

Using Mobile Phones for Monitoring Physical Conditions

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Over the past few years, many mobile phones are equipped with sensors that can capture information related to physical variables such as acceleration. As the mobile phone is carried by the user, these physical variables, e.g. acceleration recorded by accelerometer of mobile phone can provide some information related to physical activity of the user. Accelerometer sensors have been used for activity analysis and classification [Lee02, Bao04, Yang05], however we propose to use accelerometers integrated in a mobile phone for such a purpose. The mobile phone equipped with these sensors should be carried normally by the user in his pocket. Results of examination can be presented to the user in different ways as an indication of different health related factors. In addition to presenting these data to the user, the mobile phone can optionally analyse them, or send them to a server for further analysis. The main idea is that the mobile phone analyses physical activity pattern of the user and compare it against normally accepted pattern for the same user, or normally accepted activity pattern for the users of same age.

This analysis can be used for early detection of symptoms of diseases. Many diseases initially show themselves in the way the pattern of physical activity for a person changes. The system can check if there is any dramatic change in the pattern of physical activities and issue warnings in such cases. It can additionally provide certain advices by comparing the pattern of activities over different periods of day/week/month with a reference activity pattern for the same period. In all these cases, if the mobile phone detects something suspicious regarding health, it can inform the user or a designated person such as a medical doctor. Such a system can be also used to take care of elderly or people with certain diseases by constantly and precisely monitoring pattern of their physical activities. It can reduce the risk of fall for elderly or patients by early detection of signs in walking or standing pattern which can lead to sudden fall. As another application, the mobile phone can be used to analyse the progress of a user/patient after taking certain medication or surgery. Again in this case, activity pattern of the user can be used as a good indication of health progress.

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