

## Candidate Information

<b>Position:</b>	Research Fellow, School of Natural and Built Environment
<b>School/Department:</b>	Civil Engineering
<b>Reference:</b>	22/110008
<b>Closing Date:</b>	Monday 1 August 2022
<b>Salary:</b>	£34,304 - £36,382 per annum
<b>Anticipated Interview Date:</b>	Thursday 18 August 2022
<b>Duration:</b>	Fixed Term 24 months

### JOB PURPOSE:

To undertake research into creating and shaping the information and knowledge delivery systems that will enable the condition-based health management of critical infrastructure. The specific aim will be to create and develop sensor technology with onboard artificial intelligence, enabled by edge computing and incorporate data captured from this technology into the overall project framework. A major aspect will also be to investigate and create models from the information available in an existing inventory of infrastructure monitoring information. The researcher will collaborate closely with the project partners in order to create and develop prototypes that can be demonstrated on real structures.

### MAJOR DUTIES:

1. Create low-power high performance, autonomous synchronised recorders and then develop mechanisms for performing input-output structural system identification under certain conditions.
2. Create new AI-based sensor using emerging embedded AI platforms for performing structural monitoring including the development of clever communication strategies between the sensors and the ROSEHIPS Framework, and techniques for prolonged operation in remote environments.
3. In collaboration with other team members, study and collate the features of the structural performance measurements from an existing inventory of monitoring information for infrastructure including bridges, lighthouses chimneys and other buildings, with the aim of populating the ROSEHIPS Framework.
4. Carry out analyses, critical evaluations, and interpretations using methodologies and other techniques appropriate to area of research.
5. Present regular progress reports on research to members of the research group or to external audiences to disseminate and publicise research findings.
6. Prepare, in consultation with the grant holders, material for publication in national and international journals and presentations at international conferences.
7. Assist grant holder in the preparation of funding proposals and applications to external bodies.
8. Carry out routine administrative tasks associated with the research project/s to ensure that project/s are completed on time and within budget. These might include organisation of project meetings and documentation, financial control, risk assessment of research activities.
9. Carry out occasional undergraduate and/or postgraduate supervision, demonstrating or teaching duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
10. Read academic papers, journals and textbooks to keep abreast of developments in own specialism and related disciplines.

### ESSENTIAL CRITERIA:

1. Degree in computer science, electrical/electronic engineering or high qualification in a relevant subject.
2. Normally have or be about to obtain a relevant PhD, e.g. in the areas of computing hardware, programming, data analytics.

3. At least 3 years recent relevant research experience to include:
  - o research into approaches and practical implementation of embedded sensors for performing structural monitoring ideally, but in some practical application.
  - o Proven track record of undertaking analyses, critical evaluation and interpretations of infrastructure data as relevant to the research project.
  - o Working effectively as part of a research team in the development and promotion of the research theme.
  - o Strong publication record commensurate with stage of career.
4. Ability to contribute to broader management and administrative processes.
5. Contribute to the School's outreach programme by links with industry, community groups, etc.
6. Sufficient breadth and depth of specialist knowledge in the discipline and of research methods and techniques to work within established research programmes.
7. Practical problem solving skills, independence of thought and initiative.
8. Ability to assess and organise resources.
9. Ability to communicate complex information in English effectively in oral and written format.
10. Ability to build relationships to develop internal and external networks.
11. Demonstrable intellectual ability.
12. Commitment to continuous professional development.

**DESIRABLE CRITERIA:**

1. Research experience in one or more of the following topics:
  - Development of low-power high performance sensor systems.
  - Ability to perform input-output structural system identification.
2. Participation in UKRI projects.