

Candidate Information

Position:	Research Fellow Holographic Metasurface for Imaging
School/Department:	Centre for Wireless Innovation
Reference:	19/107849
Closing Date:	Tuesday 29 October 2019
Salary:	£33,797 to £40,322 per annum
Anticipated Interview Date:	Tuesday 19 November 2019
Duration:	2 years

JOB PURPOSE:

As an active member of the research project/team, you will develop metasurface antennas for millimetre-wave computational imaging. This will include the development of polarimetric active metasurface antennas for single frequency computational millimetre-wave radar imaging. Additionally you will assist in the development of research proposals and the planning and delivery of the research activity within the area so that the overall research objectives are met.

MAJOR DUTIES:

1. Develop, design, simulate, fabricate and measure mmW reconfigurable holographic metasurface antennas for computational electromagnetic imaging applications.
2. Design dual-polarized reconfigurable metamaterial elements and develop polarimetric metasurface antennas.
3. Investigate techniques to achieve single-frequency waveform modulation of the metasurface antenna using active circuit components, such as diodes and varactors.
4. Develop RF/DC decoupled biasing circuits to bias the metamaterial elements.
5. Develop computational image reconstruction algorithms and polarimetric signal processing techniques.
6. Investigate new methods to improve the mode diversity of the developed antennas for computational imaging at mmW frequencies.
7. As part of a research team, verify the operation of the overall imaging system by simulations and measurements.
8. Present regular progress reports to members of the research team.
9. Prepare, in consultation with line manager, material for publication in prestigious leading journals and presentations at major international conferences to disseminate and publicise research findings.
10. Identify new funding opportunities and assist in the preparation of funding proposals.
11. Carry out, if required, occasional undergraduate and postgraduate supervisions, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
12. Carry out administrative tasks associated with the research project to ensure that project is completed on time and within budget, including organisation of project meetings and documentation, risk assessment of research activities, etc.
13. Keep abreast of new developments in own specialism and related research areas/disciplines.

Planning and Organising:

1. Plan details of research programmes and carefully align them with the work packages carried out by the research team in order to achieve an effective and productive synergy.
2. Plan for the use of research resources, laboratories and workshops where appropriate, in order to ensure that facilities are available at required times.
3. Plan own day-to day activity within framework of the agreed research programme.
4. Plan in advance to meet deadlines for internal/external progress reports, conference and journal publications.
5. Coordinate and liaise with other members of the research team 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 students who may be assisting with research.

Internal and External Relationships:

1. Liaise on a regular basis with colleagues, students and the industry partners.
2. Establish professional and good working relationships with technical and other support staff as well as the industry partners.
3. Build internal contacts and participate in internal networks for the exchange of information and to form relationships for future collaboration.
4. Join external networks at national and international levels to share information and ideas.

ESSENTIAL CRITERIA:

1. Hold or be about to obtain (within three months) a PhD in microwave and mmW engineering focusing on antennas and/or electromagnetic imaging.
2. At least a 2.1 undergraduate's degree in electrical/electronic engineering.
3. At least 3 years of mmW antenna design experience. Experience in metasurface antennas is highly desirable.
4. Experience in designing active/tunable RF components/antennas/arrays.
5. Experience with using electromagnetic simulation software, such as CST Microwave Studio.
6. Experience in programming with MATLAB.
7. Experience in conducting measurements and characterisation of microwave and mmW devices and antennas using measurement equipment such as vector network analysers, RF anechoic chambers, near-field scanners, etc.
8. Experience in PCB prototyping and/or fabrication.
9. A publication record in line with stage of career in prestigious leading journals (e.g. IEEE TAP, IEEE TMTT) and presentations at major international conferences.
10. Sufficient breadth and depth of knowledge in antenna theory and techniques.
11. Strong analytical and problem solving skills.
12. Ability to communicate complex information clearly.
13. Ability to build contacts and participate in internal and external networks.
14. Demonstrable intellectual ability.
15. Ability to assess and organise resources
16. Ability to meet the mobility requirements of the post e.g. conference attendance.

DESIRABLE CRITERIA:

1. A PhD in electromagnetic imaging with emphasis on antenna design and radar signal processing.
2. Hold a master's degree in a relevant subject.
3. Performed work relevant to computational imaging and compressed sensing.
4. Experience in solving electromagnetic imaging and inverse problems using MATLAB.
5. Experience of sparse/thinned antenna arrays
6. Experience of metamaterials and metasurfaces.
7. Experience of non-reciprocal electromagnetic structures.
8. Experience of multiple-input-multiple-output (MIMO) antennas.
9. Experience in managing a research project.
10. Experience in writing a funding proposal.