HUMAN ACTIVITIES & POSTURE RECOGNITION

Innovative algorithm for highly accurate detection rate

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EXECUTIVE SUMMARY

The main purpose of thesis is to introduce new innovative algorithm for "unintentional fall detection" with 100% accuracy of detecting falls on hard surfaces which can cause severe and sometimes fatal injuries. Furthermore this thesis explains how to detect deliberate human activities such as running, walking etc using the same algorithm with near perfect accuracy. Subset of the above mention algorithm is used for posture recognition as well.

The above mentioned algorithm is converted into computer software using java programming language for real time detection. A graphical user interface is developed to display human posture and activity information.

Most pre-existing algorithms need expensive and wide range of sensors to achieve this level of accuracy. In this thesis it explains how to use just one tri-axial accelerometer with wireless zigbee communication module and achieve far better accuracy. Most of the other sensor types violate human privacy therefore they are unethical to be used at residence of vulnerable elderly or sick individual and majority of them are very expensive when compared to a tri-axial accelerometer which costs just around NZ$5.

Intended target audience: Engineers with mathematical and data analysis background.

Overview of the developed system