Research Assistants (DevOps)

Role Description

GRADE

Grade 4

LOCATION

Merchiston, Edinburgh

LINE MANAGER
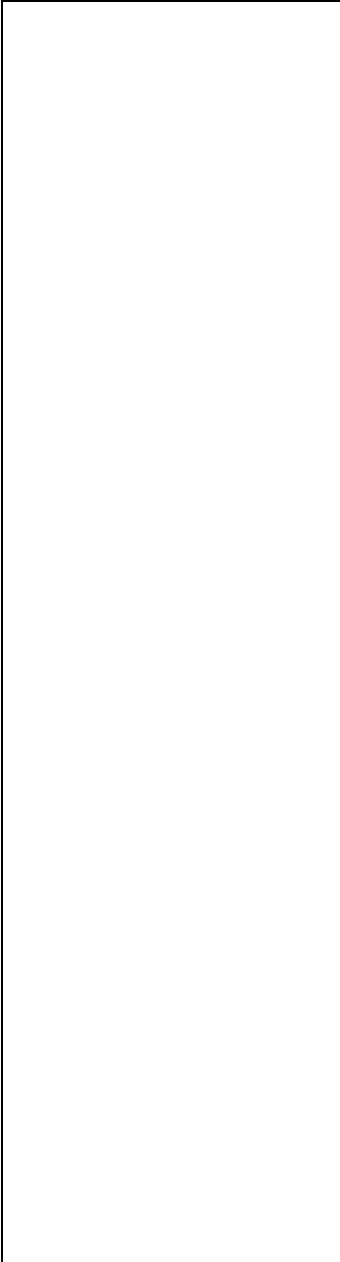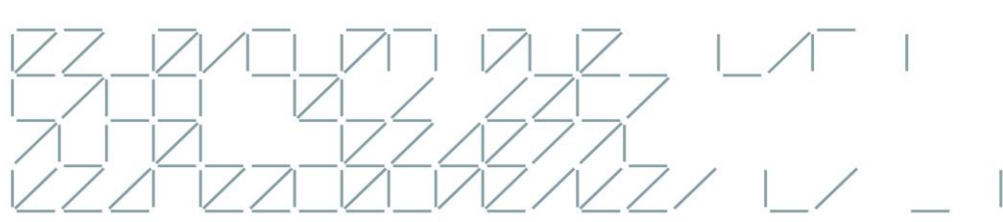
Prof. Berk Canberk

Role Summary

We have two posts available for Research Assistants to work part-time on a project for Interoperable Interface Design for a Digital Twin as a Service (DTaaS) Platform.

A Digital Twin (DT) is a virtual replica of a physical system/entity/process that can monitor the digital environment, perform analysis, and apply optimisation in real time. With this, there are opportunities to provide insights into system performance and ongoing operations and allow for predictive maintenance, enhanced decision-making, and improved efficiency.

There has been research in different domains, such as manufacturing, smart cities, transportation, and communication however, for their effective adaptation, there is a need for an efficient, scalable, and interoperable DT platform.

A Digital Twin as a Service (DTaaS) platform integrates DT technologies into cloud services and offers an automated perspective on creating DTs.

This platform is being built using microservice-based architecture in a private cloud environment.

Under this project, one Research Assistant will work on interface design of DTaaS, while the other will work on data integration and visualisations.

Interface Design:

One of the available positions will involve implementing an interoperable interface for seamless integration of DTs. The postholder will work on the platform's back end and design the data abstraction layer using object relational mapper and develop the application layer interfaces (APIs) using open-source codebases.

Moreover, the scalability of the DT interfaces in microservice-based architecture using artificial intelligence / machine learning will be researched.

Data Integration and Visualisations:

The other role involves implementing data pipelines that can connect various data sources (public APIs, databases, IoT devices) and operate with different data formats (JSON, XML, Protobuf).

