

# Human Activity Recognition Using Machine Learning

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## Abstract:

This research is for understanding and integrating human activity with computer system. Our research targets to collect human body motion using smartphones with embedded initial sensors. The recorded information stored in the activity recognition database are classified using SVM and KNN classifier ; thus results are obtained through further modeling.

## Introduction:

Human activity recognition identifies human actions analyzing a set of observations retrieved from environment or sensors. Sensors can be body worn used in different body parts such as waist, wrist, chest, thighs etc. Though these sensors are uncomfortable to use but they provide noticeable performance. Smartphone is another sensing tool with built-in sensors such as accelerometers, gyroscopes, dual cameras and microphones. All of these provide flexibility while monitoring Activities of Daily Living (ADL). Dataset being used in our research has been created using smartphones with above mentioned sensors, targeting six human activities recognition which are sitting, standing, walking, walking upstairs, walking downstairs and laying down. Therefore, results are obtained by exploiting SVM and KNN classifiers.

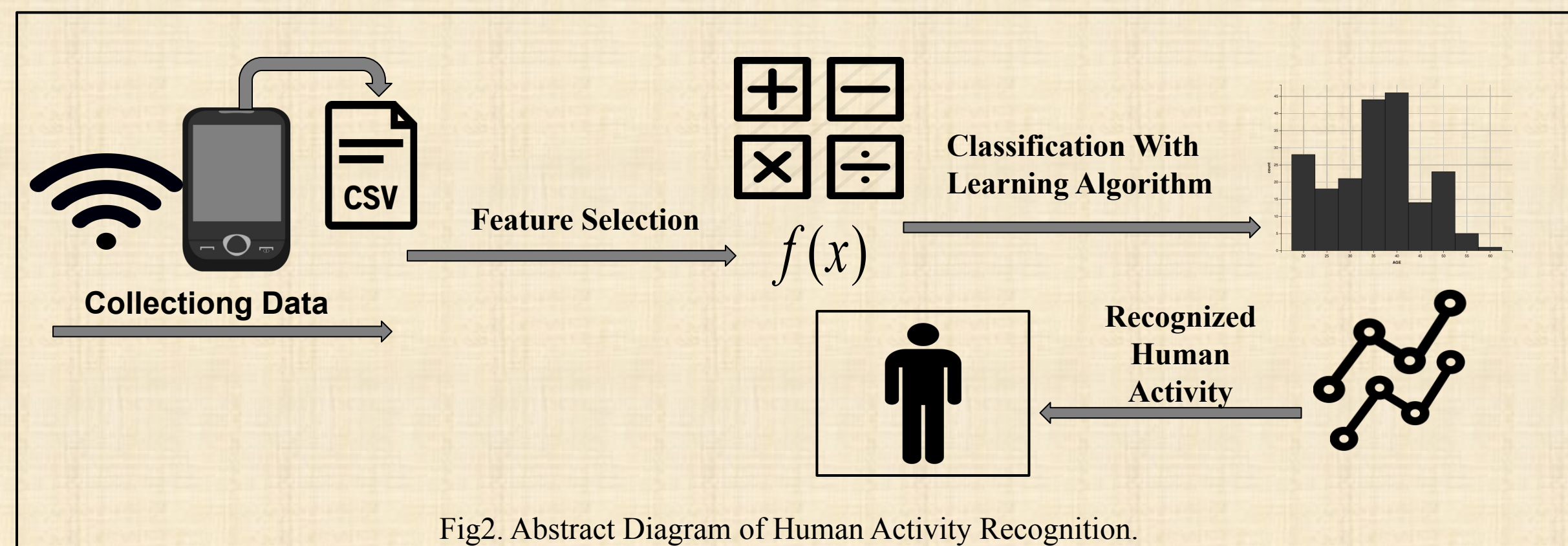
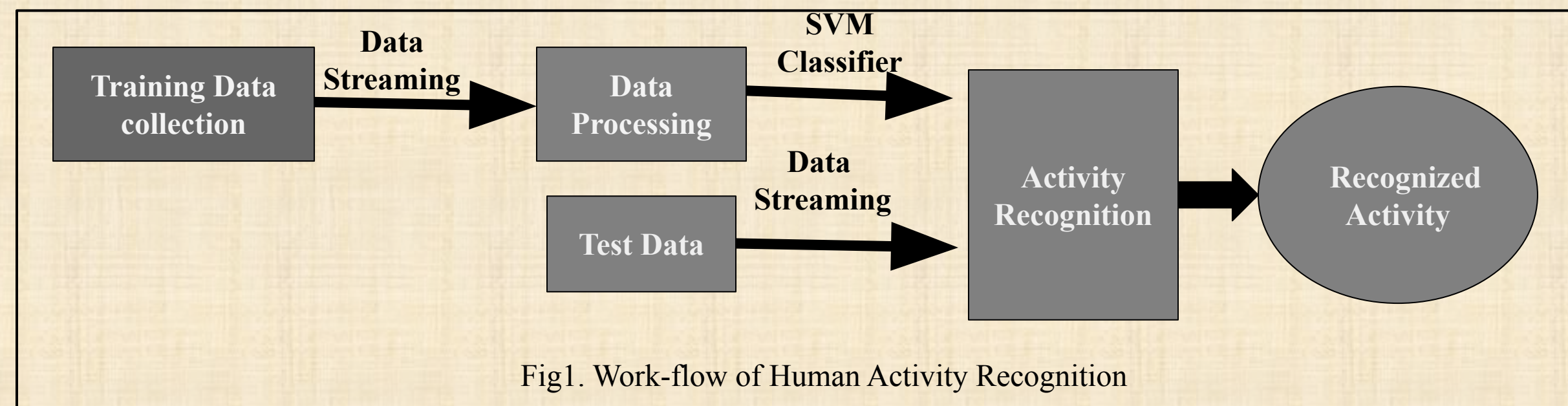
## Literature Review:

From the paper, the research team introduced a new publicly dataset for Human Activity Recognition using smartphones and acknowledged some results using a multiclass Support Vector Machine approach. They also improved the classification performance of the learned model using the dataset[1].

In the paper, the research team developed a complete system that included data acquisition system, features extraction, data processing, training and human activity recognition. Support vector machine is used to classify and identify action and recognise the system on windows, android platforms and operate in real time[2].

In the paper, a database of more than 100 subjects was analyzed regarding human activity recognition using smartphone sensors. They obtained 98% accuracy through evaluating performance in terms of confusion matrices, effects of time-window sizes and different feature vectors. In future, they plan to detect other complex activities to observe how the recognition rates scale for such sequences. Moreover, they expect to utilize their results for automatic social networking feeds, health related issues, calculating daily calories along with entertainment, sports, daily tasks or occupational tasks[3].

In the paper, the research group introduced a comprehensive survey of the recent advances in activity recognition with smartphone sensors. They reviewed the core data mining techniques behind the mainstream activity recognition algorithms, analysed their major challenges and introduced a variety of real application enabled by the activity recognition[4].



## Future works:

Our future plan is to expand our research accommodating certain features to monitor elder person's activity. Elder citizens age from 55-85 or even more need a routined monitoring all the time. Every activity such as sleeping hour, time spend in washroom, movements during sleep should be monitored to ensure whether they are healthy or not. If something abnormal in their activity is detected, we will assume that they are sick and they need medical supervision. In our country senior citizens need special care, specially who live in the oldage homes without their family. So in near future, we will try to observe elder person's activity and detect whether their activities are normal or abnormal.

## References:

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