Candidate Information

Position:	Research Fellow - RF Hardware/Antenna Design
School/Department:	Centre for Wireless Innovation
Reference:	20/108157
Closing Date:	Monday 23 March 2020
Salary:	£33,797 to £40,322 per annum.
Anticipated Interview Date:	Monday 6 April 2020
Duration:	36 months

JOB PURPOSE:

Design and implementation of RF radar hardware and antennas for near-field millimetre-wave imaging applications. This will be carried out as part of a research team, within an exciting new Leverhulme Trust funded project, aiming to develop real-time compressive radars for security-screening applications. This is a unique opportunity to build the next generation millimetre-wave radar systems and work at one of the leading institutions in the United Kingdom in millimetre-wave technology, Centre for Wireless Innovation (CWI), Queen's University Belfast, collaborating with an international team of academics and industry.

MAJOR DUTIES:

1. Design and develop radar hardware and systems for millimetre-wave imaging.
2. Develop, simulate and measure millimetre-wave antennas, and investigate sparse radar aperture layouts for computational imaging radars.
3. Develop hardware solutions to achieve real-time radar measurements and data acquisition.
4. Liaise with others in the research team to carry out system integration and RF hardware design for near-field radar systems.
5. As part of a research team, verify the operation of the overall radar system by simulations and measurements.
6. Present regular progress reports to members of the research team.
7. 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.
8. Identify new funding opportunities and assist in the preparation of funding proposals.
9. Carry out, if required, occasional undergraduate and postgraduate supervisions, within the post holder's area of expertise and under the direct guidance of a member of academic staff.
10. 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.
11. 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 and students.
2. Establish professional and good working relationships with technical and other support staff.
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. At least a 2.1 undergraduate's degree in electrical/electronic engineering or physics.
2. Hold or be about to obtain (within four months) a PhD in a relevant subject.
3. At least 3 years relevant research experience to include:
   • At least 2 years design and implementation experience of radar system development and/or antenna design for imaging radars.
   • Solid knowledge in radar system engineering, such as experience of RF radar backend design, IF processing and sampling etc.
   • Experience in RF passive antenna element/array design.
   • Experience with using software such as ADS and/or Microwave Office and/or CST Microwave Studio and/or Ansoft HFSS.
   • Experience in conducting measurements and characterisation of RF/Microwave devices and circuits and antennas using measurement equipment such as vector network analysers, spectrum analysers, power meters etc.
4. A publication record in line with stage of career in prestigious leading journals (e.g. IEEE Transactions, IET, etc) and presentations at major international conferences.
5. Sufficient breadth and depth of knowledge in microwave circuits theory and techniques.
6. Strong analytical and problem solving skills.
7. Ability to contribute to broader management and administrative processes.
8. Ability to communicate complex information clearly.
9. Ability to build contacts and participate in internal and external networks.
10. Ability to assess and organise resources.
11. Ability to meet the mobility requirements of the post, i.e. an ability and willingness to travel to attend meetings with industry partner and conferences where applicable.

DESIRABLE CRITERIA:

1. A master's degree in a relevant subject.
2. A PhD in a radar antenna design related subject.
3. Experience of sparse/thinned antenna arrays.
4. Knowledge in compressive sensing.
5. Knowledge in metasurface antennas.
6. Performed work relevant to near field antenna measurements, near-field processing and near-field / far-field transformations.
7. Experience with using PCB prototyping software, such as LPKF CircuitCAM, LKPF board master, Altium Designer, AutoCAD etc.
8. Ability to code and implement data acquisition algorithms on target hardware.
9. Experience with using MATLAB.
10. Experience of radar waveform design.
11. Experience in managing a research project.
12. Experience in writing a funding proposal.