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SPOTLIGHT ON :: MINISTERIAL VISIT TO THE NATIONAL ROBOTARIUM

MP Iain Stewart meets 'Spot' robot

The National Robotarium welcomed a visit from UK Government Minister Iain Stewart this month. The minister visited the building site and human-robot interaction lab as well as being introduced to the Spot robot. The research team at the Assisted Living Lab took the opportunity to showcase pioneering intelligent sensing and tele-presence robotic technology, which will allow health practitioners to remotely assess a person's physical and cognitive health from anywhere in the world.

Researchers at the Assisted Living Lab have developed a prototype that makes use of machine learning and artificial intelligence techniques to

non-intrusive assessment of an older person's cognitive abilities, as well as their ability to live independently.

By combining this system with a tele-presence robot, the technology demonstrates two major advances. Robots can be equipped with powerful sensors and operate in a semi-autonomous mode, enriching the capability of the system to deliver quality data. Furthermore, tele-presence robots keep clinicians and carers in the loop with data provided by the project's intelligent sensing system, and they can also control the robot directly, over the Internet, to interact with the individual under their care.

The research is being led by Dr Mauro Dragone and supported by three National Robotarium students - Scott MacLeod, Ronnie Smith and Rakin Sarder.

The doctor will see you now - by teleporting into your home!

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NEWS ROUND UP

Stewart Miller, CEO of the National Robotarium, with underwater robot

Stewart Miller appointed National Robotarium CEO

This milestone moment for the centre earned words of congratulations from the Scottish and UK Governments. Stewart is a distinguished business leader with a wealth of experience in technology development in the aerospace sector. As CEO, his ambition is to build the National Robotarium into a globally recognised centre of excellence for AI and robotics, working directly with business to accelerate innovation and drive value from world-class research, create talent of the future through a flexible skills programme and support entrepreneurs capable of creating exciting new businesses to fuel our economy.

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trip to Edinburgh. The robotic coaching project, delivered in collaboration with industry partner RacketWare, will explore how robotics can improve player performance and motivation.

WATCH THE EPISODE

How do you talk to your AI assistant? Head of ethics at the National Robotarium, **Professor Verena Rieser**, and CDT PhD student **Amanda Curry** spoke to the New Statesman to explain the risks inherent in ignoring verbal abuse of AI assistants. Research is examining concerns that abusive interactions with AIs, if normalised online, could spill over into the physical world.

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UKRI Hub on Trustworthy Systems hosted an All Hands Meeting to discuss research and strategy for the next year. The Nodes, led by National Robotarium academics **Professor Subramanian Ramamoorthy** (Node on Governance and Regulation) and **Professor Helen Hastie** (Node on Trust), contributed to panel discussions and organised workshops open to all on Natural Language Interaction; Subjective Measures and Questionnaires for Trust; and Specifying for Trustworthiness.

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Dr Patricia A. Vargas and **Professor Ruth Aylett** have published *Living with Robots: What Every Anxious Human Needs to Know* with the **MIT Press.** The new book, with a foreword by **Professor Noel Sharkey**, is a lively guide explaining what robots can and can't do, offering an accessible insight into robotics.

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Dr Mustafa Suphi Erden, Dr Xiaoran Han and **Dr Ibrahim Küçükdemiral** published *'Time delay control with sliding mode observer for a class of nonlinear systems: Performance and stability' in the* **International Journal of Robust and Nonlinear Control.** The research was part of the **ROBMAN** project, supported by the **EPSRC ORCA Partnership Resource Fund**.

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Informatics & Computer Science Alliance (SICSA) Conference during the CDT Showcase Session. Professor Hastie joined a panel discussion on PhD training across SICSA partners in Scotland, with a view to forge further collaborations and cross-CDT activities. CDT-RAS student Paola Ardón Ramírez and alumnus Ross McKenzie, now working for Dyniam, joined to talk about their experience working towards their PhD at the CDT-RAS.

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Professor Verena Rieser was named as one of the UK's 50 trailblazing women in tech in the Inspiring Fifty UK awards, hosted by accelerateHER. With over 500 entries this year, the list spotlights women spearheading transformation in the tech industry. Professor Rieser was recognised for her world-leading research into ethics and conversational AI.

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CENTRE FOR DOCTORAL TRAINING :: Student Spotlight

Scott MacLeod
PhD student: Pervasive sensing, telepresence, and robotic technologies for cognitive assessment

What does your research entail?
My research focuses on the use of pervasive sensing, telepresence and robotic technology, to facilitate remote assessment and automate continuous cognitive assessment of people with mild cognitive impairment and those who are at risk of developing dementia. The goal is to enable the provision of assistance that is always in tune with care needs.

How do you expect your research will impact society?

assessments for those that need them. With a variable condition such as cognitive impairment, this can lead to insufficient or incorrect care plans. People experiencing cognitive impairment need to utilise their total cognitive function in order to preserve their cognition. Studies have shown that when people with dementia are moved into care and no longer perform tasks themselves around the home, their cognitive function degrades very quickly.

Researchers in the field of assistive technology are exploring ways for clinicians to monitor their patients' condition continuously over time, without time-intensive periodic pen and paper assessments. Whether this is achieved with technologies such as remote tele-assessment or automated assessment, it will allow for more accurate care plans and cognitive training. This will help increase the quality of life and combat the progression of cognitive impairment.

What's the biggest challenge you face in your research?
'Activities of daily living' (ADLs) performed in the home, such as cleaning or cooking, can be completed in numerous ways. In order to conduct a cognitive assessment of a person based on ADLs you need to understand precisely what they do. You need to know their exact actions, the order in which they happen and any errors they make, all while adapting to the myriad ways a person can possibly complete the ADL.

Therefore, my challenge is to model how they are likely to complete the ADL, by modelling the person's cognitive state. This can then be combined with sensor data to complete precise activity recognition, which enables cognitive assessment and assistance. The result is then used to further improve the model.

How did you become interested in robotics?
While working on my undergraduate degree, I had the opportunity to work with underwater robots. Not having worked with robots before I was excited that we could explore the seabed remotely. Seeing the application of robotics in a home and care home environment while finishing my degree, I became very interested in the potential of this technology, and so chose to pursue research in this area.

What do you hope to achieve through your robotics research?
I hope to encourage research and development of assistive technology that takes into account the specifics of users' cognitive state. This will better enable the technology to know what help to provide, when to help and when to just observe as the person completes an activity. I believe this will increase the effectiveness and decrease the resistance of people to the technology.

the coming years?

With my area of research in mind, most likely the biggest challenge is the ageing population. Virtually every country in the world is experiencing growth in the number and proportion of older people in their population. This means there are more people who need care than ever before, but fewer people to deliver it. I believe that technology, and robotics in particular, will play a key part in planning for this challenge.

A young visitor interacts with a Heriot-Watt robot

Bitesize

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This month, we celebrated 6 months since construction began on the new National Robotarium building! New facilities will include laser labs, a living lab to test out AI and robotics solutions for assisted living and an education hub to host open days and other events to engage young people in robotics research.

If you know a young person interested in robots, get them to read about our new building and careers in robotics on CBBC Newsround!

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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!

CONTACT US

SPREADING THE WORD

We have started posting on our social channels. If you are able to support our engagement and grow our following, please visit @NRobotarium on Twitter or @The National Robotarium on LinkedIn and tag us in relevant news and content.