Loughborough University

Post Doctoral Research Associate in Machine Learning for Robotics
REQ17642

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.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

You will work on a Newton Fund project to develop a companion robot to assist walking, sitting down and standing up for older people. You will work with four consortium partners including Loughborough, Motion Robotics Ltd, SIAT of Chinese Academy of Sciences, and Shenzhen Casun Intelligent Robot Co.Ltd. The project will develop a robot that will combine important features: physically assist locomotion, providing companionship and stimulating the user's mind. It will help support the user to walk both indoors and outdoors. Using an innovative variable wheelbase it is useable in cramped spaces yet providing heavy support when getting in and out of chairs.

We are looking for a Postdoctoral Research Associate (PDRA) in robot learning and control area. The PDRA will focus on dynamic balance control of a three-legged robot.

Candidates are expected to have a PhD in robotics, machine learning, or a related topic, or equivalent experience. Embedded programming skills in C/C++ or any mechatronics practical experience are highly desirable.
Any experience in any of the following areas would be advantageous: reinforcement learning, deep learning, multichannel signal processing, and bipedal robot balance control.

The post holder will work within the Department of Computer Science at Loughborough University under the supervision of Dr Qinggang Meng. He will close work with other researchers and engineers in the project consortium from both academia and industry.

Job Grade: Specialist and Supporting Academic Grade 6

Job Purpose
To develop and implement dynamic balance control algorithms for a highly reconfigurable three-legged robot; to integrate the developed robot balance control algorithms into the robot control system; to evaluate the developed system in simulation and on a real robot system.

Job Duties

- To develop and implement dynamic balance control algorithms for a three-legged robot.
- To develop and implement algorithms to process multi-channel sensory information to assess the current robot balance situation.
- To develop and implement robot falling recovery strategies.
- To integrate the developed algorithms into the robot control system.
- To conduct simulation to test the developed methods and software.
- To implement the developed algorithms on a real robot and evaluate it in a lab environment under different situations.
- To conduct end user evaluation of the developed system.
- To collaborate and work with other research staff, the investigators and industrial partners.
- To write reports, conference and journal papers on the research outcomes and make presentations on the work to present to academic and other partners.
- To undertake such other duties as may reasonably be 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

Academic Principle Investigator – Dr Qinggang Meng

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

Area	Criteria	Stage
Experience	Experience in robotics or a related topic	1, 3
	Experience in C/C++ programming	1.3
	Experience in carrying on theoretic study using mathematically sound approaches	1 , 3
	Experience working in an academic or industrial research environment	1,3
Skills and abilities	An appreciation and understanding of real world requirements in robot applications	3
	Ability to communicate complex technical concepts and requirements	1,3
	Record of presentation at International conferences and publication in International journals	1
	Ability to work independently and as part of a cross-disciplinary team	1,3
	Ability to design and develop robot control algorithms	1,3
	Ability to take part in collaborative activities	1,3
	A demonstrated ability to write research papers and reports of high quality and make technical presentations to industrial and academic research groups	1,3
Training	Willingness to undertake training when necessary	3
Qualifications	A 2.1 or higher first degree in engineering or computer science	1
	PhD in robotics, machine learning or a related topic	1
Other	Evidence a good working knowledge of equal opportunities and understanding of diversity in the workplace	3

Desirable Criteria

Area	Criteria	Stage
Experience	Dynamic balance control of legged robots	1,3
	Experience in reinforcement learning or deep learning	1,3
	Experience in multichannel signal processing	1,3
	Experience in robot dynamics and control	1,3
	Experience in robot falling down prediction and recovery	1,3
Skills and abilities	Strong knowledge in robot dynamics	1,3
	Robot modelling in ODE	1,3
	Strong programming skills	1,3

	A strong team player working with both academic and industrial partners, and strong leadership skills for working with others	1,3
	Strong scientific writing skills	1,3
	Strong real-world problem solving skills in robotics area	1,3

Conditions of Service

The position is full time and fixed term 31 March 2019.

Salary will be on Specialist and Supporting Academic Grade 6, (£29,301 - £38,183 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, 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 Qinggang Meng by email at Q.Meng@lboro.ac.uk or by telephone on +44-(0)1509 635676

Application Closing Date: **16 August 2017**