"Smart House" Keeps Tabs On Elderly

At 85, Matilda is frail and forgetful. Like a growing number of Floridians, she has reached the stage when living on her own is becoming difficult. But she will avoid an assisted living facility or nursing home for now.

At least she would if she were real.

Matilda is actually a life-size mannequin whose wig and school-marm spectacles symbolize her identity as an elderly person, and her home is an experimental 500-square-foot "smart house" at the University of Florida. The house melds the latest computer and sensor technology to provide automatically the assistance at home that many people need as they age.

Consisting of a fully furnished living room, kitchen, bedroom and bathroom, the house takes up the better part of a fourth-floor computer laboratory in UF's computer science engineering building. Built into this cozy but complete living space is a mind-bending array of experimental assistive-living devices, ranging from a microwave that recognizes entrees and automatically determines how long to cook them to sensors that track an elderly person's whereabouts in the home. These devices are linked by a computer network and keep tabs on each other and, most important, the resident.

"What this home demonstrates is the evolution from assistive devices to assistive environments," said Sumi Helal, an associate professor of computer and information science and engineering. Helal also is director of technology development for the UF Rehabilitation Engineering Research Center on Technology for Successful Aging.

Some other examples of how the smart house makes life easier for aging occupants:

- If water leaks onto the floor, the house senses it and alerts the resident by cell phone.

University of Florida engineering Professor Sumi Helal stands next to Matilda, a mannequin representing the elderly occupant of a UF-developed "smart house" designed to assist people as they age.

- If a visitor comes to the door, sensors pinpoint which room the resident occupies, and a camera beams the visitor's picture to a TV screen there.
- If the resident wants to unlock the door, he or she can tell the cell phone, which then transmits a code to open the electronic latch.

The rehabilitation center, funded most recently with a $4.5 million grant from the National Institute for Disability, Rehabilitation and Research, seeks to help people live alone longer and lower the cost of their care. Although only 10 percent of people in their 60s require assistance in their daily lives, half of men and women 80 or older need outside help, said William Mann, director of the center, and professor and chairman of the occupational therapy department in UF's College of Public Health and Health Professions.

With the oldest of 78 million baby boomers just about to reach their 60s, that spells a huge wave of assistive care needs — and ballooning costs — in the next two decades and beyond, he said.

Mann, who has spent more than a decade studying how technology can help alleviate disabilities associated with aging, said his work revealed elderly people have a "tremendous need" for assistive devices. His studies show that elderly people who obtain and use the devices tend to decline more slowly than those who remain unassisted and they also cost the system less for care, he said.

In the future, caregivers could use the technology to monitor the resident's health remotely. If sensors don't pick up any movement, the caregivers could call the resident or send someone out to check. The house could also "prompt" patients with dementia, who frequently forget what they're doing mid-task.

"We are evolving from pulling a Lifeline-type device to getting the entire environment to help you," Helal said.

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