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THE NATIONAL ROBOTARIUM

PEOPLE CENTRED :: INTELLIGENCE DRIVEN

SPOTLIGHT ON :: ROBOT TRAIN CLEANERS



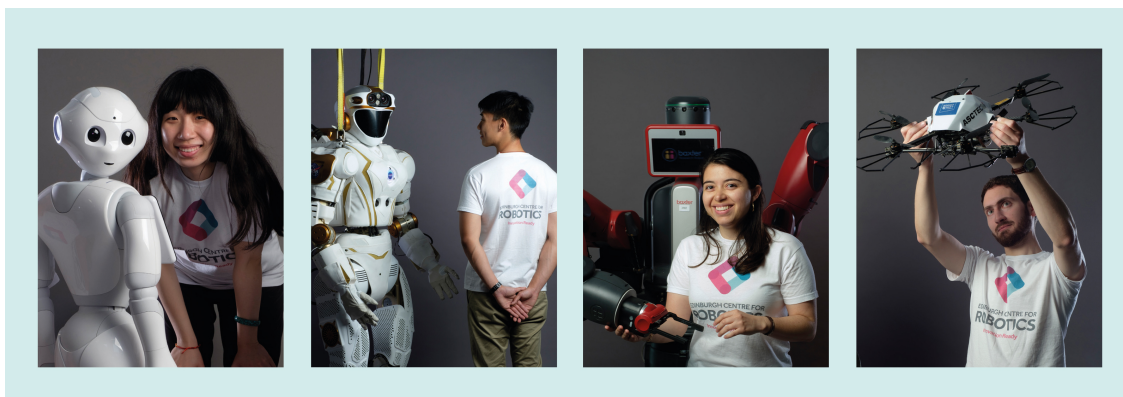
Scientists at the National Robotarium are developing a new train cleaning robot that can support staff to maintain carriage cleanliness while reducing health risks.

The robot, which is being funded by rail research body RSSB, has been designed to complement humans by cleaning in the hard-to-reach places between and under the seats. Repeatedly reaching underneath seats throughout a long shift can lead to health problems, an issue the robot is designed to tackle. While it sets about removing waste in the nooks and crannies, existing cleaners can focus on other tasks such as disinfecting surfaces.

Researchers worked closely with presentation staff at London Liverpool

rubbish

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EPSRC Centre for Doctoral Training in Robotics and Autonomous Systems :: PhD Programme

Applications are open to complete a PhD at the EPSRC Centre for Doctoral Training in RAS!

14 fully-funded places are available for students with an interest in robotics to kick off a PhD in September 2022. Whether your background is in STEM, social sciences or the creative disciplines, we are open to applications that can show us why you want to pursue a research project in robotics and how your research proposal fits into this year's project themes.

We are committed to facilitating a shift in the diversity of the robotics research community through proactive practices to support equality, diversity and inclusion at all levels and encourage applications from all backgrounds. Our work in this area was recently recognised by Informatics Europe, who awarded the CDT with the Minerva Informatics Equality Award.

Benefits of the programme include access to MSc-level courses, non-technical skills training, funding available for commercialisation as well as access to the world-class research facilities of the National Robotarium.

Sound perfect? Closing date for applications is 28th January 2022 - find out how to apply [here](#).

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NEWS ROUND UP



We rounded off 2021 with an extra special industry partnership - teaming up with Santa and the elves! Working with robotics software company Cyberselves, National Robotarium roboticists explored how robotics tech could help save Santa from getting stuck up any chimneys on Christmas Eve.

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Robots offer incredible opportunities to make hazardous work safer. Exploring one such example, co-academic lead of the National Robotarium, Dr Adam Stokes, spoke to Robotics & Innovation magazine about the Connect-R project and the future role of robotics in nuclear power

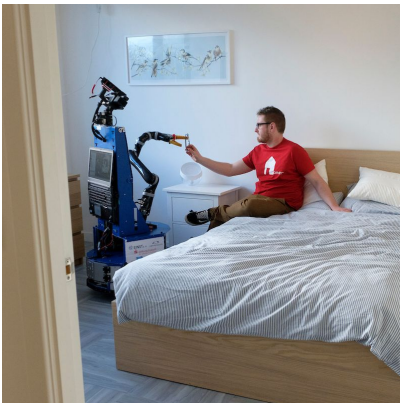
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sector, we've partnered with Scotland's national respite centre, Leuchie House, to work with residents and their carers to develop new assisted living technologies that will support greater independence.

