# Recognition and Identification of Human Activity

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**Abstract -** Human activity apperception plays a paramount role in human-to-human interaction and interpersonal cognitions. Because it provides information about the identity of a person, their personality, and psychological state, it is arduous to extract. The human competency to analyze another person's activities is one of the main subjects of study in the scientific areas of computer vision and machine learning. As a result of this research, many applications, including video surveillance systems, human-computer interaction, and robotics for human comportment characterization, require multiple activity apperception systems.

**Keyword - HAR, Machine Learning, OpenCV, Haar Cascade, CNN.**

## I. INTRODUCTION

To apperceive, detect and relegate the activity of humans many applications have been developed with human-centered monitoring and researchers have proposed different solutions. Human activity apperception is one of the paramount technology to monitor the dynamism of a person and this can be procured with the fortification of Machine learning techniques. The threshold-predicated algorithm is simpler and more expeditious and is often applied to agnize human activity. But Machine algorithm provides the reliable result. Numerous sensors have been deployed to optically canvass the human dynamic characteristics. This paper intends to quantify the efficacy of sundry machine learning relegation algorithms. Low cost and commercial web cams are utilized as sensors to record the activities of humans. Different studies have been conducted in the perspicacious environment to optically canvass the activities of humans. We developed AI Models for "Human Activity Apperception". The motivation abaft our work is to implement machine learning algorithms in genuine-world datasets so that their precision can be studied and efficacious conclusions can be drawn.

## II. LITERATURE REVIEW

Zameer Gulzar, et al. [1] smartphones have been playing a consequential role in identifying human activities and have become a popular field of research. This paper gives a detailed overview of sundry research papers on identifying human activity. Artificial Perspicacity models have been developed to identify the activities of Humans in the provided UCI online storehouse. The information they culled is multivariate and we have implemented sundry machine taxonomic mechanisms desultory forest, KNN, neural network, Logistic regression, stochastic gradient descent, and naïve Beige for analyzing human activity. In addition to engendering AI models, the size of the dataset is abbreviated by the feature cull process. Precision and recall values were calculated and a Discombobulation matrix was engendered for each model. The results of the experiment Proved to provide neural network and logistic regression More precise to identify human activity than other Classifiers such as k-Neighbor (KNN), SGD, and Arbitrary Forrest.

Davide Anguita, et al. [2] the purport of activity-predicated computing is to capture the utilizer's position and the environment by exploiting heterogeneous sensors to optimize exogenous computing resources. When these sensors are affixed to the body of the subject, they sanction perpetual monitoring of numerous physical signals. It has alluring uses in healthcare applications, e.g. Exploitation of the circumventing astuteness (AmI) in daily activity monitoring for the elderly. In this paper, we present a system for human physical activity identification (AR) utilizing smartphone inertial sensors. Since these mobile phones are circumscribed in terms of energy and computing puissance, we propose an incipient hardware-amicable approach to multiclass relegation. This method converts standard support vector machines (SVMs) and uses fine-tuned-point arithmetic to

minimize computational costs. Comparisons with traditional SVMs show paramount amendments in computer costs while maintaining the same precision, which can contribute to the development of more sustainable systems for AMI.

Juha Vesanto, et al. [3] Self-Organizing Map (SOM) is an efficient implementation for visualizing multi-dimensional numerical data. In this paper, an overview and relegation of both old and incipient methods for visualization of SOM are presented. The purport is to provide a conception of what kind of information can be gleaned from different presentations and how SOM can best be utilized in exploratory data visualization. Most of the methods presented can withal be applied in the more general case of first making vector quantization (e.g. K-denotes) and then vector projection (e.g. mapping of salmon).

Jiang, L, el at. [4] Since learning the optimal Bayesian network classifier is an NP-conundrum, the cognition-enhanced ingenuous Bayes has magnetized an abundance of researchers' attention. In this paper, we summarize the current modified algorithm and propose a novel Bayes model: obnubilated verdant Bayes (HNB). Experimental results show that HNB has performed significantly better than NB, SBC, NBTree, TAN, and AODE. In most data mining applications, precise class probability estimates and rankings are additionally desirable. We study the class probability estimation and sorting performance, the area under conditional log probability (CLL) and ROC curve (AUC), respectively, the ingenuous base and its modified models, such as SBC, NBTree, TAN, and AODE, and then CLL and AUC with them. Compare HNB with deference to our experiments show that HNB withal performs the most consequential of all.

Ong Chin Ann et al. [5] Human activity apperception is one of the most active research areas in computer vision for sundry contexts such as safety monitoring, health care, and human-computer interface. This paper reviews a total of thirty-two recent research papers on sensing technologies utilized in HAR. The review work with three areas of sensing techniques such as RGB cameras, depth sensors, and wearable contrivances. It additionally discusses the advantages and disadvantages of the mentioned sensing technologies. The outcomes show that RGB cameras are less popular than depth sensors and wearable contrivances in HAR research.

Ms. Shikha et al. [6] subject of Human Activity Apperception (HAR) is a major research area in the field of computer vision and image processing. It has enabled state-of-the-art applications in many areas, including surveillance, digital regalement, and medical healthcare. Visually examining is fascinating and it is fascinating to prognosticate such forms of kineticism. Accelerometer, gyroscope, etc. A number of sensor-predicated methods have withal been introduced to study and prognosticate kindred human activities, with their own advantages and disadvantages.

## III. METHODOLOGY

### Data Collection Model

Machine learning is the incipient sizably voluminous thing in the world of computer science. The motivation abaft this project is to implement machine learning algorithms in genuine-world data sets so that their precision can be studied and efficacious conclusions can be drawn. In this project a self made dataset is being used for the prediction of activities. A real time video was implemented to classify and identify the activity being performed.

