| Job Title: | Research Officer/Research Assistant (1B) |
|---|---|

| Responsible to: | Head of research group, or principal investigator |
|---|---|

| Responsible for: | There is no direct supervisory responsibility |
|---|---|

### Job Summary and Purpose:

To support research activity in accordance with specified research project(s) under the supervision of the principal investigator

### Main Responsibilities/Activities

To support a research team by contributing to the planning of research projects and undertaking prescribed research tasks in accordance with specified research project(s), making use of standard research techniques and methods.  These may include fieldwork, interviews, laboratory experimentation, computer-based data analysis or library research as directed by the research award holder and will entail co-ordinating own work with that of others to avoid conflict or duplication of effort. Analysing and interpreting results of own research, under the guidance of research award holder or supervisor. Write up results and contribute to the preparation of papers for submission to appropriate journals and conferences, and other outputs as required and/or appropriate. Attend appropriate conferences for the purpose of disseminating research results of personal development.

Continually update knowledge and develop skills

To carry out routine administrative tasks associated with a specified research project, for example risk assessment of research tasks, organisation of project meetings and documentation.  This will entail planning own day-to-day research activity within the framework of the agreed programme, dealing with problems that may affect the achievement of research objectives and deadlines and implementing procedures required to ensure accurate and timely formal reporting and financial control

Demonstrating, or occasionally assisting with undergraduate supervision within the post holder's area of expertise and under the direct guidance of a member of the Faculty academic staff.

**Person Specification**

**The post holder must have:**

A first degree or a professional qualification or equivalent in a relevant subject.

At least part-completed a relevant doctoral degree or have relevant experience in a given field.

Whilst there is no requirement for previous work experience, the post holder will be expected to be able to support research activities by performing experiments and/or undertaking studies and analysing/ interpreting results.

**Relationships and Contacts**

Direct responsibility to the principal investigator or academic supervisor.

**Special Requirements**

To be available to participate in fieldwork as required by the specified research project.

**All staff are expected to:**

- Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities policy.

- Help maintain a safe working environment by:

    - Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand

    - Following local codes of safe working practices and the University of Surrey Health and Safety Policy

- Undertake such other duties within the scope of the post as may be requested by your Manager.

| **Addendum** |
| This document provides additional information relating to both specific aspects of the post/faculty and any post specific person specification criteria. The information contained within this document should always be read in conjunction with the accompanying generic Role Profile. |

| **Job Title:** | Research Assistant in machine-learning based structural health monitoring |

## Background Information/Relationships

The University of Surrey is a global community of ideas and people, dedicated to life-changing education and research.

We are ambitious and have a bold vision of what we want to achieve - shaping ourselves into one of the best universities in the world, which we are achieving through the talents and endeavour of every employee.

Our culture empowers people to achieve this aim and to collectively, and individually, make a real difference.

The University of Surrey is a short walk from Guildford town centre, adjacent to the Surrey Hills Area of Outstanding Natural Beauty, and 40 minutes by train from central London.

## Focus of the role

Applications are invited from talented and enthusiastic individuals to conduct world-leading research on developing data-driven indirect damage detection systems for railway bridges. The successful applicant will work on research investigation focused on developing a deep-learning-based damage identification system for railway bridges using signals from a passing train. In this system, a bridge's condition is assessed by analysing the data collected on a moving train while crossing the bridge, thus acting as an actuator to excite the bridge and as a sensor to record its response for a known excitation input.

The aim of the project is to develop a data-driven indirect damage detection system for railway bridges, using an instrumented vehicle to monitor and inspect the bridge while travelling at operational speed.

This project builds on a recent project with Network Rail and intends to extend the application of the system for metallic railway bridges using measurements on one of Network Rail's monitoring trains.

This post is offered on a fixed term contract with the end date of the project is 30 July 2023 with a potential for extension for another 6-12 months. The expected starting date is 12 February or earlier. Salary offered will be dependent on experience and qualifications.

## Skills/Experience and how applied

The successful candidates must hold an MEng/MSc in Engineering, Computer Science, Mathematics, Physics, AI or other relevant major degrees. They will bring strong domain knowledge in vehicle dynamics as well as signal processing, deep learning and self-supervised algorithms. Previous experience in defects identification system development and applying physics-informed ML and AI methodologies will be highly desirable.

With excellent written and oral communication skills and attention to detail, they will be proactive, keen to work in a multidisciplinary environment, and have experience in disseminating research findings in well-ranked journals. Experience in programming languages such as Matlab, Python or R is essential.

The successful applicant will use state-of-the-art experimental facilities across the Faculty of Engineering and Physical Sciences and interact with industrial and academic collaborators. They will be proactive, keen to work in a multidisciplinary environment, and have experience in disseminating research findings in well-ranked journals.

Please apply online and include:

- a curriculum vitae (including qualifications, and publications).

For informal enquiries please contact Dr Donya Hajializadeh at d.hajializadeh@surrey.ac.uk.

## Person Specification

This section describes the sum total of knowledge, experience & competence required by the post holder that is necessary for standard acceptable performance in carrying out this role. This is in addition to the criteria contained within the accompanying generic Role Profile.

| | Essential/ Desirable |
| --- | --- |
| Digital Signal processing and cleaning | Essential |
| Transfer learning using pre-trained algorithms | Essential |
| Building and training deep-learning algorithms | Essential |
| Excellent technical verbal and written communication skills. | Essential |
| knowledge/background in foundation models and/or new generation of self-learning algorithms | Desirable |
| Dynamics (vehicular, structural, VBI, TTB) | Desirable |
| | Desirable |
| | |

## Key Responsibilities

This document is not designed to be a list of all tasks undertaken but an outline record of any faculty/post specific responsibilities (5 to 8 maximum). This should be read in conjunction with those contained within the accompanying generic Role Profile.

**N.B. The above list is not exhaustive**.