Assisted living lab announces successful event at Heriot-Watt

The National Robotarium at Heriot-Watt University brought inventors together in a week-long event showing how robotics can help with social care offering an opportunity to prototype new solutions. The eventuated the world's first open and remote access assisted living lab at the virtual event.

One of the inventions is a single -in-ear switch which connects multiple home appliances, but other ideas will support existing care packages and support social isolation. Earswitch can operate several devices using only an ear muscle which could improve independence for those in assisted living settings.

The 'Earswitch' was created by primary care practitioner, Dr Nick Gompertz, from Somerset and is supported by funding from NIHR. Dr Gompertz previously proved voluntary movements of the eardrum could be filmed and then used to trigger a virtual keyboard for MND and complex stroke sufferers.

Dr Gompertz worked with Thomas Gillett, a PhD student at Heriot-Watt University, to improve the accuracy of the switch

and to connect it to existing assistive devices and automation frameworks. This simplifies the use of the Earswitch with a diverse range of assistive devices, including emerging examples of assistive robotic technology.

Explaining his involvement in the event, Dr Gompertz, inventor of the Earswitch, said: “The Mashup has helped to accelerate and widen the applications of the Earswitch prototype. During the event, we’ve used the Earswitch to control disability software which then can connect to devices throughout the National Robotarium’s assisted living lab and beyond. This allows a user to control multiple appliances in a home setting with their ear muscle alone.

“Everyone with assisted living needs faces a unique set of challenges so they can end up with multiple devices to support their needs. The updated Earswitch prototype can now control a single access point from which to surf the internet, control wheelchairs, operate home appliances and even play computer games.”

Team Communicare, led by Dr. Mel McKendrick, assistant professor, School of Social Science, Psychology, at Heriot-

Watt University, was declared the event's winner with their concept for technology-aided social cognition and human interaction.

Dr. McKendrick said: "Social isolation is associated with poor mental health and is a significant concern in an older population, whether in their own homes, residential homes or hospitals. It is also applicable to single parent families, individuals with mental health challenges, offenders, homeless people and linguistically and culturally diverse individuals including migrants and refugees. However, recipients of existing befriending services report varying experiences with challenges in the relationship between befriender and befriending recipients in social perception. This may impact on the success of the befriending.

"Our Hermes Holistic Messenger is designed to augment virtual communication tools used in befriending applications. By enhancing social cognition through increasing the befriender's awareness of the cultural and mental individual differences of the befriending recipient, the experience and continued social support may yield significant reductions in feelings of social isolation and associated negative impacts".

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Fourteen international speakers led those taking part through talks offering different perspectives on the problem of delivering care in this way, including examination of ethics and the Internet of Things (IoT).

Dr Mauro Dragone, an assistant professor and director of the Robotic Assisted Living Testbed (RALT) at the National Robotarium, based at Heriot-Watt University, co-organised the event. He explained: “The National Robotarium’s mission is to translate cutting-edge research into technologies to create disruptive innovation in an expanding global market, delivering sustainable economic benefit to Edinburgh, the UK and beyond.

“Our Robotics and Care Mashup exemplifies the concept of a user-centred living lab, integrating concurrent research and innovation processes within a public-private-people partnership. We involved a range of stakeholders in the event to define research priorities and questions for health and social care technology and to accelerate innovation in the sector.

“Our assisted living lab is set up to operate like a real flat with a kitchen, living room, bathroom and bedroom. Throughout the home, we have connected sensors, domestic robots and other assisted living technology to help care practitioners, designers and end users to test the usefulness of assisted living technologies. Through our Open Ambient Assisted Living (OpenAAL) project, we have recently equipped our laboratory to offer real-time interaction with its sensing, automation and robotic equipment, over the Internet.

“This provides a platform that researchers, technology and industry users can use to co-create technology, where time and distance is no longer a barrier – any time, any place access. The aim is to catalyze and support collaborations to more quickly develop innovative concepts of assistive living technology to be considered for mass-market roll-out and rapid uptake.”

Graham Watson, executive chairman of SHIL, said: “Now more than ever, innovation that accelerates improvements in patient care is a vital focus. Scotland and the rest of the UK has an

incredible wealth of expertise and these ground-breaking events provide an opportunity to foster collaboration across the healthcare innovation ecosystem and solve real problems in the care sector. We look forward to driving forward more exciting innovations with the teams involved.”

The Earswitch team also worked with Nick Laing from smart home company, Function Control to operate real home functions including lighting, heating and motorised blinds during the live event, and with assistive tech companies Smartbox and GetTecla. As well as controlling simple switching commands, the team now intends to combine biometric data from the Earswitch with smart home monitoring data to build a picture of a person’s overall health, daily routines and activities in the home.