UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Bioinformed Design and Control of Autonomous Robots, Faculty of Engineering

Salary: Grade 7 (£33,199 – £39,609 p.a.)

Reference: ENGCP1100

Fixed-term for 30 months

We will consider flexible working arrangements

Research Fellow in Bioinformed Design and Control of Autonomous Inspection Robots
School of Computing

Are you an enthusiastic and experienced researcher in bioinspired algorithms, computational neuroscience or biorobotic control? Are you looking for a new and exciting challenge as part of a world class biorobotics team? Do you want to design and create robotic systems that will change our lives?

As part of a £7.2M project to build swarms of small inspection robots to live within our city's pipes, you will design, analyse, implement and test control algorithms for small fully autonomous robots for locomotion, navigation and inspection tasks inside active pipes.

You will join a world class team at the University of Leeds with cutting edge expertise across mathematical and simulation models of biological control in animals on the one hand and robotics on the other: developing a broad range of inspection robots including drones and some of the most advanced legged and crawling robots in the world. The Leeds team is responsible for many innovations including biorobotic control algorithms for locomotion in 2013 and navigation algorithms for pothole detection on roads in 2017.

Our research is supported by the EPSRC National Facility of Innovative Robotic Systems, which contains some of the most advanced manufacturing machines in the world. You will join buoyant active research environment alongside six researchers and technicians dedicated to this project alone. Across the broader domain of infrastructure inspection, the University of Leeds leads the EPSRC Grand Challenge in robotic infrastructure inspection and repair – with another 6 academic researchers. Robotics at Leeds has over 100 active members with research in the areas of Field Robotics, Medical Robotics, AI for Robotics and Underpinning Science and Technology.

You will be based in the School of Computing, which is home to a vibrant, multi-disciplinary group with expertise across Applied Computing for Biology (including biological computation and soft-body biomechanics) and AI and Robotics (including robotic planning, manipulation and control). Other research in AI is broadly based,



combining machine learning with computer vision; knowledge representation and reasoning; natural language processing; and robotics.

What does the role entail?

As a Research Fellow your main duties will include:

- Using initiative, creativity and judgement in applying appropriate approaches to the research project, including the conception, implementation and testing of bioinspired algorithms in simulation and hardware.
- Providing significant intellectual input into the development of the research objectives of the collaborative project, preparing papers for publication in leading international journals, and presenting findings at consortium meetings, international conferences and workshops;
- Working with the project collaborators and partners to realise sophisticated practical demonstrators and field trials of robotics;
- Ensuring good day-to-day progress towards project deliverables, ensuring 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 software and research data according to the project, University and sponsor requirements;
- Contribute to joint discussions with the wider research group, including collaborators in Sheffield, Birmingham and Bristol, and making new contacts for future collaboration where appropriate.

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 a Research Fellow you will have:

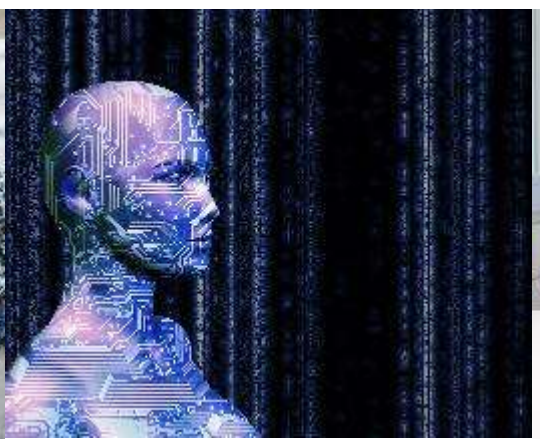
- A PhD (or an expectation that a PhD will be awarded soon) and Bachelors or Masters in a relevant discipline, such as computer science, physics or engineering;
- A track record of significant contributions to original research publications in high quality journals (and conferences);



- Demonstrated ability to work independently, showing scientific maturity, initiative and creativity;
- A deep understanding of the physics and mathematics of some biological system, ideally in the context of sensing and/or control;
- Strong experience in the design, construction and testing of simulation software;
- High level of interpersonal and communication skills, including written and presentational, and the ability to work effectively as a member of a team;
- Good time management skills, with the proven ability to deliver high quality results while meeting deadlines;
- Willingness and ability to travel nationally and internationally to research or project meetings, workshops, conferences, etc;
- A commitment to a positive, inclusive and equal working environment.

You may also have:

- Experience with bespoke simulators (e.g. for robotics, physics, computational neuroscience, etc.);
- Experience in Gazebo and ROS operating system;
- Ability to use basic embedded systems software and hardware platforms;
- Experience of biorobotic approaches to motor control (locomotion, sticking to surfaces, manipulation);
- Experience of biorobotic approaches to navigation, decision making and learning;
- Experience of distributed control for swarm robotics;
- Experience of computer vision or other sensing algorithms/software/testing for autonomous applications;
- 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 and commitment to contribute to and develop interdisciplinary collaborative research projects in a broad range of related application areas, for example as evidenced by prior experience of working on interdisciplinary projects;
- An interest/experience in outreach and public engagement.


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 Netta Cohen, School of Computing
Tel: +44 (0)113 343 2156
Email: n.cohen@leeds.ac.uk

Additional information

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

A diverse workforce
The Faculty of Engineering is proud to have been awarded the Athena Swan 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. We encourage applications from women and underrepresented groups. For more information, please contact Professor Netta Cohen n.cohen@leeds.ac.uk (Athena Swan Champion for the School of Computing).

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.



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.