CANDIDATE BRIEF

Research Fellow in Control of Surgical Robots,

Faculty of Engineering & Physical Sciences

Salary: Grade 7 (£33,797 – £40,322 p.a.)

Reference: EPSEE1040

Closing date: Saturday 31 July 2021

Fixed-term for 2 years

We will consider job share and flexible working arrangements

Research Fellow in Control of Surgical Robots, School of Electronic and Electrical Engineering.

Do you want to make a difference in patients' quality of life by creating innovative robots that are able to treat incurable diseases? Are you excited about contributing to scientific research in surgical robotics? Are you able to think outside the box to find innovative solutions to life-threatening diseases? Do you want to join a world-leading team of roboticists, manufacturing engineers, and clinicians?

We are looking for a proactive individual to join our Science and Technology Of Robotics in Medicine (STORM) Lab, bringing their excitement for scientific research in surgical robotics with them.

At the STORM Lab, we strive to improve the quality of life for people undergoing soft-tissue surgery and flexible endoscopy by creating miniature and non-invasive robots. This includes the creation and investigation of miniature capsule-like or tentacle robots to work inside the human body. At the STORM Lab, we are designing and creating soft and compliant robotic devices that can be used within the human body to detect and cure diseases in a non-invasive way.

This vacancy is created by a major EPSRC grant (EP/V047914/1 "Terabotics– Terahertz Robotics for Surgery and Medicine") awarded to the University of Leeds, which aims at exploring how Terahertz-based imaging can contribute to the automation of surgical tasks in robotic procedures for early-stage cancer detection and removal. The candidate will join a multi-disciplinary research team aiming at integrating innovative imaging probes into cutting-edge surgical robotic and robotic endoscopy platforms, modelling their behaviour at different steps of the surgical procedure, exploring different levels of computer assistance based on multi-modal sensing, and testing them in realistic anatomical models.

The elements related to the advanced imaging probes will be conducted in collaboration with Professor John Cunningham at the University of Leeds; and Professor Emma MacPherson at the University of Warwick.

Holding a PhD (or close to completion) in Robotics, Mechanical Engineering, Biomedical Engineering, Computer Science, Electronic Engineering or related

disciplines, you will have a proven track-record in medical device design and/or robotic systems, together with a proactive, enthusiastic approach to research.

What does the role entail?

As Research Fellow in Control of Surgical Robots, your main duties will include:

- Developing intelligent algorithms based on multi-modal sensing for autonomous medical robots addressing both abdominal surgery (by using the dVRK) and gastrointestinal endoscopy (by leveraging existing cutting-edge robotic platforms available at the STORM Lab);
- Designing and implementing efficient sensor fusion algorithms for accurate motion estimation;
- Addressing current shortcomings of abdominal robotic surgery working on the dVRK in close collaboration with surgical staff;
- Model, control, test and validate different levels of computer assistance in robotic surgery and robotic endoscopy for early-stage cancer detection and removal;
- Pre-clinical assessment of developed approaches in animal and/or cadaveric models in collaboration with our clinical partners;
- Analysing and summarising research results into high-quality peer-reviewed scientific publications (main target AAAS Science Robotics);
- Co-supervising students in the field of surgical robotics and mechatronics;
- Travelling for research meetings with our collaborators and for presenting research results at conferences worldwide;
- Participating in outreach activities to engage the broader community into science and engineering.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

What will you bring to the role?

As Research Fellow in Control of Surgical Robots you will have:

- A PhD (or close to completion) in one of the following disciplines: Robotics, Mechanical Engineering, Biomedical Engineering, Computer Science, Electronic Engineering, or related disciplines;
- A high level of analytical and computing skills (Python, C/C++, Java, Robot Operating System (ROS), and Mathworks MatLab are preferred);
- Experience and a proven track record in robotic manipulation, motion modelling, motion planning, motion control, inertial sensing, Bayesian filtering, and validating innovative robotic systems, with a track-record of peer-reviewed publications in high-impact-factor journals;
- Experience in supervising students and research interns, with mentoring, leadership and project management skills;
- Experience in presenting the research at international conferences and ability to collaborate with partners at other institutions;
- Experience in flexibility and multitasking through work on multiple stages of system development;
- Considerable experience in interdisciplinary research and integrated development projects;
- A proven ability to work well both individually and as a team;
- A strong commitment to your own continuous professional development.

You may also have:

- Experience of working with the dVRK or other research-grade surgical robotic platforms;
- Experience in artificial intelligence and/or machine learning;
- Experience of collaborating with clinicians;
- Experience of pre-clinical trials in animal or cadaver models.

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information. 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 Pietro Valdastri, PhD, Chair in Robotics and Autonomous Systems
Tel: +44 (0)113 343 3706
Email: P.Valdastri@leeds.ac.uk

Additional information

Faculty and School Information
Further information is available on the research and teaching activities of the Faculty of Engineering & Physical Sciences, and the School of Electronic and Electrical 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 is 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.

Please note: If you are not a British or Irish citizen, from 1 January 2021 you will require permission to work in the UK. This will normally be in the form of a visa but, if you are an EEA/Swiss citizen and resident in the UK before 31 December 2020, this may be your passport or status under the EU Settlement Scheme.

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.