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## **Activity Classification of Manual Wheelchair Users with Wearable Sensors**

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### **ABSTRACT**

Wearable sensors are increasingly used to monitor and quantify physical activity types and levels in a real-life environment. In this project we studied the activity classification in manual wheelchair users using wearable sensors. Nine subjects performed a series of representative daily life activities in a semi-structured setting with a datalogger and an eWatch that collected wheelchair velocity and wrist acceleration. Features were extracted from the sensors and fed into Support Vector Machines (SVM) and Naive Bayes algorithms to classify the activities into four categories. The results indicated that the SVM and Naive Bayes were able to classify these activities into four categories (self propulsion, external pushing, sedentary activity, non-activity) with an accuracy of 82.8% and 77.3%, respectively.

### **KEYWORDS:**

Wheelchair propulsion; activity classification; wearable sensors; machine learning; wheelchair users

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