

Switched-on seniors

Involving end-users in the design of new technology has worked wonders for older Australians

A new check-in system for elderly people, designed with their emotional needs in mind, has proved successful in early trials.

Director of Swinburne's Future Self and Design Living Lab, Associate Professor Sonja Pedell, is part of a global movement of designers that believes end-users should be partners in the search for solutions to their problems.

Pedell, along with Emeritus Professor Leon Sterling and other members of the Centre for Design Innovation, turned their attention to emergency alarms for vulnerable Australians, such as the elderly; a research project supported by the Smart Internet Cooperative Research Centre and the Australian Research Council.

They found that older people felt home-based emergency alarms and wellbeing check systems were like "cowbells" forced on them. In response, the

research team developed an iPad-based, picture-frame system that allows older people to receive photographs and messages from loved-ones each day.

When the participants responded to these messages, community service providers and carers would be assured that they were OK.

The prototype was embraced by carers such as 'Joe', who felt it helped in sharing the care of an aged relative: "You can build a network of support," Joe said. "It shares the exposure and the responsibility."

Pedell said elderly users were also more engaged with the iPad system because it increased their contact with family and friends. "From an emotional point of view, people were feeling not only cared for, but also cared about, and that is a critical difference," she said.

Pedell said while technology had the potential to improve the



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lives of the elderly, it often fell short because it did not address their emotional requirements.

She aimed to overcome that through an "emotion-led approach [to design] where we ask the end-users, 'how would you like to feel?'"

"The idea is listening to what people want and taking their desires and needs very seriously to develop technologies that better meet them," she said.

Through the Future Self project in the Centre for De-

sign Innovation and the Living Lab, Pedell and her colleagues were also investigating the use of music and humanoid robots to increase socialisation among dementia sufferers, and refurbishment innovations in older people's homes.

Although fledgling, the work at Swinburne's Living Lab has been recognised with membership to the European Network of Living Labs, a move Pedell said was already fostering global collaborations. ■

Ageing study considers food for thought

Swinburne researchers want to know whether extracts from ancient natural remedies could slow cognitive ageing

An aquatic herb with a 4,000-year history of improving memory function is one of two plants under the spotlight in a Swinburne-led project on cognitive ageing. The research is exploring the idea that

a decline in cognition might be linked to stress at the cellular level.

The project, called ARCLI — the Australian Research Council Longevity Intervention, aims to create a biological map of cognitive decline and determine how plant-based medicines could slow the process. Investigation of the herb, *Bacopa*, will be part of one of the largest trials of its kind conducted in Australia.

As we age, our memory, learning ability and processing deteriorates. Understanding biological mechanisms causing this degeneration in the elderly is incomplete.

ARCLI, led by Professor Con Stough at Swinburne University of Technology's Cen-

tre of Human Psychopharmacology aims to address that gap. "The study will provide the richest source of information about the biological mechanisms associated with cognitive ageing in humans. It was one of the reasons why the study was initially funded by the Australian Research Council," said Stough. "This is significant because age is the biggest predictor of cognitive decline, such as dementia."

The ARCLI trial is gathering data on varied factors that could open a window to understanding cognitive ageing. Considerations include genetic markers, cardiovascular health, inflammation, blood markers, neuro-imaging and even gut bacteria populations.

ENVISIONing liveable and sustainable cities

The negative impacts of urban sprawl could be reduced with the help of a new data tool

The harmful environmental impact of Australia's sprawling low-density cities could be reduced with the use of a new tool developed at Swinburne University of Technology.

ENVISION is a geospatial decision-making tool developed by Dr Stephen Glackin and Professor Peter Newton for the Cooperative Research Centre (CRC) for Spatial Information. It identifies large potential redevelopment sites using indicators that identify economically under-utilised urban assets. It looks for areas where the established buildings are ageing, of poor physical and environmental quality, and where the land value represents more than 70 per cent of the total property value.

Such 'greyfields' sites are key to redeveloping more compact and liveable communities at a precinct level, according to Newton, from Swinburne's Centre for Urban Transitions, a partner in the CRC for Low Carbon Living. Redeveloping the built environment at the precinct level brings an economy of scale and

the opportunity to design more innovative and sustainable buildings.

When cities become more compact, economic and environmental benefits follow, said Newton. "Compact cities can reduce carbon emissions from transport by around one third compared to a low-density city," he said.

Compact cities increase walkability, reducing air pollution and greenhouse gas emissions, and they use less land, water and energy. They are healthier places to live as well as providing greater accessibility to jobs and services.

Australian cities are renowned for being amongst the most liveable in the world, but they rank poorly when it comes to sustainability. Sprawling and car-centric, the cities have eco-footprints double that of those in Europe, and four times the global average.

State governments have targets to increase densities via urban infill, but are not meeting their goals. "Development is happening on an ad-hoc basis in the form of knock-down-rebuilds," said Newton. "They are not necessarily near public transport or service centres, and private green space is typically lost," he said.

ENVISION identifies clusters of properties in the ageing established middle-ring (greyfield) suburbs, typically located between 10 and 30 kilometres from the city centre. As a multi-criteria analysis tool it also highlights those properties close to public transport, schools and other services. "To catalyse the urban regeneration process governments



should consider using old public housing stock to increase dwelling yield and activate neighbourhoods, because it is easier to assemble redevelopment precincts since there is only one owner," said Newton.

"Another possibility is to offer support to communities of private property owners so they can collectively sell their housing in one parcel to developers, providing owners with a 50-plus per cent higher return on their principal asset."

Newton's affiliation with the CRC for Low Carbon Living is developing other products, in collaboration with Swinburne to regenerate greyfields with quality medium-density housing precincts to slow sprawl and reduce cities' carbon footprint. Dr Stephen Glackin, a Senior Research Fellow in the Centre for Urban Transitions, is involved in the community co-design of these low-carbon precincts in Melbourne and Sydney.

Professor Deo Prasad, Chief Executive Officer of the CRC for Low Carbon Living, said it's indicative of the value created from collaboration between the two organisations. "Not only do they provide social benefits, but they create significant economic impact by reducing carbon." ■



Early data have identified an increase in a compound linked to oxidative stress, a state where the body has a concentration of unstable molecules that can break apart crucial cell components, such as proteins and even DNA. Anti-oxidants can prevent cell damage from

oxidative stress and potentially stave off mental deterioration associated with ageing.

Extracts from the *Bacopa* plant (CDRI08) and another natural compound, pycnogenol, are believed to have antioxidant and anti-inflammatory properties and have been shown to improve mental capacity.

ARCLI will be the first long-term study to chart their impact on brain function. "*Bacopa* has been used for about 4,000 years in Ayurvedic medicine and it is technically the oldest known cognitive enhancer amongst plant-based medicines," said Stough. "Pycnogenol is an extract from French maritime pine bark known for its ability to be a strong antioxidant, so this is really testing the hypothesis

that cognition might have something to do with oxidative stress. Importantly, anti-oxidant defences decrease considerably as we get older."

The study has a 360-strong cohort and ARCLI is seeking further recruits aged over 65 to help fill a significant gap in cognitive research. "I think the data will provide high-level evidence about whether *Bacopa* and pycnogenol could be used to improve function," said Stough. "That is important because there are no pharmaceuticals for slowing cognitive ageing, the number of older citizens is growing, and there are no proven interventions to stop dementia, so we definitely need some strategies in that space." ■