

Research Assistant/Associate in IoT and Digital Twins

REQ250007

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

The role involves working on a research and development project funded by the Innovate UK in close collaboration with industry project and international partners as well as researchers within the School of Computer Science. The project aims to research and develop a novel digital twin framework called the Internet of Digital Twin Things (IoDT2). This framework will allow for the easy sharing of models and data across networks, and computation resources can dynamically be formed to execute simulations. Each model can be instantiated at edge, fog, or cloud level where it exchanges data with other models, performs simulations, and returns results. This will enable practitioners to focus on creating necessary core models for their systems instead of being bogged down by complex software configuration.

The appointee will be based in the Department of Computer Science at Loughborough University.

Job Description

Job Grade: Specialist and Supporting Academic Grade 5/6

Job Purpose:

To conduct collaborative research in the areas of distributed artificial intelligence (AI) and digital twin networking, focusing on the development of innovative solutions for the Internet of Digital Twin Things (IoDT2) project. The research involves creating a digital-twin centric network (DTCN) based on information-centric networking (ICN) principles, enabling the efficient sharing of AI models, simulation results, and data across various digital twins at different levels (discrete, partially composite, fully composite). The role includes contributing to the design and implementation of secure and scalable distributed digital twin architectures, ensuring compatibility with open standards and the integration of AI technologies for optimised decision-making in various applications.

Job Duties:

To conduct research on the project described above. This will involve a combination of individual work and collaborative work.

For the appointment of Research Assistant (SSA Grade 5):

- To carry out research according to the objectives stated in the research proposal
- Help with preparing the project deliverables
- To meet regularly with the PI, to discuss the progress of the project, and to report the findings of research undertaken individually
- Contribute to writing scientific papers

- Comply with University Health and Safety Policy
- Comply with University Rules and Regulations

For the appointment of Research Associate (SSA Grade 6):

- To undertake a literature review and produce a taxonomy of state-of-the-art distributed digital twin frameworks
- To evaluate the efficiency of distributed digital twin frameworks
- To research and develop a novel distributed digital twin frameworks
- To prepare research publications of results arising from the project
- To take part in relevant research related activities within the Department of Computer Science. This may include both taking part and delivering research seminars
- To participate in appropriate international conferences and, to contribute to the dissemination strategy of the project, present research findings. This may include giving a talk, presenting a poster, as well as holding discussions with other conference participants
- To meet regularly with the PI, to discuss the progress of the project, and to report the findings of research undertaken individually
- Be responsible for conducting the day to day running of the project
- To formulate detailed plans for the project based on broad guidance from the PI
- To feed back to the PI on progress, to make recommendations for next steps
- To maintain confidentiality at all times and ensure that intellectual property (IPR) agreements are not violated
- To assist the academic staff in the project team with the supervision of undergraduate MSc and PhD project work and day to day supervision and support of other researchers
- To engage in training programmes in the University (or elsewhere) that are consistent with the needs and aspirations of the project and those of the Department
- To undertake other duties as may be reasonably requested and that are commensurate with the nature and grade of the post
- Comply with University Health and Safety Policy
- Comply with University Rules and Regulations

Points To Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

Organisational Responsibility

Reports to the Director of the MLSC

Person Specification

Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

- 1 – Application
- 2 – Test/Assessment Centre/Presentation
- 3 – Interview

Essential Criteria

For the appointment of Research Assistant (SSA Grade 5):

Area	Criteria	Stage
Experience	Background in Computer Science or <i>relevant disciplines</i>	1,
	Problem solving using computer science techniques	1, 2, 3
	Software development on Linux/Unix platforms	1, 2, 3
Skills and abilities	Good programming skills in any programming language	2, 3
	Excellent written and oral communication skills	1, 2, 3
	Self-motivated with ability to meet deadlines	2, 3
	Excellent interpersonal, and organisational skills	2, 3
	Working knowledge of open-source software packages	2, 3
Qualifications	Holding or working towards a postgraduate degree in computer science or <i>relevant disciplines</i>	1, 3
Other	Commitment to observing the University's Equal Opportunities policy at all times	1, 3

For the appointment of Research Associate (SSA Grade 6):

Area	Criteria	Stage
Experience	Background in Computer Science or <i>relevant disciplines</i>	1, 3
	Problem solving using computer science techniques	1, 2, 3
	Software development on Linux/Unix platforms	1, 2, 3
Skills and abilities	Authoring original work for academic journal papers, conference papers or technical reports	1, 2, 3
	Good analytical research skills	2, 3
	Good programming skills in any programming language	2, 3
	Excellent written and oral communication skills	1, 2, 3
	Self-motivated with ability to meet deadlines	2, 3
	Excellent interpersonal, and organisational skills	2, 3
	Working knowledge of open-source software packages	2, 3
	Working knowledge of specific optimisation methods/algorithms	2, 3
	Ability to write project reports and make technical presentations to industrial and academic research groups	2, 3
	Knowledge of relevant Health & Safety issues	3

Qualifications	For Grade 6 appointment: PhD (or near completion) in computer science or <i>relevant disciplines</i>	1
Other	Commitment to observing the University's Equal Opportunities policy at all times	1, 3

Desirable Criteria

For the appointment of Research Assistant (SSA Grade 5):

Area	Criteria	Stage
Experience	Research experience in one or more of the following areas: Network management, edge computing, serverless computing, AI and machine learning	1, 2, 3
	Software development in Kubernetes /Docker or similar tools	1, 2, 3
Skills and abilities	Agile software development, validation and evaluation	1, 2, 3
Qualifications	Holding or working towards a postgraduate degree in computer science or <i>relevant disciplines</i>	1
Other	Able to travel Independently	1, 2, 3

For the appointment of Research Associate (SSA Grade 6):

Area	Criteria	Stage
Experience	Research experience in one or more of the following areas: Network management, edge computing, serverless computing, AI and machine learning	1, 2, 3
	Software development in Kubernetes /Docker or similar tools	1, 2, 3
	Developing proposals for funding from external agencies	1, 2, 3
	Working in a high quality academic research environment	1, 2, 3
	Experience of teaching and/or supervision of students in relevant areas	1, 3
Skills and abilities	Authoring original work, in the highest quality refereed academic journals	1, 2, 3
	A strong publication track record	1
	Agile software development, validation and evaluation	1, 2, 3
Qualifications	PhD (or near completion) in computer science	1
Other	Able to travel Independently	1, 2, 3

Conditions of Service

This appointment will be a **full time, fixed term for 23 months for SSA Grade 6 or 24 months for SSA Grade 5**. Salary is SSA Grade 5 or 6 (£28,879 - £33,882 or £34,866 – £45,163 per annum), at a starting salary commensurate with experience and qualifications, to be confirmed on offer of appointment.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff, details of which can be found [here](#).

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which are available at <http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure--page.html>.

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/az/childcareinformation---page.html>)

In addition, the University is supportive, wherever possible, of flexible working arrangements. We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. The Department of Mathematics Education, together with the Department of Mathematical Sciences, holds a Silver Award. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>

Informal Enquiries

Informal enquiries should be made to **Dr Posco Tso** by email at p.tso@lboro.ac.uk.