WSU smart-home research expanding

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Roschelle "Shelly" Fritz gave a presentation on her smart-home research at Greater Spokane Incorporated on June 19, 2018.

A pilot project led by WSU scientists that's using smart-home technology for health care is expanding to other locations and uses.

Faculty researchers in nursing, computer science, and psychology have been testing the technology and processes at a retirement community in Spokane, in a project involving subjects who have a chronic illness.

That research has expanded to include sites in Beaverton, Oregon, and in Southwest Washington involving people

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with dementia. Additional projects are in the works for Parkinson's research in Vancouver, Washington, and among people with multiple chronic illnesses in Australia.

Roschelle "Shelly" Fritz, assistant professor in the College of Nursing in Vancouver, is working on the projects with Diane Cook, the Huie-Rogers chair professor in the School of Electrical Engineering & Computer Science; and Maureen Schmitter-Edgecomb, the Herbert L. Eastlick professor in the Department of Psychology. The three WSU scientists were awarded a $1.77 million grant from the National Institutes of Nursing Research last summer. They and two other researchers garnered an additional $912,000 NIH grant to develop online tools related to the research.

The research brings together the analytics produced by smart-home sensors and the judgment and experience of health-care professionals to create an automated health assessment. For example, the sensors might record movement as someone gets up to get a glass of water each night, a pattern that the clinician flags as relevant; then the engineers train the computer to recognize similar patterns that could be encountered in the future.

Since the project launched at Touchmark on South Hill, a retirement community in Spokane, "The big thing we've learned is that engineers can train the artificial intelligence agent to recognize a change in health state with greater than 90 percent accuracy," Fritz said recently. "We have three examples of that" from the work done at Touchmark.

Second, the data is valuable for making health care decisions, she said. The three researchers had computer science and psychology students organize the data collected by in-home sensors and telehealth visits, then asked nursing students to evaluate it.

"We asked them, 'Could you use this to make a clinical

NIH-funded research up significantly at College of Nursing

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decision?'" Fritz said of the changes in movement or behavioral patterns. "'Would you prescribe something or change the treatment regimen, based on this new type of information?' The answer was resoundingly yes."

Fritz said she's also working on a related study with Connie Nguyen-Truong, an assistant professor in the College of Nursing in Vancouver, on cultural perspectives toward smart-home technology among older Asian immigrants. Fritz said the goal is to deploy five smart-homes in that community, and they're working with a strong and respected community partner, Asian Health and Service Center.

"To date our sample has been primarily white people, and that's a problem," she said. "We already know that implicit bias exists in artificial intelligence, because a lot of middle- and upper-class white people are doing the programming. So we're going to purposefully look to infuse non-white voices into AI by diversifying our sample and by providing annotated data sets and narratives of minority experiences with the smart home to the programmers, and that's going to be huge."

Fritz was invited to discuss her research this summer at the National Institute of Nursing Research, and will teach others how to see changes in people's health based on sensor data. She's developing a framework she calls the Fritz Method that clinicians can follow. "I'm only one person, but using the Fritz Method, any clinical person can provide ground truth for data sets used to train the AI agent," she said.

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