Wolfson School of Mechanical, Electrical and Manufacturing Engineering

Loughborough University

Research Associate in Advanced Assistive XR (Augmented, Mixed, and Virtual Reality) Visualization for Aerospace Manufacturing Operations

Job Ref: REQ250998

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.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 Wolfson School of Mechanical, Electrical and Manufacturing is one of the leading Engineering Schools in the country. With a strong tradition in Manufacturing and in the discovery and application of Materials for applications in a broad range of industrial sectors (e.g. electronics, bioengineering & healthcare, automotive, food industry, etc), we strive for academic excellence and research at the leading edge.

Project Description

Digitally Enhanced Low-cost Technology for Aerostructures (DELTA) is a £20m multi-institutional InnovateUK Programme, co-funded by Airbus and a consortium of Industrial Collaborators. The project involves development of new approaches to develop novel digital engineering and manufacturing techniques for the purpose of providing advanced visual displays to support smart assembly tooling for the manufacture of large components, such as commercial aircraft wings. Research is developing advanced assistive visualization solutions involving eXtended Reality (XR), also known as augmented, mixed, and virtual reality to provide 'at point of operation' information overlays. The goal is to assist/guide operators to perform difficult manual tasks by projecting spatially aligned information/graphical overlays with virtual target markers onto large scale manufactured components.

Job Description

Job Grade: Specialist and Supporting Academic Grade 6

Job Purpose

To conduct research in Augmented Reality to assist/guide operators to perform difficult manual tasks associated with large scale manufactured components by providing spatially aligned information/graphical overlays and virtual target markers. To design and implement software using Unity to generate displays for next generation advanced assistive visualization systems for factory deployment. You will have an opportunity to work on the World's very best augmented reality display. To support generation of high-quality scientific reports and papers suitable for publication in International Journals. To work as part of a multidisciplinary team across several institutions and companies. To work as part of a multidisciplinary team across several institutions and companies.

Job Duties

Research

- To design, develop, adapt and test software in the Unity toolset to facilitate augmented reality displays and user interfaces.
- To research into requirements capture for advanced assistive visualization systems as applied to complex manufacturing processes (incl. new approaches) and their applicability for smart assembly tooling for the manufacture of large components, such as commercial aircraft wings
- To conduct research of academic rigour and scientific standard, carry out authoritative literature reviews, and publish in top quality journals, consistent with the quality and ambition of the School.
- To apply experience in the representation of complex task-based information displays 'at point of operation'
- To display key task/process parameters associated with smart tooling through interactive modes

- To support usability evaluation of AR techniques for the interrogation of these models
- To support use case analysis underpinning the use of novel information displays withing a real factory environment
- To support the design of the underpinning information architecture comprising AR, associated spatial tracking and assistive information displays
- To develop enabling software code using Unity for the DigiLens ARGO display device
- To liaise with academic and industrial project partners and manage and plan activities across the project team.

General, technical

- Write up regular progress reports and present outcomes to all Investigators and Collaborators (incl. those located at other Institutions), making recommendations for next steps.
- To support the project team by enhancing relationships with existing collaborators and by assisting the establishment of relationships with new collaborators.
- Travel to external partners and collaborators to undertake experimental trials, attend meetings and make presentations, when required.
- To attend and contribute to conferences.
- To contribute to project promotion and public engagement events.
- Contribute ideas for new research and enterprise directions.

General, Administrative

- Maintain confidentiality (especially commercially sensitive information/data) at all times and ensure that intellectual property (IPR) agreements are not violated.
- To work as part of a multi-disciplinary, multi-location team that addresses different aspects of the design, manufacturing, test/validation cycle.
- To work effectively with relevant administrative, technical and academic staff in the School and across the University.
- To engage in training programmes in the University (e.g. through Staff Development) which are consistent with the RA's ongoing professional development, and the needs and aspirations of the project team and those of the School.
- 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.

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. Training will be provided as necessary and in support of the Researchers' professional development, and an attitude for learning will be an essential criterion in the selection of a successful candidate.

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.

Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. It is highly recommended that the candidates express in their Cover Letter how they fit to the Job Purpose and Job Duties described above. Stages of assessment are as follows:

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

Essential Criteria

	Criteria	**Stage**
Experience	Experience within a high-quality research or development environment	1, 3
	Supporting original work for academic journal papers, conference papers or technical reports	1
	Using own initiative to identify areas for research, developing new research methods and extending the research portfolio	1, 3
	Competence in modern computing language eg Python, C or AR/VR development environments -specifically Unity (Not novice level)	1, 3
	Experience of using CAD, CAE and other engineering modelling tools	1,3
Skills and abilities	Ability to work independently and also as part of a team, interacting with different academic and industrial partners	1,3
	Ability to write project reports and make technical presentations to industrial and academic research groups	1, 3
	Excellent written and oral communication skills in English	1, 2, 3
	Self-motivated, attention to detail and a flair for meeting the project(s) objectives and deadlines	1, 3
	Excellent interpersonal and organisational skills	1, 3
	Skills in finding information in the scientific literature and proposing original ideas	1,3
	Knowledge of relevant Health & Safety issues	1, 3
Training	Evidence of having undertaken further training and a willingness to be trained if necessary to fulfil the requirements of the job	1, 3
Qualifications	PhD in Mathematics, Physics, Engineering, Computer Science or related discipline	1
Other	Commitment to observing the University's Equal Opportunities policy at all times.	3
	Commitment to maintain confidentiality, where relevant, at all times	1,3

Desirable Criteria

Area	**Criteria**	**Stage**
Experience	Experience of designing user interfaces	1, 3
	Knowledge of advanced visualization techniques, ideally involving Extended Reality (XR)	1, 3
	Development of digital representations for novel manufacturing techniques.	1, 3

	Experience of teaching and / or supervision of students in relevant areas	1, 3
	Dealing with problems which may affect the achievement of research objectives and deadlines	3
Skills and abilities	Understanding of human factors methodologies as a framework to inform product and system development	1, 3
	A self-starter who can operate effectively with minimal supervision	3
Other	Travel / Able to travel Independently / Willing to work flexibly	1, 3

Conditions of Service

There is a position that is FULL TIME and FIXED TERM until 30 June 2026. Salary will be on Specialist and Supporting Academic Grade 6 (£35,608-46,049 per annum) at a starting salary 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/Operational and Administrative 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/a-z/childcare-information---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. For further information on Athena SWAN see http://www.lboro.ac.uk/services/hr/athena-swan/