For this, the postholder will work on the platform's front end, design data schemas and their versioning, and implement the graph ontologies using open-source codebases. Moreover, the artificial intelligence / machine learning integration into the data management will be researched.

Both Research Assistants will work as part of the diverse and collaborative research group that Prof. Berk Canberk supervises (bcrg.uk).

Line Management Responsibility for:

This role does not have any line management responsibilities currently.

Main Duties and Responsibilities

Teaching and Learning Support

- Could be expected to assist in the supervision of undergraduate student projects.

Research and Scholarship

- Undertake basic research for example by preparing, setting up, conducting and recording the outcome of experiments and field work, the development of questionnaires and conducting surveys.
- Support the development of undergraduate project proposals
- Conduct literature and database searches.
- Write up results as project report
- Continue to update knowledge and develop skills.

Communication

- Write up results of own research, as part of a guided process
- Contribute to the production of research reports and publications.
- Present information on research progress and outcomes to bodies supervising research, e.g. steering groups.
- Prepare papers for steering groups and other bodies.

Liaison and networking

- Liaise with research colleagues and support staff on routine matters.
- Make internal and external contacts to develop knowledge and understanding and form relationships for future collaboration.

Managing people

- Provide guidance as required to support staff and any students who may be assisting with the research.

Teamwork

- Actively participate as a member of a research team.
- Attend and contribute to relevant meetings.

Pastoral care

- Show consideration to others.

Initiative, problem-solving and decision-making

- Make use of standard research techniques and methods.

- Deal with problems which may affect the achievement of research objectives and deadlines
- Contribute to decisions affecting the work of the team.
- Analyse and interpret the results of own research and generate original ideas based on outcomes.

Planning and managing resources

- Plan own day-to-day research activity within the framework of the agreed project.
- Co-ordinate own work with that of others to avoid conflict or duplication of effort.
- Contribute to the planning of research projects.
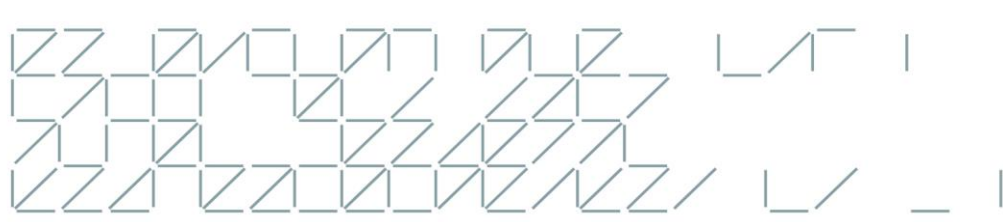
Sensory, physical and emotional demands

- Sensory and physical demands will vary from relatively light to a high level depending on the discipline and the type of work
- Carry out tasks that require the learning of certain skills.

Work environment

- Is required to be aware of the risks in the work environment.

Expertise

- Possess sufficient breadth or depth of specialist knowledge in the Computer Science discipline with an undergraduate or Master's degree and be developing further skills in and knowledge of research methods and techniques.
- Role model the University's values & behaviours.
- Be responsible for ensuring that the information and records processed (received, created, used, stored, destroyed) on behalf of the University are managed in compliance with ALL applicable legislation, codes and policies e.g. Data Protection, Information Security and Records Management.

PERSON SPECIFICATION

	ESSENTIAL	DESIRABLE
Education / Qualifications		
• Undergraduate or Masters Degree in Computer Science/Computer Engineering	✔	
• PhD in relevant subject or working towards completion		✔
Skills / Experience		
• Programming in Python and Go (Interface Design) or Python and JavaScript (Data Integration and Visualisations)	✔	
• Enthusiasm for exploring Digital Twins	✔	
• AI/ML algorithms	✔	
• Computer Communications and Networking	✔	
• TCP/IP Protocol Stack	✔	
• Databases Systems	✔	
• Knowledge in API or React Language		✔