Purpose of role

The Rolls-Royce Manufacturing and On-Wing University Technology Centre (UTC) at the University of Nottingham is looking to recruit a researcher in Robotic/Mechatronics systems design and control 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. To coordinate and carry out theoretical and experimental work for developing control methods and architectures for Robotic/Mechatronics systems and supervised processes.

Main responsibilities

(Primary accountabilities and responsibilities expected to fulfil the role)

| % time per year |  
|-----------------|---
| Research        | 70%

1. To conduct theoretical models and control algorithms and implement them in real time applications for Robotic/Mechatronics systems.
2. To develop control concepts of Robotic/Mechatronics systems along with appropriate supervision/monitoring systems.
3. Demonstrate Robotic/Mechatronics systems solutions and test them in "simulated" working environments using different software platforms.
4. To design hardware and software architectures for high/low level control modules of Robotic/Mechatronics systems.

Dissemination of research results

1. 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.
2. To write reports corresponding to the development of the research work as part of the deliverables of external funded projects.
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<th><strong>Support junior members of the group</strong></th>
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<td>• Supervise and examine research projects undertaken by undergraduate and master level students if required.</td>
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<th><strong>Engagement</strong></th>
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<td>• Participate in the regular meetings of the Machining and Condition Monitoring Group (MCM) and Rolls-Royce Manufacturing and On-Wing University Technology Centre (UTC).</td>
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<td>• Facilitate the growth of both the MCM group and UTC through actively seeking funding sources, leading research proposals, and ensuring research excellence.</td>
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<td>• Contribute to the research work of the Machining and Condition Monitoring Group and collaborate with their partners as required.</td>
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<th><strong>Adhere to H&amp;S regulations</strong></th>
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<td>• Operate within the safety systems, IT code of practice etc. as required by the Division, Department and University.</td>
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<td>Person specification</td>
<td>Essential</td>
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| **Skills** | • Excellent analytical skills for solving kinematic/dynamic/static calculations of complex mechanisms  
• Excellent skills in writing computer simulations related to Robotic/Mechatronics systems.  
• Skills in developing demonstrators for complex kinematic mechanisms /mechatronics/robotics  
• Skills in developing monitoring solutions for Robotic/Mechatronics applications | • Good understanding of kinematics/dynamics of multi-degree of freedom robotics  
• Knowledge of controlling multi-degree of freedom robots  
• Knowledge in developing collision avoidance and/or workspace recognition  
• Knowledge in sensor systems and electronic interfaces for robots  
• Knowledge in haptic/vision feedback control |
| **IT Skills** | • Highly skilled in programming in MATLAB/Simulink and C/C++ applications/ROS or LabVIEW  
• 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. | • Experience of using:  
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 interface units.  
• Good knowledge of kinematic, static and dynamic analysis, control solutions related to Robotics/Mechatronics | • Experience in building multi-degree of freedom systems  
• Experience in modelling of kinematic/dynamic performances of robots  
• Track record in demonstrating robotic systems  
• Experience in developing fast and robust advanced algorithms (i.e. machine learning and statistical analysis)  
• Previous expertise in developing customized Robotics/Mechatronics (e.g. for manipulation/surveillance) |
| **Qualifications, certification and training (relevant to role)** | • Undergraduate or Masters degree in mechanical, mechatronics engineering or robotics  
• Good first degree in Robotics/Mechatronics/Control/Mechanical Engineering or related disciplines  
• PhD (or about to obtain) in robotics/mechatronics or related field of mechanical engineering | • PhD in robotics/mechatronics engineering or related field of mechanical engineering |
| **Other** | • Self-motivated  
• Capable to lead the research work on this project | • Willing to collaborate on spin-out individual projects |
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.

- Ability to work in a team
- Excellent communication skills, able to communicate on all levels across many areas.
- Ability to work independently.
- Presentation/reporting and publishing skills
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
      - Colleagues
      - Students
  - Prof Dragos Axinte
    - Research Associate /Fellow