**HUMAN ACTIVITY RECOGNITION**

**ABSTRACT**

Human activity recognition, or HAR for short, is a broad field of study concerned with identifying the specific movement or action of a person based on sensor data.

The sensor data may be remotely recorded, such as video, radar, or other wireless methods. It contains data generated from accelerometer, gyroscope and other sensors of Smart phone to train supervised predictive models using machine learning techniques like SVM , Random forest and decisiontreeto generate a model. Which can be used to predict the kind of movement being carried out by the person which is divided into six categories walking, walking upstairs, walking down-stairs, sitting, standing and laying .

MLM and SVM achieved accuracy of more than 99.2% in the original data set and 98.1% using new feature selection method. Results show that the proposed feature selection approach is a promising alternative to activity recognition on smartphones.

**GOALS**:

we can determine what is normal and what is abnormal activity for them therefore indicating whether they require attention from facility staff.

Innovative approaches to recognize activities of daily living (ADL) is essential input part for development of more interactive human-computer applications.

Methods for understanding Human Activity Recognition (HAR) are developed by interpreting attributes derived from motion, location, physiological signals and environmental information.

Effectiveness of machine learning methods are compared with published Multi Class Hardware-Friendly Support Vector Machine (MC-HF-SVM) recognition accuracy.

**RELATED WORKS:**

Several investigations have considered the use of widely available mobile devices. Ravi et. al. collected data from only two users wearing a single accelerometer-based device and then transmitted this data to the phone carried by the user (Ravi et al.,2005). Lester et. al. used accelerometer data from a small set of users along with audio and barometric sensor data to recognize eight daily activities (Lesteret al., 2006). However, the data was generated using distinct accelerometer-based devices worn by the user and then sent to the phone for storage.

Some studies took advantage of the sensors incorporated into the phones themselves. Yang developed an activity recognition system using a smartphone to distinguish between various activities (Yang, 2009). However, stair climbing was not considered, and their system was trained and tested using data from only four users. Brezmes et. al. developed a real-time system for recognizing six user activities (Brezmeset al., 2009). In their system, an activity recognition model is trained for each user, i.e., there is no universal model that can be applied to new users for whom no training data exists. Bayat et al. gathered acceleration data from only four participants, performing six activities. (Bayat et al., 2014) Shoaib et al. evaluated different classiﬁers by collecting data of smartphone accelerometer, gyroscope, and magnetometer for four subjects, perfoming six actvities. (Shoaib et al., 2013)

**PROBLEM STATEMENT**:

The purpose of being able to classify what activity a person is undergoing at a given time is to allow computers to help and guidance to a person prior to or while undertaking a task.

The difficulty lies in how diverse our movements are as we perform our day-to-day tasks.

There have been many attempts to use the various machine learning algorithms to accurately classify a person’s activity, so much so that Google have created an Activity Recognition API for developers to embed into their creation of mobile applications