

High-tech 'Smart Care' apartment aims to improve health care for seniors

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UT Arlington Computer Science and Engineering Professors Manfred Huber and Gergely Zaruba test flooring with special sensors that will enable researchers to measure and evaluate changes in walking gaits and weight that might suggest illness or injury in residents. Credit: UT Arlington

University of Texas at Arlington nursing and engineering researchers will unveil a model "Smart Care" apartment next month that is infused with intelligent care technology designed to reduce risks encountered by older adults and those with disabilities who want to live independently in their own homes.

The federal Health Resources and Services Administration provided more than \$600,000 in funding for the five-year project, which has been a collaborative effort involving premier faculty from the UT Arlington College of Nursing and Health Innovation and the College of Engineering. U.S. Rep Joe Barton, R-Arlington, advocated for the funding and said he is eager to see how the project - described as the first of its kind in Texas - will improve lives.

A grand opening event is scheduled at the Smart Care apartment at 10 a.m. May 7, 2015, at the Lakewood Village Senior Living Community, 5100 Randol Mill Road in Fort Worth.

"UT Arlington is at the forefront of life-changing and innovative research in the area of Health and the Human Condition," Barton said. "Ultimately, Smart Care will positively impact senior citizens, people with disabilities, and injured veterans. It will also save money for people across the Dallas-Fort Worth area and nationwide by reducing the number of repeated trips to hospitals for some residents."

Christian Care Senior Living Communities generously contributed use of a 900-square foot, two-bedroom apartment at its Lakewood Village Senior Living Community in Fort Worth for the project.

"The entire Smart Care concept attracted us from the beginning because it just truly aligned with our mission to compassionately care for adults well into their golden years," said Phil Elmore, president and chief executive officer of Christian Care Senior Living Communities. "This

has been a wonderful symbiotic partnership and we are proud to be a part of the work that UT Arlington is doing to expand horizons for senior citizens and people with physical challenges."

Carolyn Cason, co-principal investigator and professor of nursing, created the concept for establishing a Smart Care center at UT Arlington and a Smart Care apartment. She said the growing senior population and increasing number of Americans living with disabilities urgently demand research such as this.

"The technologies developed in the context of Smart Care will enable a significant improvement in preventive in-home health care for the aging, improve the efficiency and cost effectiveness of care by [health care professionals](#), and improve the ability to directly involve family and friends into the care process."

Among other technologies, the Smart Care apartment includes:

- Sensors underneath tiles on the floor that will allow researchers to measure and evaluate changes in walking gaits and weight that might suggest illness or injury;
- A special camera embedded in a bathroom mirror that will tell researchers about day-to-day heart rate, facial expression, and skin color. Changes in expression and skin color can reveal aspects of the overall health status as well as about oxygen content of the blood;
- Lift chair to help residents stand;
- Smart appliances such as an LG microwave, range and refrigerator;
- Connected exercise equipment, including a recumbent bike and interactive Kinect-based Tai Chi trainer;
- Other systems that will detect whether medication is being properly managed or if the resident is not sleeping well or staying

in bed too long.

Kathryn Daniel, an associate professor and director of the Adult-Gerontology Primary Care Nurse Practitioner Program in the College of Nursing and Health Innovation, serves as program manager for Smart Care. During a tour of the apartment in early April, she provided a behind-the-scenes look at the technology and explained how it will benefit clinicians, patients, families, and facility administrators. Watch a short video [here](#).

The congressionally earmarked funding that Barton championed was used to purchase the high-tech kitchen appliances, a special toilet, automated beds, living room furniture, and other equipment in use at the Smart Care apartment, as well as at the center located in the UT Arlington Engineering Research Building.

The lab serves as mission control where researchers can unobtrusively monitor patients, interpret behavioral information and other data, and evaluate remote capabilities, health technologies and other protocols.

"Ultimately, the goal is to have these technologies in homes so that people could have warning signs if something is changing; you could also detect if something has already happened and there is a need to call for help," said Manfred Huber, co-principal investigator and professor in the UT Arlington Department of Computer Science and Engineering. "Again, the hope is that people can stay home much longer than they can currently." Watch a short video [here](#).

Provided by University of Texas at Arlington

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