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Can wearable technology help older adults maintain healthy lives?

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Older adults who are physically activity are more likely to remain healthy and maintain their independence. Research indicates that self-tracking of physical activity supports healthy living for people of all

ages, but older adults have been slower to adopt new technologies like movement trackers. A new project funded by the National Science Foundation will examine how to leverage wearable technology to encourage older adults to be more active.

David Conroy, professor of kinesiology and human development and family studies at Penn State, is collaborating with a team of leading researchers from the University of Maryland's College of Information Studies (iSchool) in this study. The project team is developing innovative wearable technology tailored to track the movements and activities of older adults, age 60 and over. Combined with the development of teachable interfaces, the project aims to enhance the motivation of older adults to engage in physical activities and with their own health data. The project team also hopes to see a reduction in mobility problems, health problems, and resultant barriers to quality of life for older adults.

"Smart watches and other activity tracking technologies have become widely available over the years, making self-tracking easier than before, but older adults have adopted them less," said Eun Kyoung Choe, principal investigator from the University of Maryland team and associate professor at the iSchool. "One barrier is that current physical activity trackers do not effectively identify and track older adults' activities. Wrist-worn devices are able to pick up steps, but they can also pick up other arm movements that could skew step counts."

Self-tracking physical activities can support people of all ages in understanding their lifestyle behaviors, making healthy choices, and reducing the risks for chronic disease. For older adults in particular, movement behaviors are especially critical as they help to maintain functional abilities and allow them to live independently.

For older adults, this measurement challenge is even greater because

they often walk slower so the signal from movement is subtler.

"We're going to expand beyond capturing the frequency, intensity, and timing of step counts to detect the type of physical activities that older adults are doing," according to Conroy, "Developing the technology needed for older adults to teach connected devices how to recognize different types of activities in their daily routine will improve health and safety monitoring and create new possibilities for behavioral interventions to promote healthy aging."

Based on understanding older adults' movement and non-movement activities that they wish to change, the research team will design and develop new, personalized, multimodal activity trackers that provide opportunities for self-reflection through teachable interfaces. Teachable interfaces allow users to teach the system how to recognize their movements more accurately by fine tuning it to their idiosyncratic movements. The team will also investigate the similarities and differences in usability for subgroups of older adults, such as people with mild dementia, and the adjustments needed to accommodate them.

The team includes experts in human-computer interaction, health informatics, interactive machine learning, accessibility, aging, kinesiology, and physical therapy. The University of Maryland team will lead the design and development efforts, while the Penn State team will provide content area expertise on older adults' physical activity, interpret findings from the co-design process, and assist with logistics for and interpretation of findings from the deployment studies.

Provided by Pennsylvania State University

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