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Assessing the risk of fall in older people through turning test

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The feasibility of recognising elderly subjects at risk of falling is explored by generating a Biometric Signature Trajectory (BST) for each subject while turning. Turning is a risky activity for elderly subjects and can lead to falling as it needs greater centre of mass (COM) balance control. The study is based on 45 older and 10 younger subjects. The elderly subjects were categorized into two groups of elderly non-fallers and elderly multiple-fallers based on their history of fall. Subjects were asked to turn a full circle clockwise and then anti-clockwise without stopping between. The angular rotation of chest, pelvis, left legs, and right legs were recorded using a set of inertial sensors. For each subject a unique signature was generated based on a combination of the recorded data of different body parts. DTW (Dynamic Time Warping) was used to measure the similarity of the BST of younger subjects and elderly fallers and elderly non-fallers. The approach is described. It is shown that the proposed method has the potential of identifying elderly subjects with disturbed balance and history of multiple falls from the elderly subjects with no history of fall.

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