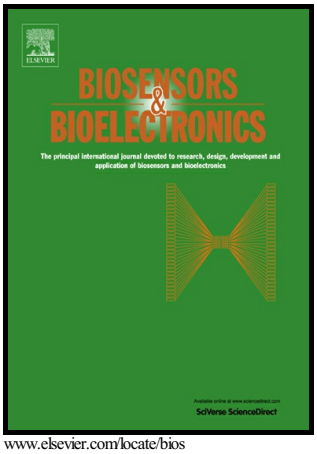

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Increasing Trend of Wearables and Multimodal Interface for Human Activity Monitoring: A Review

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Abstract
Activity recognition technology is one of the most important technologies for life-logging and for the care of elderly persons. Elderly people prefer to live in their own houses, within their own locality. If, they are capable to do so, several benefits can follow in terms of society and economy. However, living alone may have high risks. Wearable sensors have been developed to overcome these risks and these sensors are supposed to be ready for medical uses. It can help in monitoring the wellness of elderly persons living alone by unobtrusively monitoring their daily activities. The study aims to review the increasing trends of wearable devices and need of multimodal recognition for continuous or discontinuous monitoring of human activity, biological signals such as Electroencephelogram (EEG), Electrooculogram (EOG), Electromyogram (EMG), Electrocardiogram (ECG) and parameters along with other symptoms. This can provide necessary assistance in times of ominous need, which is crucial for the advancement of disease-diagnosis and treatment. Shared control architecture with multimodal interface can be used for application in more complex environment where more number of commands is to be used to control with better results in terms of controlling.

Keywords— Human activity monitoring, Human Computer Interface, wearable sensors, smart sensors, multimodal interface, biomedical, shared control architecture

1. Introduction

Activity monitoring aims to monitor the actions of agents obtained from a number of observations on the actions of agents and conditions of the environment. Activity recognition plays an important role in ambient living environments to assess changes from the normal behavior of elderly people (Uslu et al., 2013). The objective of activity monitoring is to analyse or interpret the ongoing events from data automatically. Since 1980s, this field has grasped the attention of many researchers due to its ability to provide personalized support for several applications which include patient monitoring, surveillance and many different varieties of systems involving interactions between machines and persons such as Brain-Computer Interfaces (BCI).

Activity monitoring includes two processes: data acquisition followed by classification of acquired data. The acquisition of data includes acquiring the bio-signals and signal

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