Wolfson School of Mechanical, Electrical and Manufacturing Engineering

Loughborough University

Research Associate in Multi-Sensor Metrology

Job Ref: REQ171225

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Applications are invited for a Research Associate position, on the topic of multi-sensor measurement systems, based in the Intelligent Automation Research Group, part of the Wolfson School of Mechanical, Electrical and Manufacturing Engineering, Loughborough University. The research group (https://www.intelligent-automation.org.uk/) has an outstanding international reputation in performing multi-disciplinary research into advanced future automation technology to support challenging manufacturing applications. The engineering Schools at Loughborough have outstanding research facilities second to none. Loughborough University is committed to achieving equality and valuing diversity in all aspects of employment and welcomes applications from all sections of the community.

Job Description

Job Grade: Specialist and Supporting Academic Grade 6, fixed term to 31 July 2019

Job Purpose

This post is funded by the Engineering and Physical Sciences Research Council (EPSRC), the UK's main agency for funding research in engineering. The project will make use of a newly commissioned £400k state-of-the-art human-robot interaction environment. This has been specifically designed to provide the necessary data to support future advanced industrial automation systems, and it includes a network of high resolution machine vision cameras, high-speed reflective marking tracking cameras, safety control zone sensors and two high accuracy mobile optical CMM systems. The Research Associate will be responsible for investigating how these different systems can be integrated in a collaborative way to form an enhanced universal measurement system. The aim is that this system will make use of the available network of sensors and instruments to track and measure the position of objects, machines and people within the human-robot interaction environment. The Research Associate will be working as part of a multi-disciplinary team to manage and deliver the project, working closely with manufacturing engineers, automation engineers, robotics engineers, and metrologists.

Job Duties

Research

The work entails, primarily, the following activities under the direction and supervision of Dr Peter Kinnell:

- To develop an integrated large volume measurement environment, that is able to combine data from machine vision cameras, with other large volume metrology systems, in a useful and beneficial way.
- To define test strategies to investigate the limits, capability, and performance of various large volume metrology systems that might be used for the tracking and measurement of people, parts, or machines with a manufacturing environment.
- To develop appropriate integration software that allows data from different measurement systems, sensors, and instruments to be automatically acquired, logged, analysed and combined.
- To plan, manage and conduct the work to agreed deadlines.
- 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 work as part of a cross-university team interacting and supporting colleagues from different departments as appropriate.
- To assist in guiding and training postgraduate research students.
- To assist in managing research projects.
- To assist in other related engineering research projects as required.
- To assist in developing new lines of research and the writing of research proposals.
- 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.

Teaching

Teaching is not the primary purpose of this post and teaching load will be small relative to the typical load of a member of academic staff in the School, but the Research Associates will be expected to contribute to taught programmes and student projects, at any level, if appropriate and if requested to do so.

Other Related Activities and Functions

- To engage in training programmes in the University (e.g. 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 investigators named above.

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 – Telephone interview/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
	Good understanding of principles of metrology within a manufacturing or industrial context	1, 3
	Experience in using large volume metrology systems.	1, 3
	Experience with machine vision systems	1, 3
Skills and abilities	Demonstration of excellent technical ability	1, 2, 3
	Excellent inter-personal and communication skills - both written and oral.	3
	Programming/Coding in a range of languages (e.g. C, C#, C++, MATLAB)	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 good honours degree in mechanical/materials engineering, or other relevant subject	1
	A relevant PhD degree (or approaching the completion of a PhD degree) in any one of the following areas: 1. Large Volume Metrology 2. Machine Vision 3. Multi-sensor measurement systems 4. Other relevant subjects	1,3
Other	Ability to work on own initiative and as part of a team	3
	Commitment to observing the University's Equal Opportunities policy at all times	3

Desirable Criteria

Area	Criteria	Stage
Experience	Post-doctoral research in large volume metrology, ideally applied to manufacturing or robotics applications	1, 3
	Knowledge of creating multi-camera measurement systems using photogrammetry or stereo imaging	1, 3
	Experience of using the following systems: Nikon K-CMM and Vicon	1, 3
	Experience of designing and making high precision machines and	1,3

	artefacts for metrology applications	
Skills and abilities	Track record in originating and developing new ideas	1, 3
	Excellent mathematical and data analysis, e.g. machine learning skills	1,3
	Public engagement: eg participation in conferences, STEM ambassador, etc	1, 2, 3

Conditions of Service

This position is full time, fixed term to 31 July 2019. Salary will be on Specialist and Supporting Academic Grade 6 (£29,799 - £38,833 per annum), at a starting salary commensurate with experience and qualifications and 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/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/

Informal Enquiries

Informal enquiries should be made to Dr Peter Kinnell, Senior Lecturer in Metrology, Wolfson School of Mechanical, Electrical and Manufacturing Engineering by email at P.Kinnell@lboro.ac.uk or by telephone on +44 (0)1509 227146.

Applications

The closing date for receipt of applications is **21st January 2018.** Interviews will be held in **the week commencing 29th January 2018**.