established reputation in the areas of signal processing and communication networks.

Job Description

Job Grade: Specialist and Supporting Academic Grade 6

Job Purpose
To conduct research in the area of wireless communications within the Signal Processing and Networks research group. The focus will be on the development of signal processing algorithms and/or machine learning methods for IoT or 5G networks. In particular, the Postdoctoral Research Associate (PDRA) will be expected to perform research and develop algorithms which may span various topics such as convex optimizations, deep learning, game theory, IoT security, large intelligent surfaces and blockchain technology. The PDRA will collaborate with the project partners at Queen Mary University and Leicester University, among other potential industrial partners.

Job Duties
The work entails, primarily, the following activities under the direction and supervision of Professor Sangarapillai Lambotharan or a nominee:

Specific, technical
•   To perform literature survey and conduct research in IoT and 5G wireless communications.
•   To propose and develop algorithms and protocols for enhancing spectral efficiency or security of IoT and/or 5G networks.

- To implement algorithms in an appropriate programming language, for example Matlab and Python.
- To evaluate algorithms either by using public data sets and/or simulations.
- To develop a publication profile targeting high profile journals.
- To work with other academic and industrial partners of this project.
- To collaborate with and support other group members (PhDs, RAs), encouraging higher impact research and strengthening the research output of the group.
- 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 within the Signal Processing and Networks research group and, possibly, with other Higher Education Institutions and 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.

Other Related Activities and Functions

- To engage in training programmes in the University (eg through Professional Development) and elsewhere as required.
- To undertake such other duties as may be reasonably 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

Reports to the project investigators named above.

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	Research experience in signal processing or wireless communications or cyber security	1,3
	Experience in programming with either Matlab or Python	1,3
	Experience of publishing research results in high impact international journals	1,3
	Experience of having produced technical reports and / or guidance materials on engineering or science topics	1,3
Skills and abilities	Excellent written and oral communication, and IT skills	1,3
	Excellent analytical 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	First or upper-second class BSc or BEng degree and a PhD (or near completion) in Electronic Engineering or relevant Engineering field.	1
Other	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 convex optimization techniques and/or game theoretic algorithms and/or machine learning methods and/or cyber security algorthms	1,3
	Practical experience of working on wireless communication standards	1,3
Skills and abilities	Ability to assist in teaching of undergraduate or postgraduate students	1
	Knowledge of convex optimizations, machine learning, cryptography and game theory.	1,3
	Knowledge of baseband signal processing	1,3
Qualifications	PhD degree in signal processing or wireless communications or network security	1

Conditions of Service

This position is **full-time** and **fixed-term** until 28 February 2022. Salary will be on Specialist and Supporting Academic Grade 6 (£30,942 – £40,322 per annum), at a starting salary commensurate with experience and qualifications and to be confirmed on offer of appointment.

The appointment will be subject to the University's Terms and Conditions of Employment for Grade 6 and above 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.

The University offers a wide range of employee benefits which can be found here.

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/

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