Random Forest Algorithm

Desultory Forest works for both relegation and regression tasks. Arbitrary forests form a plethora of cull trees. Each tree is engendered from a bootstrap test from the preparation information. Determine what number of cull trees will be incorporated into the woodland (Number of trees in the timberland), and what number of characteristics will be self-assertively drawn for noetic conception at every hub. In the event that the last isn't designated (cull Number of properties… left unchecked), this number is identically tantamount to the square base of the number of traits in the information. Unique Breiman's proposition is to

develop the trees with no pre-pruning, however since pre-pruning customarily works great and is more expeditious, the client can set the profundity to which the trees will be developed.

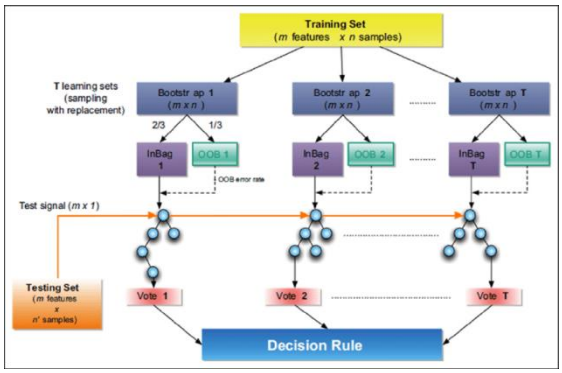


**Fig. 1 Random Forest Algorithm Work Flow**

## CNN Algorithm

Convolutional Neural Networks withal kenned as CNNs or ConvNets, are a type of victual-forward artificial neural network whose connectivity structure is inspired by the organization of the animal visual cortex. Diminutive clusters of cells in the visual cortex are sensitive to certain areas of the visual field. Individual neuronal cells in the encephalon respond or fire only when certain orientations of edges are present.

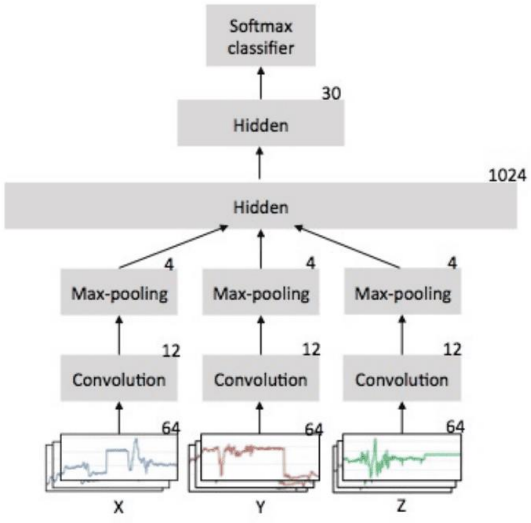


**Fig. 2 CNN algorithm Classification Working**

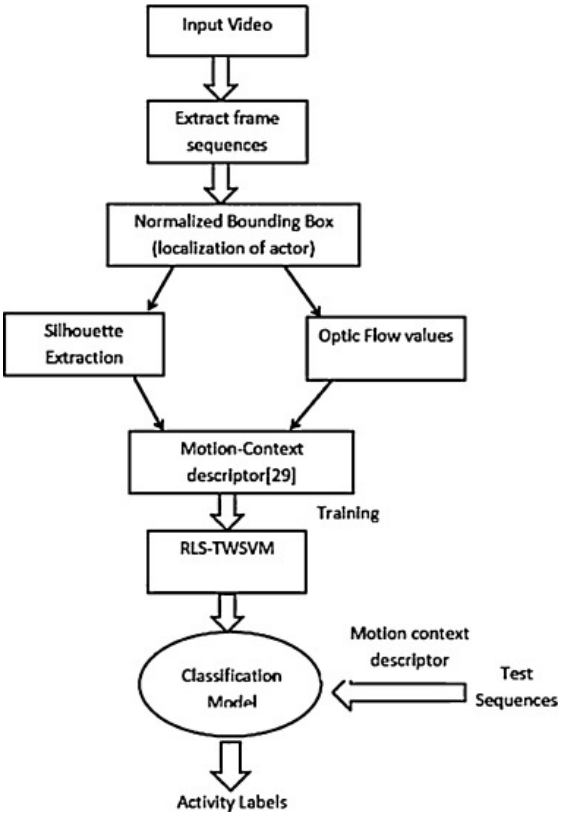


**Fig. 3 CNN Working Flow**

Human activity analysis is a popular activity in the growing industry and we have applied different machine learning algorithms. A comparative study was performed among the applied sundry techniques kNN, SVM, Desultory Forest, Neural Networks, Logistic regression, and Naïve Bayes. In them, Logistic Regression and the neural network gave good results whereas Ingenuous Bayes's result was not good. The implementation of Neural Network on Python gave bettel results than the one provided in the Orange implement. The inhibition of this work is though the efficiency of the neural network is good, the model is not dynamic. The inability of getting trained with genuine-time data will coerce us to train the model every time incipient data comes. In the future, these results can be utilized for making smartwatches and kindred contrivances that can track a user's activity and notify him/her of the quotidian activity log. They can additionally be utilized for monitoring elderly people, prison inmates, or anyone who requires constant supervision.

## IV. RESULTS

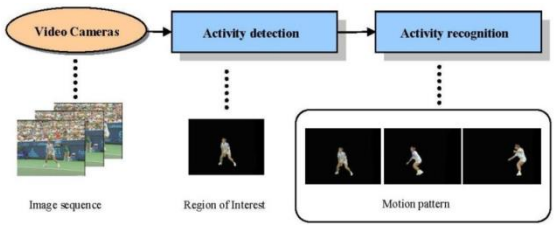


**Fig. 4 Human Activity Recognition**

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