UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Technician in Computer Vision for Robotics

Faculty of Engineering & Physical Sciences

Salary: Grade 6 (£27,025 – £32,236p.a.)

Reference: ENGME1217

Closing date: 27 August 2019

Fixed-term until 03 January 2021

We will consider flexible working arrangements

Technician in Computer Vision for Robotics
School of Mechanical Engineering

Are you an enthusiastic expert in applied computer vision for robotic systems? Are you looking for a new and exciting challenge as part of a world class robotics team? Do you want to design and create robotic systems that will change our lives?

The University of Leeds has a large portfolio of research in exploration and infrastructure robotics, highlights of which can be seen in the video available at https://youtu.be/vBmfMqTS31U

We are looking for a Technician to make significant contributions to our research activities by helping to develop computer vision systems for use in the control and operation of robotic systems in the air, on the ground and underwater. You will have the opportunity to apply your skills to a wide variety of exciting, cutting-edge robotic research projects including:

- A £4.2M project called "Balancing the impact of City Infrastructure Engineering on Natural systems using Robots" that aims to develop new robot designs and technologies in three areas: "Perch and Repair", "Perceive and Patch" and "Fire and Forget" using world class robot fabrication facilities.
- A £7.2M project that aims to develop swarms of autonomous miniature inspection robots for long-term deployment within live utility pipes.
- Developing our entries to the Mohamed Bin Zayed International Robotics Challenge (MBZIRC), where we aim to compete in all three challenges. Challenge 1 involves a team of UAVs autonomously tracking and interacting with a set of objects (for example intruder UAVs). Challenge 2 involves a team of UAVs and a UGV collaborating to autonomously locate, pick, transport and assemble building blocks to create pre-defined structures in an outdoor environment. Challenge 3 involves a team of robots collaborating to autonomously extinguish a series of simulated fires in an urban high-rise building firefighting scenario.

In this role, you will support the designing and implementing of computer vision systems for practical demonstrators of advanced robotic systems. As well as supporting the wider projects, you will you will conduct advanced work on vision systems for robotics applications, and corresponding autonomous control strategies. You will hold a Bachelors or Masters degree in Computer Science, Artificial Intelligence, Mechatronics and Robotics, or a closely related discipline – or have substantial relevant experience. You will have experience of developing computer vision systems and applying them to physical robotic hardware.

What does the role entail?

- Using initiative, creativity and judgement in applying appropriate computer vision and control approaches to the project (e.g. visual servoing, vision-based mapping and localisation, scene analysis);
- Working with the project collaborators and the National Facility for Innovative Robotic Systems to realise sophisticated practical demonstrators and field trials of autonomous robotic systems;
- Ensure good day-to-day progress towards project deliverables, that project objectives are met and that technical reports are completed on time to the satisfaction of the principal investigator, project leader and sponsor;
- Maintain good records and laboratory notebooks and back up research data according to University and sponsor requirements;
- Contribute to joint discussions with the wider research group, including collaborators, making contacts for future collaboration where appropriate;
- Providing technical support, instruction, practical advice and safety guidance on projects. This will involve advising and assisting academic staff, research staff and students as required on experimental technique and technical issues. This may involve informal one to one training, demonstrations or provision of advice, and can be highly specialised and technical in nature;
- Taking responsibility for general maintenance and security of the laboratory and equipment including maintaining records of consumable levels and equipment, ordering stock to maintain an acceptable level and assisting academics in the purchase and delivery of new equipment;
- Operating in accordance with health and safety procedures, hazard, risk, COSHH assessments and local policies and working with the Faculty Health

and Safety Manager to ensure correct and safe usage of varied laboratory equipment by yourself, undergraduates, postgraduates and members of staff;
- Playing an active role in the technicians' network, for example to share best practice and service improvement ideas.

What will you bring to the role?

- A Bachelors or Masters degree in Computer Science, Artificial Intelligence, Mechatronics and Robotics, or a closely related discipline (or substantial relevant practical experience);
- Experience in the use and development of computer vision systems;
- Ability to use embedded systems software and hardware platforms required for vision processing and interfacing with robots;
- Excellent software skills relevant to computer vision (e.g. OpenCV, ROS, C, C++, Python);
- High level of interpersonal and communication skills, including written and presentational, and the ability to work as a member of a team;
- An enthusiastic approach to research in robotics and autonomous systems;
- Demonstrated ability to work independently, showing initiative and creativity;
- The ability to perform manual handling duties safely using agreed procedures;
- Good time management skills, with the proven ability to meet deadlines.

You may also have:

- Experience in designing and applying autonomous control systems for mobile robotics;
- Experience working with, or developing, physical robot hardware;
- Experience of applying SLAM algorithms and navigation strategies;
- Experience in experimentally testing and evaluating robotic systems;
- Ability to use advanced embedded systems software and hardware platforms such as microcontrollers and FPGAs;
- Experience of using other sensors such as LIDAR and IMUs;
- Proven experience of the ability to interact with PhD students, Masters students and undergraduates in ways that will enhance the student experience in the School;


- Ability to contribute to and develop interdisciplinary collaborative research projects in a broad range of robotics application areas, for example as evidenced by prior experience of working on interdisciplinary projects.

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information page. Applications should be submitted by **23.59** (UK time) on the advertised closing date.

Contact information

To explore the post further or for any queries you may have, please contact:

Professor Robert Richardson, School of Mechanical Engineering, University of Leeds
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Email: r.c.richardson@leeds.ac.uk

Additional information

Faculty and School Information
Further information is available on the research and teaching activities of the School of Mechanical Engineering.

A diverse workforce

The Schools in the Faculty of Engineering & Physical Sciences are proud to have been awarded the Athena SWAN Bronze or Silver Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our equality and inclusion webpage provides more information.

Working at Leeds
Find out more about the benefits of working at the University and what it's like to live and work in the Leeds area on our Working at Leeds information page.

Candidates with disabilities
Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our Accessibility information page or by getting in touch with us at disclosure@leeds.ac.uk.

Criminal record information

Rehabilitation of Offenders Act 1974
A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information page.