Candidate Information

Position:	Intelligent Infrastructure Research Fellow
School/Department:	Mechanical & Manufacturing Engineering
Reference:	19/107454
Closing Date:	Wednesday 5 June 2019
Salary:	£33,199 - £39,610 per annum (potential to progress to £43,266 per annum through sustained exceptional contribution)
Duration:	60 months

JOB PURPOSE:

We are seeking a highly-motivated post-doctoral researcher for a five year period in the field of fleet sourced monitoring to join the Intelligent Infrastructure Group and the Sir William Wright Technology Centre (W-Tech) at Queen's University Belfast. As part of the Centre the researcher will support activities in a newly funded EPSRC Prosperity Partnership, StreetZero, aimed at exploring the implications of a move towards increasing electrification of bus vehicles. The researcher will work in a multidisciplinary team with researchers from vehicle engineering, civil engineering and policy to undertake fundamental research in fleet sourced monitoring. By stimulating a digital transformation in the monitoring, processing and analysis of information about our infrastructure we can predict how it will perform under changing vehicle loads, cycles of loading and environmental factors and move towards Smart Infrastructure. This post offers an exciting opportunity for someone with a passion for working at the cutting edge of novel integrated solutions for smart infrastructure.

MAJOR DUTIES:

1. Development of condition monitoring, primarily on bridge structures due to the critical role they play in many UK cities in sustaining accessible bus networks.
2. To develop systems for drive-by monitoring by (a) assessing energy requirements of each activity (sensing, transmission of data), (b) the output and reliability of the transfer and (c) reliability of wireless sensor data using drive-by monitoring.
3. To assess change in infrastructure condition by using drive-by sensors. Damage leads to changes in dynamic properties. The first natural frequency can be insensitive to damage but provisional work has indicated that 1st natural mode shapes may show strong potential. This will require participation in testing activities in conjunction with the industrial partners at testing sites, as required.
4. Write high quality outputs for publication in top international journals in the field.
5. To support the supervision of PGR students and other research staff within the W-Tech Centre and in Civil Engineering.
6. Carry out undergraduate supervision / demonstrating / teaching duties under direction. Carry out routine administrative duties as requested e.g. arranging research group meetings.
7. Critically evaluate academic papers, journals and textbooks to provide state of the art in the research area.
8. Attend relevant conferences, seminars or training days as required for the post.
9. Carry out any other duties designated by a line manager and which fall within the general remit of the post.

Planning and Organising:

1. Plan own day-to-day activity within the framework of the agreed research programme.
2. Contribute to the planning of research projects, reports and publications etc.

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 with research colleagues and support staff on routine matters.

2. Develop internal and external contacts to develop knowledge and understanding and form relationships for future collaborations with industrial partners and OEMs.
3. Attend and contribute to relevant meetings, conferences, seminars, etc.

ESSENTIAL CRITERIA:

1. Have or are about to obtain, a PhD in Civil/Structural, Mechanical, Aerospace, Electronic, Physics, Applied Mathematics or a related discipline. For those applicants about to obtain a PhD, they must have submitted their intention to submit prior to the application deadline.
2. Have obtained a first or upper second degree (or equivalent) in Civil/Structural, Mechanical, Aerospace, Electronic, Physics, Applied Mathematics or a related discipline.
3. A minimum of three years' relevant research experience in structural health monitoring (SHM) of civil infrastructure, use of sensors for SHM and post processing techniques to establish frequency/mode shapes.
4. Demonstrate an ability to manage your own research and to plan research activities effectively.
5. Excellent verbal and written communication skills.
6. Demonstrate experience of communicating with developing and maintaining academic and/or industrial relationships.
7. Must be willing to work flexibility and travel to partner sites and testing sites as necessary.

DESIRABLE CRITERIA:

1. Experience of drive by monitoring.
2. Experience of FEA analysis.
3. Experience in data analytics.
4. Experience in programming in MATLAB® or similar high level language.
5. Ability to meet mobility requirements of the post.