University of Nottingham
UK | CHINA | MALAYSIA

Role profile

Job title	Research Associate/Fellow in Design and Modelling of Soft and Continuum Robots	Job family and level	Research Level 4 (Appointment will be Level 4 Career training grade where an appointment is made before PhD has been completed)
School/ Department	Faculty of Engineering, Rolls-Royce Manufacturing and On-Wing University Technology Centre (UTC)	Location	Advanced Manufacturing Building at Jubilee Campus

Purpose of the role

The Rolls-Royce Manufacturing and On-Wing University Technology Centre (UTC) at the University of Nottingham is looking to recruit a researcher in the design of robots and mechatronic systems to contribute to existing projects and conduct research within the expanding research groups. This is an exciting opportunity for an experienced graduate/postgraduate to play a leading role in challenging projects. In particular, to coordinate and carry out theoretical and experimental work for developing control methods and architectures for robotised machine tool systems and supervised processes.

	Main responsibilities (Primary accountabilities and responsibilities expected to fulfil the role)	**% time per year**
1	**Research** • Conduct original research to design and control of continuum and soft robots for confined space intervention. • Conduct mechanical design and optimization of continuum and soft robots. This work includes the simulation of the mechanical behavior of the proposed system (e.g., deformation of components) under operating conditions. • Organise and conduct trials to evaluate the performance of prototypes and demonstrators of the proposed continuum and soft robots on representative environments. • Embedment of sensing units into prototypes for in-situ monitoring of the prototype performance during trials. This includes work on the signal processing and analysis of the raw sensor data.	70%
2	**Dissemination of research results** • To write research reports and papers to disseminate research results and develop a track record of published research findings in internationally respected peer-reviewed journals. Further dissemination of results should also occur through invited oral and poster presentations at international meetings, conferences and seminars. • To write reports corresponding to the development of the research work as part of the deliverables of external funded projects.	10%

3	**Support junior members of the group** • Supervise and examine research projects undertaken by undergraduate and master-level students if required.	10%
4	**Engagement** • Participate in the regular meetings of the Rolls-Royce Manufacturing and On-Wing University Technology Centre (UTC). • Facilitate the growth of the UTC through actively seeking funding sources, leading research proposals, and ensuring research excellence. • Contribute to the research work of the UTC and collaborate with their partners as required.	5%
5	**Adhere to H&S regulations** • Operate within the safety systems, IT code of practice etc. as required by the Division, Department and University.	5%

Person specification

	Essential	Desirable
Skills	• Excellent analytical skills for solving kinematic/dynamic/static calculations of complex mechanisms • Excellent skills in writing computer simulations related to robotic control • Skills in developing demonstrators for complex kinematic mechanisms /mechatronics/robotics • Skills in developing monitoring solutions for robotic applications • Highly skilled in programming in MATLAB/Simulink and C/C++applications/ROS • Relevant experience using different API Libraries for control and data analyses • Good general IT skills, including a good working knowledge of word, PowerPoint, Excel, Outlook, etc. • Self-motivated • Ability to work in a team • Excellent communication skills, able to communicate on all levels across many areas. • Presentation/reporting, and publishing skills • Ability to work independently.	• Good understanding of mechanical design of multi-degree of freedom robots • Knowledge in developing mechatronic system • Knowledge of controlling multi-degree of freedom (continuum/soft) robots • Knowledge in sensor systems and electronic interfaces for robots • Knowledge in haptic/vision feedback control Experience of using: • ROS • C/C++/Java/Python • MATLAB/Simulink • LabVIEW modules: FPGA and real time • Visual Studio • Robot Operating System • Windows/Linux/Android operating systems
Knowledge and experience	• Experience in independent development/construction of mechatronics or robotic systems • Experience in developing control solutions for autonomous robots • Experience in developing programs to communicate with electronic devices using USB, RJ45, PCI bus	• Experience in building multi-degree of freedom systems • Experience in modelling of kinematic/dynamic performances of robots • Track record in demonstrating robotic systems

	interface units. • Knowledge of mechanical and mechatronics design, static and dynamic analysis, and intelligent control related to robotics, with evidence of developing own approaches to model such systems	• Experience in developing fast and robust advanced algorithms (i.e. machine learning and statistical analysis)
Qualifications, certification and training (relevant to role)	• Undergraduate or Masters degree in mechanical, mechatronics engineering or robotics • PhD or about to obtain in mechatronics/robotics or related field of mechanical engineering	• PhD in mechatronics/robotics or related field of mechanical engineering

The University strongly endorses Athena SWAN principles, with commitment from all levels of the organisation in furthering women's careers. It is our mission to ensure equal opportunity, best working practices and fair policies for all.

Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University's strategy, vision and values. The following are essential to the role:

Valuing people — Is always equitable and fair and works with integrity. Proactively looks for ways to develop the team and is comfortable providing clarity by explaining the rationale behind decisions.

Taking ownership — Is highly self-aware, looking for ways to improve, both taking on board and offering constructive feedback. Inspires others to take accountability for their own areas.

Forward thinking — Driven to question the status quo and explore new ideas, supporting the team to "lead the way" in terms of know-how and learning.

Professional pride — Sets the bar high with quality systems and control measures in place. Demands high standards of others identifying and addressing any gaps to enhance the overall performance.

Always inclusive — Ensures accessibility to the wider community, actively encouraging inclusion and seeking to involve others. Ensures others always consider the wider context when sharing information making full use of networks and connections.

Key relationships with others

Line manager

Role holder

Key stakeholder relationships