Physical Activity Classification using the GENEA wrist-worn accelerometer

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This paper describes methods developed to classify physical activities into walking, running, household or sedentary activities based on raw acceleration data from the GENEA and compares classification accuracy from a wrist-worn GENEA with a waist worn GENEA.

Three GENEA accelerometers were worn by each subject during data collection; one at the waist, left wrist and right wrist. Data were collected at 80Hz. Features were extracted from raw data using fast Fourier transform and wavelet decomposition. Machine-learning algorithms were used to classify running, walking, household and sedentary daily activities. The results state that the developed algorithms can accurately classify the activities of daily living. Classification accuracy of 0.99 for waist-worn GENEA, right wrist (0.97) and left wrist (0.96). This performance is comparable to waist-worn accelerometers for the assessment of physical activity.

The complete abstract can be viewed or publication purchased by following the link:

http://journals.lww.com/acsm-msse/Abstract/2012/04000/Physical_Activity_Classification_Using_the_GENEA.22.aspx