# Investigating Activity Recognition Using 9-Axis Sensors and Filters in Wearable Devices

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**Abstract :** In this paper, we analyze major components of activity recognition (AR) in wearable device with 9-axis sensors and sensor fusion filters. 9-axis sensors commonly include 3-axis accelerometer, 3-axis gyroscope and 3-axis magnetometer. We chose sensor fusion filters as Kalman filter and Direction Cosine Matrix (DCM) filter. We also construct sensor fusion data from each activity sensor data and perform classification by accuracy of AR using Naïve Bayes and SVM. According to the classification results, we observed that the DCM filter and the specific combination of the sensing axes are more effective for AR in wearable devices while classifying walking, running, ascending and descending.