

# HUMAN ACTIVITY ACKNOWLEDGEMENT USING MACHINE LEARNING SUPPORT VECTOR MACHINE AND ARTIFICIAL NEURAL NETWORKS

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## ABSTRACT:

Human activity recognition requires to predict the action of a person based on sensor generated data. It has attracted major interest in the past few years, thanks to the large number of applications enabled by modern ubiquitous computing devices. It classify data into activity like Walking, walking up stairs, walking down stairs, sitting, standing, laying are recognized. Sensor data generated using its accelerometer and gyroscope, the sensor signals (accelerometer and gyroscope) were pre-processed by applying noise filters. The sensor acceleration signal, which has gravitational and body motion components, was separated using a Butterworth low-pass filter into body acceleration and gravity. The gravitational force is assumed to have only low frequency components. a vector of features was obtained by calculating variables from the time and frequency domain. The aim is to predict machine learning based techniques for Human Activity Recognition results in best accuracy. The analysis of dataset by supervised machine learning technique(SMLT) to capture several information's like, variable identification, uni-variate analysis, bi-variate and multi-variate analysis, missing value treatments and analyze the data validation, data cleaning/preparing and data visualization will be done on the entire given dataset. To propose a machine learning-based method to accurately predict the stock price Index value by prediction results in the form of stock price increase or stable state

best accuracy from comparing supervise classification machine learning algorithms..

**Keywords:** *Machine Learning, Human Activities, Support Vector Machine(SVM), Artificial Neural Networks(ANN).*

### **INTRODUCTION:**

Human Activity Recanalization or HAR for short, is the problem of predicting what a person is doing based on a trace of their movement using sensors. Movements are often normal indoor activities such as standing, sitting, jumping, and going up stairs. Sensors are often located on the subject such as a smartphone or vest and often record accelerometer data in three dimensions (x, y, z). The idea is that once the subject's activity is recognized and known, an intelligent computer system can then offer assistance. It is a challenging problem because there is no clear analytical way to relate the sensor data to specific actions in a general way. It is technically challenging because of the large volume of sensor data collected (e.g. tens or hundreds of observations per second) and the classical use of hand crafted features and heuristics from this data in developing predictive models. More recently, deep learning methods have been achieving success on HAR problems given their ability to automatically learn higher-order features.. Data science is an interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from structured and The term "data science" has been traced back to 1974, when Peter Naur proposed it as an alternative name for computer science. In 1996, the International Federation of Classification Societies became the first conference to specifically feature data science as a topic. However, the definition was still in flux. The term —data sciencell was first coined in 2008 by D.J. Patil, and Jeff Hammerbacher, the pioneer leads of data and analytics efforts at LinkedIn and Facebook. In less than a decade, it has become one of the hottest and most trending professions in the market. Data science is the field of study that combines domain expertise, programming skills, and knowledge of mathematics and statistics to extract meaningful insights from data. Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing,speech recognition and machine vision. AI applications include advanced web search engines, recommendation systems (used by Youtube, Amazon and Netflix), Understanding human speech (such as Siri or Alexa), self-driving cars (e.g.

Tesla), and competing at the highest level in strategic game systems (such as chess and Go), As machines become increasingly capable, tasks considered to require "intelligence" are often removed from the definition of AI, a phenomenon known as the AI effect. For instance, optical character recognition is frequently excluded from things considered to be AI, having become a routine technology.

### **LITERATURE SURVEY**

Artificial intelligence was founded as an academic discipline in 1956, and in the years since has experienced several waves of optimism, followed by disappointment and the loss of funding (known as an "AI winter"), followed by new approaches, success and renewed funding. AI research has tried and discarded many different approaches during its lifetime, including simulating the brain, modeling human problem solving, formal logic, large databases of knowledge and imitating animal behavior. In the first decades of the 21st century, highly mathematical statistical machine learning has dominated the field, and this technique has proved highly. Machine learning is to predict the future from past data. Machine learning (ML) is a type of artificial intelligence (AI) that provides computers with the ability to learn without being explicitly programmed. Machine learning focuses on the development of Computer Programs that can change when exposed to new data and the basics of Machine Learning, implementation of a simple machine learning algorithm using python. Process of training and prediction involves use of specialized algorithms. It feed the training data to an algorithm, and the algorithm uses this training data to give predictions on a new test data. Machine learning can be roughly separated in to three categories. There are supervised learning, unsupervised learning and reinforcement learning. Supervised learning program is both given the input data and the corresponding labeling to learn data has to be labeled by a human being beforehand. Unsupervised learning is no labels. It provided to the learning algorithm. This algorithm has to figure out the clustering of the input data. Finally, Reinforcement learning dynamically interacts with its environment and it receives positive or negative feedback to improve its performance. Data scientists use many different kinds of machine learning algorithms to discover patterns in python that lead to actionable insights. At a high level, these different algorithms can be classified into two groups based on the way they —learn about data to make predictions: supervised and unsupervised learning. Classification is the process of

predicting the class of given data points. Classes are sometimes called as targets/ labels or categories. Classification predictive modeling is the task of approximating a mapping function from input variables( $X$ ) to discrete output variables( $y$ ). In machine learning and statistics, classification is a supervised learning approach in which the computer program learns from the data input given to it and then uses this learning to classify new observation. This data set may simply be bi-class (like identifying whether the person is male or female or that the mail is spam or non-spam) or it may be multi-class too. Some examples of classification problems are: speech recognition, handwriting recognition, bio metric identification, document classification etc