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How will robotics complement workplaces in years to come? Professor Yvan Petillot, co-academic lead of the National Robotarium and director of the ORCA Hub, explained all to Automate Pro Europe, from cobots to skills development.

[READ THE ARTICLE ON PAGE 20](#)

Head of Innovation at Blackwood Homes & Care, Colin Foskett spoke to AT Today about their collaborative work with the CARE Group, led by Dr Mauro Dragone. Through the **OpenAAL project,** researchers are testing assisted living solutions in a real-world setting.

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What does a self-driving car do when it's foggy? A group led by Dr Sen Wang and Professor Andrew Wallace has developed a radar-based Simultaneous Localization and Mapping (SLAM) system to allow self-driving vehicles to navigate in all weather conditions, including hail, rain or snow. The work has been accepted for publication in the International Journal of Robotics Research (IJRR).

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**Martin Ross,
PhD student in computer science**

What does your research entail?

My research project is investigating how and to what extent an adaptive robotic coach can be used to aid the process of long-term rehabilitation after stroke and adherence to repetitive solo practices in squash. So far I have run a study using the Pepper robot in which it coached participants through 15-minute solo practice sessions.

Next, we will be investigating if a very similar system can be used to coach users through individual rehabilitation sessions. If this is successful, the final stage of the project will be to investigate the long-term effects of such a system on the motivation and adherence of both groups of people to their respective individual exercise routines, when the system adapts its behaviours to individual users.

How do you expect your research will impact society?

I hope that the work I do in my PhD can have a real impact on the lives of people recovering from a stroke by motivating them to adhere to an at-home exercise routine. Likewise, I hope that this project can contribute to the growing body of research concerning technology in sports. Not only this, but the methods used to develop the robotic coaching system could be replicated in other domains to produce systems capable of motivating people in different scenarios.

What's the biggest challenge you face in your research?

Other than the obvious challenges that COVID has thrown up (e.g. not having access to the lab, being unable to run in-person experiments for an extended period of time), one of the biggest challenges has been integrating different technologies to implement a working system. For example, the robotic squash coach uses a racket-mounted sensor to gather data on a player's swing which is then processed by our algorithms to give appropriate feedback through the Pepper robot.

How did you become interested in robotics?

that's what I wanted to do. Here I am, 9 years later, and it has become a reality for me!

Bitesize

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Do you know a budding young roboticist with oodles of creativity? Make sure they enter the UK-RAS Network's schools competition!



The **Once Upon A Robot** and **Draw A Robot** competitions are open to primary school pupils.

Creative kids can get involved by writing a robot story or drawing their very own robot design, imagining how robots could help humans in future. Roboticists from **The National Robotarium** and the **Orca Hub** will be amongst the judges reviewing the stories and pictures submitted. The experts will be on the lookout for entries that capture the imagination by showing how robotics tech could help our world. Truly robotic prizes are up for grabs, including a tour of the National Robotarium!

Thinking caps at the ready?

Check out the two competitions and **READ MORE**

YOUR CHANCE TO GET INVOLVED

Early bird registration is open for the 5th IEEE-RAS International Conference on Soft Robotics!

Sponsored by the National Robotarium and Meta Reality Labs, the conference is taking place in Edinburgh from 4th-8th April 2022. This year's theme, "Soft Robots for the Planet", will see contributors present the most recent progress in soft robotics and discuss opportunities for "green" soft robots that could help protect the planet.

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SPREADING THE WORD

If your organisation or school would like to get involved in the work of the National Robotarium, whether to tackle an industry problem or engage young people in robotics research, we'd love to help!

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