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Gait Analysis For Predicting Falls in Elderly Using Smart Phone's Camera

A low-cost, easy-to-use smartphone-based system uses camera features for gait analysis, efficiently measuring stride parameters to assess and predict fall risk.

Falling is a major health issue among older adults (aged 65 and over). According to the CDC, one out of three older adults fall each year, and in 2010, 2.3 million nonfatal fall injuries among older adults were treated in emergency departments. Early identification and prediction of fall risk is likely to help minimize actual falls and the development of secondary problems such as reduced confidence and activity levels. Current methods include accelerometers, gyroscopes, and pressure sensors embedded in shoes; however, these methods are hard to use, not portable, and expensive.

In response to the need for a more efficient and effective gait analysis and fall detection system, researchers at Purdue University have developed a novel gait analyzer and fall predictor that can measure stride length, stride time, velocity, and cadence using a camera feature in a smartphone-type device attached to a user. The gait analysis initiates when the user stands and the foot identifiers are recognized by the camera and software. The low cost and high accessibility of the gait analyzer and fall predictor device means that the fall risk can be assessed with an easy to use, unobtrusive solution when compared to existing expensive methods.

To view a video related to this technology, click on this link: http://www.youtube.com/watch?v=oLXnTx6Rb6A

Advantages:

-Multiple measurements - stride length, stride time, velocity, and cadence

-Low cost, easy to use, and unobtrusive

Potential Applications:

-Medical/Health

Technology ID

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Category

Artificial Intelligence & Machine Learning/Computer Vision & Image Recognition

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View online

-Senior healthcare

-Fall prediction/prevention

TRL: 6

Intellectual Property:

Copyright, 2013-10-29, United States | Provisional-Patent, 2014-01-07, United States | Trademark, 2014-12-12, United States | Utility Patent, 2015-01-07, United States | DIV-Patent, 2017-10-31, United States | Utility Patent, N/A, United States

Keywords: gait analysis, fall detection system, fall predictor, smartphone camera, stride length, stride time, velocity, cadence, senior healthcare, fall prevention, Gait, Mechanical Engineering, Medical/Health, Smartphones