

# New Anchor Robotics facility opens to develop robots that help elderly to live independently

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Bristol Robotics Laboratory (BRL) is launching its latest project – the Anchor Robotics Personalised Assisted Living (ARPAL) facility - that will enable robotics researchers, elderly people with assistive needs and those supporting them, to work together to devise and test new robotic solutions in a home environment.

The work that takes place in the facility will focus on enabling [elderly people](#) to live safe and independent lives in their own homes for as long as possible with the assistance of personally adaptive robotic systems.

The facility launch takes place at the BRL which is based at the University of the West of England (UWE Bristol) Frenchay Campus on Wednesday 9 September.

The ARPAL facility is sponsored by The Anchor Society, a charity that supports the elderly, frail and isolated in Bristol and the neighbouring regions, who want to see more people ageing actively in their own homes.

The new ARPAL facility will provide a 'Living Lab' environment. The 'Living Lab' concept refers to a set of methodologies and tools for the co-creation and validation of innovation together with the end-users in real-world environments. Having been designed to resemble a typical single level home comprising an open-plan living, dining and kitchen area and a

bathroom and bedroom, the facility will enable researchers to carry out experiments of innovative robotic technology in a lifelike environment. This will help develop pragmatic solutions and reduce time to market.

The facility has been instrumented with a network of wireless sensors linked to a Smart Home Controller Hub, Wi-Fi cameras and an ADSL connection. The UWE Bristol team at BRL are using the data generated from the sensors to detect patterns of activity in the house to build adaptable algorithms. The algorithms will be used to record individual habits to devise personalised robotic systems especially adapted to each person's lifestyle to support independent living.

Theme leader for Assisted Living in the BRL and Head of Electronics and Computer Systems at Designability, Dr Praminda Caleb-Solly, is developing the new setting to enable teamwork with elderly people, carers, families, clinicians and residential care providers who will play a critical role in the future development of novel robots so that they are useful and responsive to the needs of the people they are designed to help.

Dr Caleb-Solly said, "Participatory design with the people and organisations who will be using the technology is critical to the way we are developing robots to support older adults in the future.

"All of our work is centred on a deep understanding of the needs of people so that we shape the technology to respond appropriately. The facility has been constructed to standardised specifications so that robots and smart integrated devices can be rigorously tested and validated for safety and evaluated in conjunction with end users to ensure that they have a high level of utility and usability."

Bob Durie, Chair of the Anchor Society said, "The Anchor Society sees the support of robotics to be part of our role to produce innovative

solutions for helping our beneficiaries to enable them to live more fruitful lives and to reduce isolation in the elderly. We live in a fast changing world and our generous donors expect our charity to deliver support for those we can help by harnessing new technology and expertise".

Dr Caleb-Solly describes a current experiment; she said, "We are using the sensor data to build algorithms that learn the habits of an elderly person so that robots can offer timely and personalised assistance if, for example, someone forgets to eat, drink or take medicines. Sensors have been fitted to furniture, doors, medicine bottles, fridges, plugs and kettles.

"The sensors send information to a smart home controller hub, developed by ContinuumBridge, who started working with BRL researchers as part of a joint Innovate UK Internet of Sensors project. The sensor data is then sent to a Cloud server and also processed locally, enabling a robot to react if something untoward happens. For example some medicines should only be taken after eating and if the algorithms analysing the sensor information from the fridge, cooker, cupboard and kettle sensors, deem that there is a high probability that the person hasn't had anything to eat for a while, then when the person opens the medicine drawer, a robot is then mobilised to remind the person to eat first before taking the medicine. This active reminder from a robot can be more interactive and engaging than, say a text message on a phone, which might even be in another room.

"We have also fitted the home with a telepresence robot that enables remote monitoring. If an alert is sent because there is no activity in the house during a certain time period, when habitual recorded algorithms would indicate a person would normally be up and about, an alert might be sent to the carer remotely who can try and contact the person via the usual channels, for example phone or text message. If there is no

response from the person then the carer could activate the telepresence robot and see if there is a problem.

"If the person has had a fall or a heart attack for example appropriate emergency assistance can be deployed immediately and if they are able to, they can be reassured by the carer remotely while help arrives. This technology could avoid expensive triggering of emergency services when they are not needed but also ensures that they are deployed faster if necessary."

Professor Chris Melhuish, Director of the BRL said, "The Anchor Robotics facility is the latest innovation at the world leading Bristol Robotics Laboratory which is an outward looking research hub focused on building connections with businesses and organisations to develop real life solutions so that the technology of the future matches the needs of society through research and through business technology incubation projects."

Provided by University of Bristol

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