## METHODOLOGY



Figure1: Machine Learning Flow

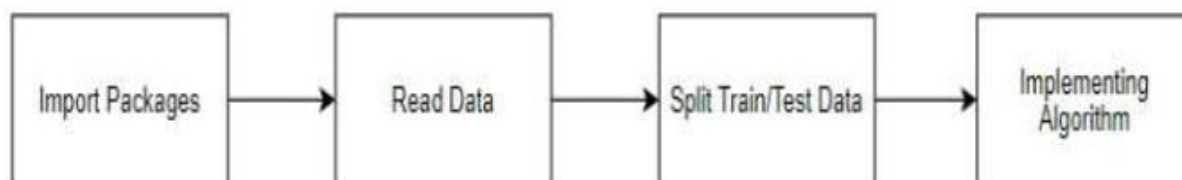


Figure2: Proposed Implementation

The goal is to develop a machine learning model for real-time Human activity recognition, to potentially replace the updatable supervised machine learning classification models by predicting results in the form of best accuracy by comparing supervised algorithm. Recognizing human activities from video sequences or still images is a challenging task due to problems, such as background clutter, partial occlusion, changes in scale, view point, lighting, and appearance. Many applications, including video surveillance systems,

human-computer interaction, and robotics for human behavior characterization, require a multiple activity recognition system. In this work, we provide a detailed review of recent and state-of-the-art research advances in the field of human activity classification. We propose a categorization of human activity methodologies and discuss their advantages and limitations. In particular, we divide human activity classification methods into two large categories according to whether they use data from different modalities or not. Then each of these categories is further analyzed into sub-categories, which reflect how they model human activities and what type of activities they are interested in. Moreover, we provide a comprehensive analysis. This paper provides a comprehensive survey for activity recognition in video surveillance. It starts with a description of simple and complex human activity, and various applications. The applications of activity recognition are manifold, ranging from visual surveillance through content based retrieval to human computer interaction. The organization of this paper covers all aspects of the general framework of human activity recognition. Then it summarizes and categorizes recent-published research progresses under a general framework. detection of a shadow, self-occlusion, and complete occlusion. Fast and accurate methods are still needed for segmentation techniques to affect the performance of latter stages. Description based approaches are doing well to recognize high level activities whose sub events are organized concurrently and occurring in a sequential manner in comparison to the statistical or syntactic approaches. The statistical and syntactic approaches can effectively handle the activity video polluted with noise. Detecting human beings accurately in a visual surveillance system is crucial for diverse application areas including abnormal event detection, human gait characterization, congestion analysis, person identification, gender classification and fall detection for elderly people. The first step of the detection process is to detect an object which is in motion. Object detection could be performed using background subtraction, optical flow and spatio-temporal filtering techniques. Once detected, a moving object could be classified as a human being using shape-based, texture-based or motionbased features. A comprehensive review with comparisons on available techniques for detecting human beings in surveillance videos is presented in this paper. At the end of this paper, a discussion is made to point the future work needed to improve the human detection process in surveillance videos. These include exploiting a multi-view

approach and adopting an improved model based on localized parts of the image.

## RESULTS AND DISCUSSION

Decision Tree, Random Forest, Simple Linear Regression and multinomial regression are the classification method used for time series predict in this research work. Two group are separated from the data set for training and for testing the algorithms of classification. To execute the classification algorithms, the tool used is flask webapp data examination. For classification procedure no more than a separation of data is particular from the loaded data. To choose a subset from innovative data, “Select attribute” are utilised by the operative. The preferred subset is then subjected to “X-Validation” operator. It develop the classification representation which is validated by the test data.

