

SIMULATION AND EVALUATION OF ACCELEROMETER-BASED FALL DETECTION ALGORITHMS

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Abstract:

Fall are dangerous for the aged population as they can adversely affect heather. Base on the importance and necessary of issue raised, recently, many being fall down detection methods were developed aiming at monitoring the health of the elderly. Used popular the most, device including a sensor and a microcontroller. In which, a sensor recode data from accelerometer and using microcontroller to analysis, send alert when fall occurs.

In this thesis, I focus to develop algorithms and the corresponding simulations to monitor the falling event. It can discriminate between being fall down and the daily activities of human such as standing, walking, sitting, lying. First, data were collected from an accelerometer sensor which is highly exact and stable. The outputs of this sensor are value of acceleration three axis measurements: ax, ay, az. This sensor is put on the belts, where can investigate exactly postures of human activities. Then, MATLAB simulation software was used to combine with algorithms aiming at threshold analyzing initial values. Being fall down are identified in the posture daily activities of human, based on the sudden change of acceleration magnitude between the states. I also investigated carefully the effects of choosing the threshold (to determine the falling event) and the window size (to determine the time frame for analyzing). After that, we can select the most suitable values for these parameters in order to achieve the best performance.

Keywords: recognition, accelerometer.