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THE NATIONAL
ROBOTARIUM
PEOPLE CENTRED :: INTELLIGENCE DRIVEN

SPOTLIGHT ON :: Improving robotic cancer surgeries



Researchers from the National Robotarium, industry partners and Edinburgh-based clinicians are creating a new robot-assisted surgery technique to improve cancer surgical outcomes and patient care.

Led by Dr Yuhang Chen, the ground-breaking method has been awarded £1.25 million from the Engineering and Physical Sciences Research Council (EPSRC), part of UK Research and Innovation.

It will be used during robotic surgery to help decide how much of the patient's tissue is affected by cancer and should be removed. The new method will provide surgeons with real-time feedback, allowing for greater precision when differentiating normal from abnormal tissue.

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Rt. Hon. Michael Gove MP visits National Robotarium

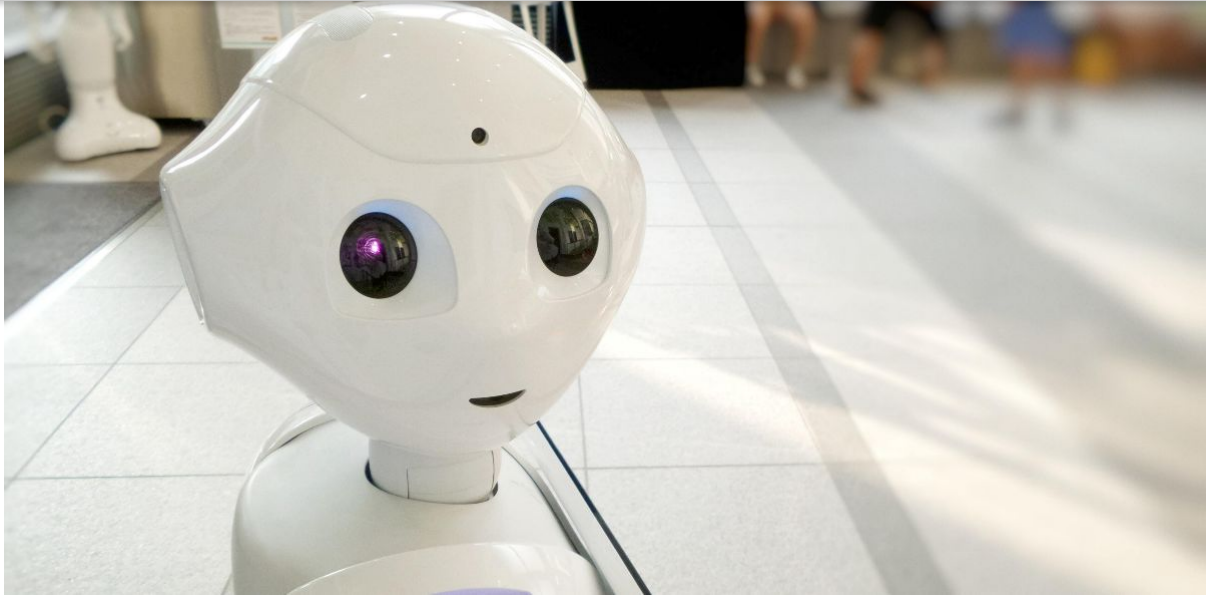


Secretary of State for Levelling Up **Michael Gove MP** visited the National Robotarium on 24 February for a tour of the state-of-the-art research facility.

During his visit, Mr Gove saw some of the innovative research projects being developed, including our resident **robot dogs M.A.R.T.I.N and M.A.R.T.I.N.A.** In attendance were Heriot-Watt University Vice-Principal, Professor Mark Biggs, University of Edinburgh Principal, Professor Peter Mathieson, and National Robotarium CEO, Stewart Miller who discussed with the Minister how our collaborative ethos and strong partnerships can be an exemplar for delivering real-world solutions and improving lives.

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Global Amazon AI Competition

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A postgraduate student team from the National Robotarium, supported by Heriot-Watt University and the University of Edinburgh, has been selected to compete in Amazon's new global AI competition. The eight-strong team, led by Professor Verena Reiser with new National Robotarium academic Alessandro Suglia, will create an embodied agent to help people around the home, similar to a robot butler.

Amazon's Alexa Prize SimBot Challenge asks teams to create help for a futuristic world that can understand natural language, interact with humans and accomplish tasks and missions.

The National Robotarium team is the only non-US group to pass the initial selection process, demonstrating its world-leading expertise in embodied conversational AI research and teaching.

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NEWS ROUNDUP



National Robotarium and OXLABS to benefit from The Scottish Inward Investment Catalyst fund.

The fund, launched by Interface and the Scottish Government, strengthening ties between overseas businesses and Scottish universities. OXLABS and the National

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Open Ambient Assisted Living Lab (OpenAAL).

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National Robotarium academics contribute world-leading expertise to help tackle racial inequalities.

