

Behavioural analysis through Smart Watch derived activity monitoring

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Activity monitoring is usually based around the parallel recording of a number of measurements through an inertial measurement unit (IMU). In an IMU the primary means to record activity is through accelerometry. Through the recording of tri-axis accelerometry of an IMU attached to a human during everyday activities it becomes possible to obtain an indication of human behavior.

We have developed an IMU based around an off-the-shelf Android Smart Phone in a watch form factor – a Smart Watch. The Smart Watch records tri-axis accelerometer continuously, save the data/ uploading the data to a server for analysis of behavior.

Whilst some of the more usual measures of interest to extract from such an IMU include *step count* and *energy expenditure*, it is particularly useful to be able to detect the presence of *transitions* in the data. Transitions include actions such as: stand-to-sit, sit-to-stand, walking-to-stopped walking, etc. Through the accurate detection of transitions over longer periods of time it becomes possible to obtain an idea of so-called *activities of daily living* (ADL). ADL is very useful in the analysis of many disorders or conditions – including using an IMU to measure rehabilitation as well as measuring levels of independence in the elderly.

This project concerns the development of an automated transition detection technique on both prerecorded Smart Watch accelerometry data recordings, as well as the possibility of generating new data to suite the particular transition detection method under research.

Further information on this project can be obtained on request from: C.James@warwick.ac.uk