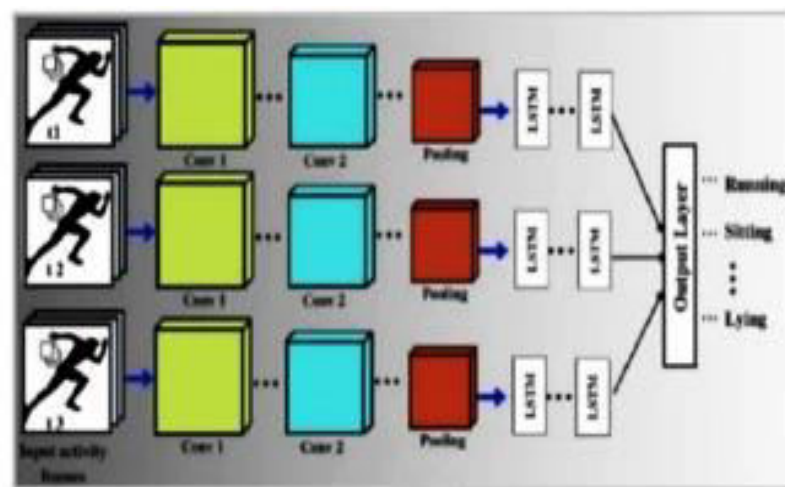


Figure3: Implementation SVM

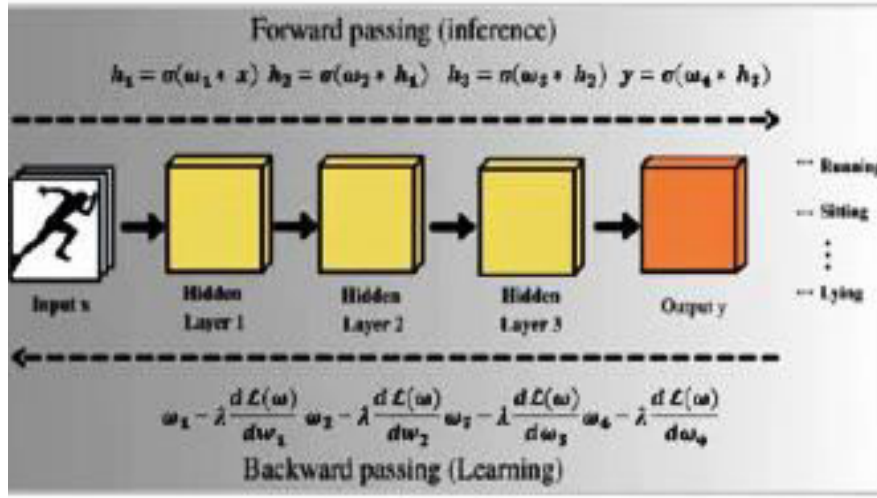


Figure4: Implementation Proposed ANN

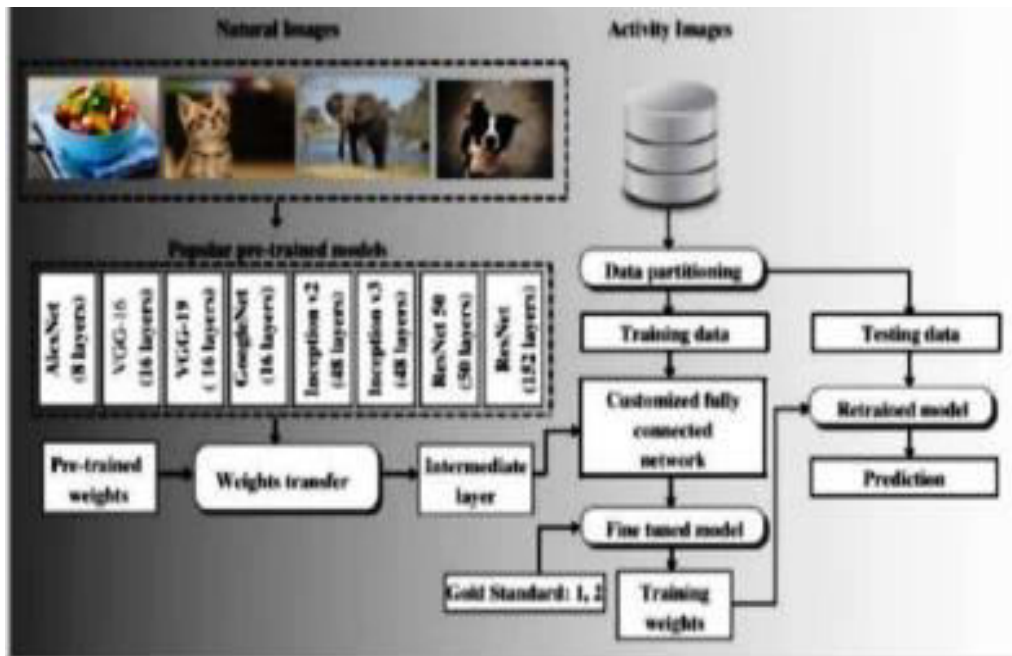


Figure5: Processing the System

**CONCLUSION**

The analytical process started from data cleaning and processing, missing value, exploratory analysis and finally model building and evaluation. The best accuracy on public test set is higher accuracy score is will be find out. This application can help to find the Human Activity Based on the Smartphone sensor. Human Activity Recognition

connect with AI model. To automate this process by show the prediction result in web application or desktop application. To optimize the work to implement in Artificial Intelligence environment.

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