

A NOVEL ALGORITHM FOR DETECTION HUMAN FALLING

ABSTRACT

Falls are major problems that could have happened to elderly, and could cause paralysis, hip fractures, or could lead to disabilities or accidental deaths. An algorithm for accurately detecting the falls is necessary in order to decrease the rate of disabilities or accidental deaths. In this paper, a new algorithm to detect the falls from the acceleration signal using the wavelet transform and multilayer perception neural network is proposed. In our experiments, 5 volunteers who were healthy with the ages between 21 to 25 year old were asked to attach a tri-axial accelerometer at the right side of their waists. The orientation of the accelerometer was vertical direction. Next, the volunteers were asked to perform 5 daily-life activities: 1) walking 2) standing up from a chair 3) sitting down on a chair 4) lying down on a bed and 5) getting up from a bed; and 5 falling activities: 1) falling forward 2) falling backward 3) falling to the right side 4) falling to the left side and 5) falling while standing up. The experimental results of the human activity classification that the proposed algorithm gave the maximum precision value (0.856). Moreover, it can be seen from the experiments of the falling detection that the proposed algorithm gave the maximum precision value (1.000)

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