SwayWatch: A Smart Phone App to Quantify Balance

A simple, smartphone-based application uses camera-captured motion markers to quantify body sway, offering a low-cost, accurate method for monitoring changes in balance related to traumatic brain injury and serving as a biomarker for diseases such as Alzheimer's and autism.

According to the Center for Disease Control and Prevention, the number of sports related traumatic brain injury (TBI) visits to hospital emergency rooms grew to 248,416 children (age 19 or younger) in 2009, an increase of 57 percent compared to 2001. In addition, TBIs were recently linked to costly and life altering medical problems such as Alzheimer's. Many sports leagues have taken an initiative to reduce TBI related risks by implementing new rules, but these guidelines are very subjective and difficult to determine. Therefore, there is a need for low-cost technology that can quickly and accurately determine the severity of head injuries.

Researchers at Purdue University have developed an application for smartphones where the camera captures the motion of markers on the feet and/or ground while a person is standing. The motion of the markers is directly correlated to the person's trunk motion, which is used to quantify the body sway. The body sway can be used to quantify changes in balance resulting from a TBI in athletes. In addition, this technology can be used as a biomarker for diseases, such as Alzheimer's and autism. This technology is an effective and economical alternative given it relies solely on a smartphone.

Advantages:

-Superior accuracy

-Simple and economical compared to current solutions

-Better quantification of sway

Potential Applications:

Technology ID

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Category

Biotechnology & Life Sciences/Biomarker Discovery & Diagnostics
Artificial Intelligence & Machine Learning/Computer Vision & Image Recognition

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View online

-Capture the motion/sway of a person standing

-Biomarker for diseases, such as Alzheimer's and autism

-Monitor athletes following a TBI

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Intellectual Property:

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Keywords: Smartphone TBI assessment, Body sway quantification, Concussion screening app, Low-cost head injury detection, Balance change measurement, Smartphone biomarker, Alzheimer's disease biomarker, Autism biomarker, Motion capture body sway, Economical TBI monitor, Athletic Training, Computer Technology, Medical IT, Medical/Health, Mobile Apps, Smartphones, Sports Injuries, Traumatic Brain Injury