The PRIME project will identify the distinctive online harms that minority ethnic communities experience because of the rapid digitalisation of public services. Professor Lynne Baillie, a key figure in the National Robotarium, will lead on the design and development of privacy enhancing technologies and AI that will focus on countering discriminatory processes in digitalised services.

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Italian Ambassador visits Heriot-Watt University and tours robotic research labs.

In addition to speaking with University Principal and Vice-Chancellor, Professor Richard A. Williams, Ambassador Raffaele Trombetta and his delegation were interested in learning more about how the National Robotarium is using robotics and AI to advance research and develop the use of autonomous systems and support within health, social care and other sectors.

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How can healthcare facilities benefit from academic collaboration? In this article, Colin Foskett of Blackwood Homes & Care reveals how his team’s partnership with the National Robotarium will improve independent living and drive improvements in health and care services.

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Women working and studying in the fields of Robotics and AI celebrated on International Women and Girls in Science Day. On 11 February, we joined-up with this global awareness campaign to showcase some of the remarkable women in Robotics and AI who are inspiring the next generation of female scientists.

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Without trust at the centre of robotics research, adoption will face numerous barriers. Writing in



The University of Edinburgh hosted the 5th IEEE UK & Ireland RAS Conference on 23 Feb. Over 80 delegates were in attendance at the

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academic lead Professor Yvan Petillot urges industry and academic partners around the world to share best practice about how to engage the public in robotics and AI research and innovation.

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The Alan Turing Institute and the Edinburgh Centre for Robotics. The seminar theme was 'RAS: Disruptive Technologies for the New Normal' and focused on how RAS can help address global challenges.

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THE UNIVERSITY of EDINBURGH



Q&A

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Talal Shaikh, Associate Professor, Heriot-Watt University Dubai Campus

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Why is it important to showcase the work of the National Robotarium on a global stage like Expo2020 in Dubai?

Globally, Expo 2020 Dubai provides a showcase of what countries have to offer. Expo 2020 Dubai is the ideal place to showcase all that can be done to contribute to a better world in the future. We are perfectly suited to the theme, Connecting Minds and Creating the Future, of Expo 2020.

What does your work involve?

Currently, I teach courses in Artificial Intelligence and Intelligent Robotics at Heriot Watt University's Dubai campus's School of Mathematical and Computer Sciences. In addition to teaching, I work with students on different research projects that range from Food Computers, Contactless Smart Home systems to Robotic Navigation in airports.

After switching to the academic world from the corporate world, I've been able to help the students bridge the gap between what's taught in a classroom-setting versus what's done in the actual workplace. As a teacher, it is my goal to promote deeper understanding and stimulate interest in the subject.

In my role as a researcher, I currently focus on the health domain where I work on contactless sensing of vital signs to better support people in smart home

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security. Digitally understanding human emotions is also crucial for smart spaces and human-robot interaction research.

Why do you think the National Robotarium is globally significant?

The Robotarium is developing innovative solutions to global challenges by being a leader in the field of robotics and artificial intelligence. By taking research from the lab to the marketplace, the facility contributes substantially to society.

What message do you want to share at Expo about your work?

Since a young age, I have been intrigued by how machines talk with each other. This led me to make things like machines, devices, robots, software etc. talk with each other and thereby achieve a common goal. The impact of this is much more amplified if the task is to solve some human-related goal. For that to happen it has to be solved through machine understanding of various human nuances that make up interactions.

There is research that was funded by Expo Live 2020 team to look into Human Lip reading from videos to help hard of hearing people interact with people in noisy environments. This was implemented as an intelligent kiosk and the information was generated from fusing the audio and lip movement to generate the corresponding text. Projects like this will help in better understanding human interactions and will make it easier for people inhabiting smart environments. Currently, my focus is to detect in a non-intrusive way to detect the vital signs of people using ubiquitous available devices like wireless routers at home using Wifi waves.

In the past, I have run events for school children to interact with robots like Romo, Lego Mindstorm, and Cozmo using social media platforms like Twitter. I used the robots in many different ways like races, wrestling etc, and I was thrilled to see how such events impacted the children's perception of human robot interaction.

EVENTS AND OPPORTUNITIES

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Digital Humans: What Technology reveals about the our cognition, emotions and behaviour. Join Professor Thusha Rajendran on Wed 30 March, when he delivers the Heriot-Watt University Bicentennial Inaugural Lecture, live and in-person at Edinburgh campus. In his talk, Professor Rajendran will look through his research career at what technologies – from text chat to touchscreens, virtual environments and robots – can reveal about ourselves and what kind of society we want.

Register via Eventbrite.



Register for the 5th IEEE-RAS International Conference on Soft Robotics! This year's theme is "Soft Robots for the Planet" – with speakers exploring how the latest innovations in soft robotics could help solve some of our greatest environmental challenges, improve healthcare and increase quality of life.

The conference will take place in Edinburgh from 4-8 April and is sponsored by the National Robotarium.

Register now to hear how soft robotics can go green.

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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