

Candidate Information

Position:	Research Fellow - Advanced Massive MIMO Array Architectures
School/Department:	Centre for Wireless Innovation
Reference:	21/108636
Closing Date:	Monday 8 March 2021
Salary:	£33,797 per annum
Anticipated Interview Date:	Friday 19 March 2021
Duration:	3 Years

JOB PURPOSE:

To contribute to the ERC Consolidator Grant BEATRICE: Beyond Massive MIMO: Living at the Interface of Electromagnetics and Information Theory, led by Professor Michalis Matthaiou. The candidate will amalgamate communication theory with electromagnetic theory to develop new array solutions for advanced massive MIMO architectures. These new architectures should offer super-directivity and extremely sharp beamforming. The candidate will also become an active member of the Centre for Wireless Innovation and the School of EECS at QUB, assisting in the production of world leading research output and the teaching activities.

MAJOR DUTIES:

1. Develop a holistic communication theoretic framework using knowledge of the electromagnetic characteristics for super-directive.
2. Topological design of super-directive antenna arrays through new matching and decoupling networks.
3. Hardware-informed characterisation of super-directive antenna arrays, e.g. mutual coupling, intra-array coupling.
4. Evaluate the performance of the proposed solutions in MATLAB.
5. Develop and plan an area of personal research and expertise, and/or undertake research under supervision within a specific research project or as a member of a research team.
6. Carry out analyses, critical evaluations, and interpretations using methodologies and other techniques appropriate to experimental computing systems research.
7. Present regular progress reports on research to members of the research group or to external audiences to disseminate and publicise research findings.
8. Prepare, often in consultation with the supervisor, material for publication in national and international journals and presentations at international conferences.
9. Assist grant holder in the preparation of funding proposals and applications to external bodies.
10. Carry out routine administrative tasks associated with the research project/s to ensure that project/s are completed on time and within budget.
11. Carry out occasional undergraduate (final year, MEng) project supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
12. Read academic papers, journals and textbooks to keep abreast of developments in own specialism and related disciplines.

Planning and Organising:

1. Plan for the use of research resources, laboratories and workshops where appropriate.
2. Plan own day-to-day activity within framework of the agreed research programme.
3. Plan in advance to meet deadlines for journal publications and to prepare presentations and papers for conferences.
4. Coordinate and liaise with other project partners over work progress.

Resource Management Responsibilities:

1. Ensure research resources are used in an effective and efficient manner.
2. Provide guidance as required to support staff and any students who may be assisting with research.

Internal and External Relationships:

1. Liaise on a regular basis with colleagues and students in the Centre for Wireless Innovation, the School of EECS and faculties in Queen's University Belfast to build research collaborations.
2. Build internal contacts and participate in internal networks for the exchange of information and to form relationships for future collaboration.
3. Join external networks to share information and ideas.

ESSENTIAL CRITERIA:

1. PhD in Electronics, Electrical Engineering, or closely related discipline.
2. At least 2:1 honours degree in Electronics, Electrical Engineering, or closely related discipline.
3. At least 3 years relevant research experience in communication theory and electromagnetic theory for future wireless networks.
4. Relevant experience with massive MIMO array design.
5. Ability to contribute to research management and administrative processes.
6. Contribute to the School's outreach programme by links with industry, community groups etc.
7. Sufficient breadth and depth of specialist knowledge in the discipline and of research methods and techniques to work within established research programmes.
8. Ability to communicate complex information clearly.
9. Ability to build contacts and participate in internal and external networks.
10. Demonstrable intellectual ability.
11. Ability to assess and organise resources.
12. Ability to meet the mobility requirements of the post.

DESIRABLE CRITERIA:

1. Strong research background in communication theory and electromagnetism.
2. Previous relevant teaching experience.
3. Experience in EU or RCUK projects, in particular in project task management and reporting through periodic deliverables.
4. Experience working with external industrial or academic partners.
5. Experience in producing timely technical documentation on research projects (deliverables, reports).
6. Experience with presentations of research outputs in conferences, workshops, or seminars.