

Computers and sensors find a home in UF seniors project

By LEW SICHELMAN
SPECIAL TO THE SENTINEL

GAINESVILLE — Meet Matilda. She doesn't realize it — after all, she's a full-size mannequin — but she's helping frail and forgetful seniors remain in their homes long after living on their own becomes difficult.

With her curly gray wig and granny glasses, Matilda is playing the role of an 85-year-old widow who, like most aging seniors, avoids at all costs giving up her freedom and moving into an assisted-living facility, a nursing home or, perhaps worst of all possible scenarios, in with her adult children.

She is part of a "Smart Home" demonstration project on the University of Florida campus that melds the latest in computer and sensor technologies in an effort to help the growing legion of seniors live alone longer, as well as lower the cost of health care.

Matilda "lives" in a 550-square-foot "house" that takes up more than

RETIREMENT LIVING

half the fourth-floor computer lab in UF's computer science engineering building. It has a fully furnished living room, kitchen, bedroom and bath.

In June, she will move to a real and much larger 2,500-square-foot home in the Oak Hammock retirement community on campus. But for now, the "mock-up" is doing just fine.

As is Matilda, because built into her cozy but complete living environment is a mind-boggling array of ex-

perimental assisted-living devices, ranging from sensors that track an elderly person's whereabouts in the house to a microwave oven that recognizes entrees and determines how long to cook them.

Connected to a computer network, these and other devices keep tabs on each other and — most important — the occupant, which is the reason for the electronic sensors placed discreetly on Matilda's clothing.

"What this home demonstrates is the evolution from [assistance] devices to [assistance] environments," says Sumi Helal, an associate professor in the university's computer and information science and engineering department.

Helal also is director of technology development for the UF Rehabilitation Engineering Research Center on Technology and Successful Aging, funded most recently with a \$4.5 million grant from the National Institute for Disability, Rehabilitation and Re-

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Sensor technology exists but integration is lacking

SMART HOUSE FROM J1

search.

The research center was established in October 2001 to promote independence and quality of life for older people with disabilities. The core focus is on communications, home monitoring and smart technology.

The smart-house project is said to be the next great leap in technology-assisted home care. It assembles what now is an assortment of individual and disconnected assisted-living devices into a coordinated, centralized computer network that can observe, respond and communicate with occupants, their caregivers and health providers.



HELAL

Helal believes wholly integrated assisted-living environments like the one being tested are less than a decade away from moving out of the experimental stage and into the mainstream.

"The technology is there," he says. "We just have to figure out how to integrate the various parts."

Surreal surveillance

The home of the not-too-distant future works on three levels of impairments — motor, cognitive and therapeutic. Here's how the home might make life easier for its aging occupants:

- If water leaks onto the floor, someone who does not see too well might slip and fall. But in the smart house, a sensor alerts the resident of the danger by cell phone.

- When the mail arrives, another sensor notifies the resident. That way, someone who has arthritis or is wheelchair bound and doesn't move around easily can make one trip to the mailbox.

- If someone comes to the

door, sensors locate the resident and a camera beams the visitor's picture onto a TV screen in the room he or she occupies. If the resident wants to let the visitor in, she can tell the cell phone, which will transmit a code that opens the electronic latch.

- The microwave will "read" a bar-codelike radio frequency identification tag on the food package and set the proper cooking controls so the user doesn't have to punch in any numbers or choose a power setting.

It also will tell the resident how to handle the package and notify her when the food is ready via a video display in whichever room she happens to be in at the time.

- The house also can keep tabs on certain developing infirmities. For example, if

the resident's gait becomes slower, which may be a sign of an impending stroke, a monitor will report the potential problem to the occupant's caregiver. If sensors don't pick up any movement at all, someone will be notified right away.

- The resident can enjoy meals with her children and grandchildren via television. "It's like they're actually right there with you," says Helal. "You can see your son and his family on the screen. You can even see their plates and what they are eating. It's almost real."

- With voice commands, the mobile phone can be used to turn on lights, the stereo and the television, and it can open and close the curtains.

- When the occupant moves from room to room, the house senses it. It turns off the television monitor in the room the resident leaves, turns on the monitor in the room she enters and tunes in the proper station.

- If the resident can't remember whether the front door

Inside the Smart Home

Computer and sensor technologies are showcased in a University of Florida project that aims to help frail seniors live in their homes longer.



SOURCE: University of Florida computer and information science and engineering department

is locked, she can ask the mobile phone if the house is secure. The phone will check the doors and report by voice.

Changes in thinking needed

Matilda's house is a place where, Helal says, "we can try our ideas so we can see how they actually play out."

But it will take a concerted effort from policy-makers, who must decide whether monitoring seniors is acceptable practice or an invasion of privacy, and from retailers, who must sell products with imbedded radio frequency identification tags that can be read by the sensors, the professor says.

Mostly, though, the responsibility "will fall on the shoulders of the construction industry," which must decide to absorb the smart-sensor technology into new and remodeled houses.

They had better hurry, says William Mann, director of the rehabilitation engineering research center on technology for successful aging and chairman of the occupational therapy department in UF's College of Health Professions.

With the oldest of the nation's 78 million baby boomers just about to reach their 60s, Mann says, "a huge wave" of assisted-care needs is on the horizon.

Only 10 percent of people in their 60s require assistance in their daily lives, but half of those 80 or older need outside help with what were once life's simpler tasks — bathing, dressing and remembering to take medications.

"The real problem for how we're spending health-care dollars is going to occur in 20 years," Mann says. "But many people will need [assisted] care before then."

Mann, who has spent more than a decade studying how technology can help alleviate disabilities associated with aging, says his work has shown

that there is a tremendous need for assisted-living devices.

His studies have shown that seniors who use the devices tend to decline more slowly than those who don't. They also cost the health-care system less.

And contrary to the notion that older people don't do well with new technology, Mann says they welcome the help. He recites what an older woman told him after receiving a computer: "I used to wake up every morning and pray for God to take me now. Now I wake up every morning and ask God to give me more time on the computer."