

Senior Research Associate - Next Generation Visualization Platform for Aerospace Manufacturing Operations

Job Ref: REQ240136

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Job Description

Job Grade: Specialist and Supporting Academic Grade 7

Project Description

This project involves developing new interactive visualization tools based on Extended Reality (including Augmented and Mixed Reality) to aid human operators perform complex assembly tasks (such as drilling, fastening, quality inspection, worker task completion and remote collaboration) at the point of operation). The goal is to help deliver significant operational benefit in terms of reduced rework and increased production rate for the manufacture of large components such as commercial aircraft wings.

The project will have access to smart network-enabled assembly tooling and integration of Industry 4.0 technologies including, Internet of things, artificial intelligence, augmented reality, machine learning, and other information technologies.

The research will involve integrating with coupled sensor networks (provided by a project partner) as part of the factory infrastructure to enable effective interaction through multimodal interfaces and techniques to overcome system latencies whilst enabling greater accuracy. The use of new smart assembly tools will create significant opportunities to process live data streams by novel analytical methods. The very latest state of art Extended Reality displays will be available to support the research. The goal is to enable the use of a range of Extended Reality displays through a common 'plug and play' visualization tool.

Job Duties

Research

- To lead scientific and technological research into new advanced assistive visualization technologies.
- To be responsible for capturing use cases across the whole project at various time points with a view to understanding the requirements for an interactive visualization system that supports different manufacturing processes as the research evolves.
- To lead the definition of the visualization framework for the information/data architectures to facilitate data connectivity between sensors, digitally enabled tooling and the Airbus digital data backbone.
- To develop and manage a system to provide a ubiquitous interface (device independent) to a range of XR (Extended Reality also known as Augmented, Mixed, and Virtual Reality) technologies thus making it easier to integrate future XR solutions in the future.
- These devices will include intelligent smart glasses and Mixed Reality systems such as the Apple Vision Pro
- To work with other Loughborough RAs funded by Airbus
- To work collaboratively with the project's industry and academic partners
- To assist in other related engineering research projects as required.

- To carry out literature reviews, to write up technical reports and technical papers for publication of the results obtained and the generation of research posters and other publicity media.
- To make technical presentations at project meetings.
- To lead, plan, manage and conduct the work to agreed deadlines.
- To assist in guiding and training postgraduate research students.
- To assist in developing new lines of research and the writing of research proposals.
- To maintain close contact with research project sponsors and make technical presentations.
- To maintain confidentiality where appropriate and to ensure that intellectual property (IP) agreements are met.
- To identify and report new opportunities for IP generation.
- Where necessary, to spend short periods of time travelling in the UK and overseas.
- Travel to Airbus and project partners and other organisations on an ad-hoc basis.

Teaching

- Teaching is not the primary purpose of this post but if the applicant wishes to broaden their skill there will be opportunities to support teaching on taught programmes and student projects, at any level, if appropriate..

Other Related Activities and Functions

- To engage in training programmes in the University (eg through Professional Development) and elsewhere as required.
- To undertake such other duties as may be reasonably requested and that are commensurate with the nature and grade of the post.

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 Project Investigator, Professor Roy S. Kalawsky

Person Specification

Your application will be reviewed with respect to meeting the essential and desirable criteria listed below. 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

Area	Criteria	Stage
Experience	The conducting of original research that can be, or has been published in high quality journals	1, 3
	Experience (not novice) of advanced modelling, simulation techniques and visualization	1, 3
	Project planning	1, 3
	Competence in a modern computing language ideally as a programmer eg Python or other modern computing language	1, 3
	Competent IT/ Internet user	1, 3
Skills and abilities	Demonstration of excellent technical ability	1, 2, 3
	Excellent inter-personal and communication skills - both written and oral	3
	Excellent team-working skills	3
	Excellent research paper or report writing skills	1, 3
	Highly-motivated with the ability to set and meet deadlines appropriate to the progress of the project	1, 3
Training	A willingness to undertake further training as appropriate and to adopt new procedures as and when required	3
Qualifications	A 2:1 Engineering degree or preferably a PhD degree (or approaching completion of a PhD) in engineering, or relevant computing subject	1
Other	Willingness to travel	3
	Commitment to observing the University's Equal Opportunities policy at all times	3

Desirable Criteria

Area	Criteria	Stage
Experience	Equipment purchasing/budgeting	1, 3
	Project management/leadership experience	1, 3
	Computer aided design techniques for mechanical systems	1, 3
	Experience with visualization techniques	1, 3
Skills and abilities	Knowledge of aerospace engineering	1, 3
	Track record in originating and developing new ideas	1, 2, 3

	Relevant industrial experience	1, 3
	Interest in aerospace	1, 3
	Interest in systems engineering	1, 3
Qualifications	Relevant postgraduate research qualifications or industrial experience in any one of the following areas: <ol style="list-style-type: none"> 1. Aerospace design; 2. Applied modelling and simulation; 3. Model-based systems engineering; 4. Computer science (programming) 5. Relevant subjects in computing, physics, materials science or mechanical engineering 	3

Conditions of Service

The position is FULL-TIME and FIXED TERM until 31 December 2025. Salary will be on Specialist and Supporting Academic Grade 7 (£45,585 to £54,395 per annum), at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's Terms and Conditions of Employment for STAFF GRADES 6 AND ABOVE, 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>.

The University offers a wide range of employee benefits which can be found [here](#).

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. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>