Research Role Profile and Job Purpose Addendum

Job Title:	Research Fellow A

Responsible to:	Head of research group, or principal investigator

Responsible for:	Not applicable

Job Summary and Purpose:

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

Main Responsibilities/Activities

To undertake a range of research activities within a specified research area, assuming responsibility for specific areas of projects and making use of new research techniques and methods, in consultation with the research award holder or supervisor. This may include software development, fieldwork, interviews, laboratory experimentation, critical evaluation and interpretation, computer-based data analysis and evaluation or library research.

Using initiative and creativity to identify areas for research develop new research methods and extend the research portfolio. Analysing and interpreting results of own research. Write up results and prepare 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. The post holder may also contribute to writing bids for research grants and will contribute to collaborative decision making with colleagues in areas of research.

Continually to update knowledge and develop skills, and translate knowledge of advances in the area into research activity.

To plan and manage own research activity in collaboration with others. To carry out administrative tasks associated with specified research funding, for example risk assessment of research activities, organisation of project meetings and documentation. Implementation of procedures required to ensure accurate and timely formal reporting and financial control.

To contribute to teaching in the Faculty by carrying out student supervision and/or demonstrating within the post holder's area of expertise and under the direct guidance of a member of departmental academic staff, as appropriate.

The post holder may occasionally be required to supervise more junior research staff.

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Person Specification
The post holder must have:
A doctoral degree in a relevant discipline (although individuals who have almost completed a doctoral degree may be appointed). Consideration may also be given to individuals who do not hold a doctoral degree but have required skills based on a number of years experience in specified / relevant fields
The post holder will have authority over some aspects of project work and must be capable of providing academic judgement, offering original and creative thoughts and be able to interpret and analyse results.

Relationships and Contacts
Direct responsibility to the principal investigator or academic supervisor. The post holder may be asked to serve on a relevant Faculty committee. There may be additional reporting and liaison responsibilities to external funding bodies or sponsors. The post holder may work on original research tasks with colleagues in other institutions.

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 Fellow in Software Engineering

Job Purpose and Summary

(i) Design and develop tools for automatic program transformation. These tools should change client code automatically to use newer versions of a software library.

(ii) Collaborate with other collaborators and project partners to develop pilot and proof-of-concept tools.

(iii) Report orally and prepare papers reporting progress and delivery of project outcomes and be able to communicate at both technical and high-level, for example with project research partners.

(iv) Perform any other duties associated with the project, as deemed appropriate to the grade by the Principal Investigator.

Main Responsibilities/Activities

Support the Principal Investigator of the MUSE project (details in Background section) in achieving the goals of that project.

Undertake the development of datasets and research outputs for MUSE.

Take responsibility for elements of the planned research, plan and carry out a work programme appropriate to the research activity.

Meet on a weekly basis on campus with project staff and PhD students.

Contribute to the writing of research grants.

Attend project meetings and present results at other sites as required.

Give oral and written reports on project progress and outcomes.

Contributing to dissemination and publication of personal and/or research teams findings as appropriate.

Continually update knowledge and develop skills

Carry out routine administrative tasks associated with a specified research project, for example 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 delivery.

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
PhD (gained or near completion) or equivalent professional experience in Software Engineering, or a related discipline.	Essential
Research experience in topics relevant to the research project, such as state-of-the-art software engineering techniques.	Essential
Strong programming skills; experience with Compilers, Symbolic or Data-driven Static Analysis and Program Transformation tools	Essential
Experience and evidence of effective independent research work within a team. More broadly, demonstrated ability to plan and execute a research project, solve problems independently, and make original contributions to a research field.	Essential
Experience of working with LLMs, multi-GPU inference and training, parameter-efficient fine-tuning, and machine learning	Desirable
Experience in software development and creation of web-based tools and systems	Desirable
A track record of publishing academic papers, open-source software tools and/or research datasets.	Desirable

Background Information
This should be read in conjunction with those contained within the accompanying generic Role Profile.

To build large and sustainable software systems, it is crucial that independently evolving software systems are synchronised automatically. Multi-Modal Software Evolution (MUSE) is a transformative step towards autonomous software maintenance where directives in software documentation for human developers will guide automated software upgrade. In MUSE, we will develop a novel approach to software upgrade that integrates upgrade directives for human developers into formal frameworks for program synthesis, generation and repair. We will include directives in documentation for libraries as first class objects in frameworks for reasoning and transformation of software. We will produce hybrid statistical-formal reasoning frameworks which will make human-to-human communication the main driver in automatic program transformation.

Working closely with stakeholders through engagement events, we will develop both the theory and the tooling for automatic software upgrade to use newer versions of

libraries. We will demonstrate the tools by upgrading client software that relies on fast-moving libraries and distribute the tools that we develop in multiple forms for developers at all skills levels, from enthusiasts to experienced developers, making our outputs widely accessible.

The successful applicant will investigate and reduce the impact of rapidly evolving libraries on maintainability of their clients. They will build automated tools to update clients to use newer versions of libraries. The post is funded by EPSRC and some details of the project can be found here: https://gtr.ukri.org/projects?ref=EP%2FW015927%2F2

Relationships and Contacts

Direct responsibility to the academic supervisor, Santanu Dash. The postholder will also work with the other collaborators, with project partner academics and developers.

N.B. The above list is not exhaustive.