Falls are a major public health issue and the leading cause of injury-related death in older adults. Falls can lead to chronic pain, disability, loss of independence, and high financial burden. Most falls occur during walking, and gait analyses have been used to predict those who are at greatest risk of falling. Higher risk of falling is associated with slower gait speed, increased stride time variability, increased step length variability, and increased step width variability. Identification of those at risk of falling allows interventions. Comprehensive gait analyses are difficult to obtain. An accurate and inexpensive gait tracking device is critically needed.

SMART-GAIT™

Professor Babak Ziaie of the School of Electrical and Computer Engineering and Professor Shirley Rietdyk of the Department of Health and Kinesiology have developed Smart-Gait™, a low cost and accurate gait assessment system. Smart-Gait™ consists of a smartphone with a 90-degree tilted wide-angle lens and a special app to record and calculate gait information; i.e., step length, width, time, speed, double support, and trunk motion. The smartphone is worn on the waist and records a person’s gait by monitoring the motion of foot fiducial markers affixed on the shoe. Smart-Gait™ is a simple tool that health care professionals can send home with patients to get a thorough assessment of gait pattern in a natural environment. The gait data can then be downloaded and analyzed in order to initiate preventive measures such as exercise, physical therapy, or vision correction. Professor Ziaie conducts research in Discovery Park’s Bindley Bioscience Center and Birck Nanotechnology Center and Professor Rietdyk has been a Fellow in Discovery Park’s Entrepreneurial Leadership Academy.

According to Dr. Peter Altenburger, PhD, Physical Therapist, Co-Chair Department of Physical Therapy, Indiana University School of Health and Rehabilitation Services: “The ability to assess gait parameters while patients are in their own homes will improve knowledge of the impact of disease and disability on everyday activities. Further, this information can be used to more fully assess the efficacy of rehabilitation.”

Scan to view a video about SmartGait technology.