



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 10, Issue 4, April 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.165



9940 572 462



6381 907 438



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Human Action Recognition System Using Machine Learning

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ABSTRACT: Human Activity recognition exhibits its presence in diverse research areas like medical organization, Survey system, security surveillance as well as human computer interaction. This work demonstrates a robust approach of classifying four basic human centred behaviours (Walking, Sitting, Standing, and Hand Waving) implementing Using Logistic Regression, Linear Regression, CV and Random Forest algorithm. Computing is an up-and-coming research to comprehend individual actions and try to assimilate their social context. A precise demanding and agreeable application of sensing human body motion by smart phones to collect context information. Here, activity recognition database is considered publicly available as repository.

Human activity detection for video system is an automated way of processing video sequence and making an intelligent decision about the actions in the video. The project is about real-time system for human detection, tracking and motion analysis. This system has an video system for detecting and monitoring action of people in both indoor and outdoor environments. Human detection has always been a challenging problem as human bodies are non-rigid and changes shape arbitrarily. Image is considered to find Humans in it by using algorithms CNN and Linear Regression. Pose classification and a moving object could be classified as a human being using MediaPipe, followed by human modeling to recognize and monitor human activity in the scene such as human walking, standing, sitting.

KEY-WORD:-KNN, LOGISTIC REGRESSION, LINEAR REGRESSION .

I. INTRODUCTION

Human motion tracking system is focused on people counting and tracking mainly for realtime applications such as security system, traffic monitoring, etc. The human is detected from the live video and tracked using MediaPipe and linear Regression, this system is proposed for real-time security purpose. Modern systems and research based on computer vision have proved that the computers can be made capable enough to sense the scene and react accordingly if the machine vision is compared to human vision, undoubtedly human eye can collect the scene information at a very high speed and transfer that to the brain for processing. Data gathered in video surveillance requires continuous monitoring which increases the monetary and human load of a system. Human motion detection system helps to identify the motion of the human and send the image of the motion to the user. This helps in monitoring motion in nearby areas by sensing sensitivity of the area and as soon as sensitivity reaches desired limit the system knows that a motion has taken place. Continuous monitoring of the surrounding for sensitivity is a must in this system. Human motion tracking systems produce huge amounts of data for storage and display.

Long-term human monitoring of the acquired video is impractical and ineffective. Automated video surveillance system addresses real-time observation of people within a busy environment leading to the description of their actions and interactions. Human detection is very helpful as it will help to identify the person which helps to enhance security as it will be easy to nab a intruder in case of a theft by detecting the face.

II. MOTIVATION

The aims of Human Action Recognition is to appreciate individual activities with their social perspective. Importantly the classification performance of the learned model using new data set as compared to the previous one, with reduced set of features and improved results, dynamic activities can also be efficiently classified on released data set, non dynamic actions still there classification overlaps.

The main goal of human activity detection system is to examine the activity of human from the real time video. Motivating by this fact, Human activity detection system classify the input data into it's provided category of activity.

III. PROBLEM DEFINATION

Recently to detect and identify human Activity is so difficult. So, we are going to implement an proposed model for a Logistic Regression (LR) Perception Network on image processing.

IV. SYSTEM ARCHITECTURE

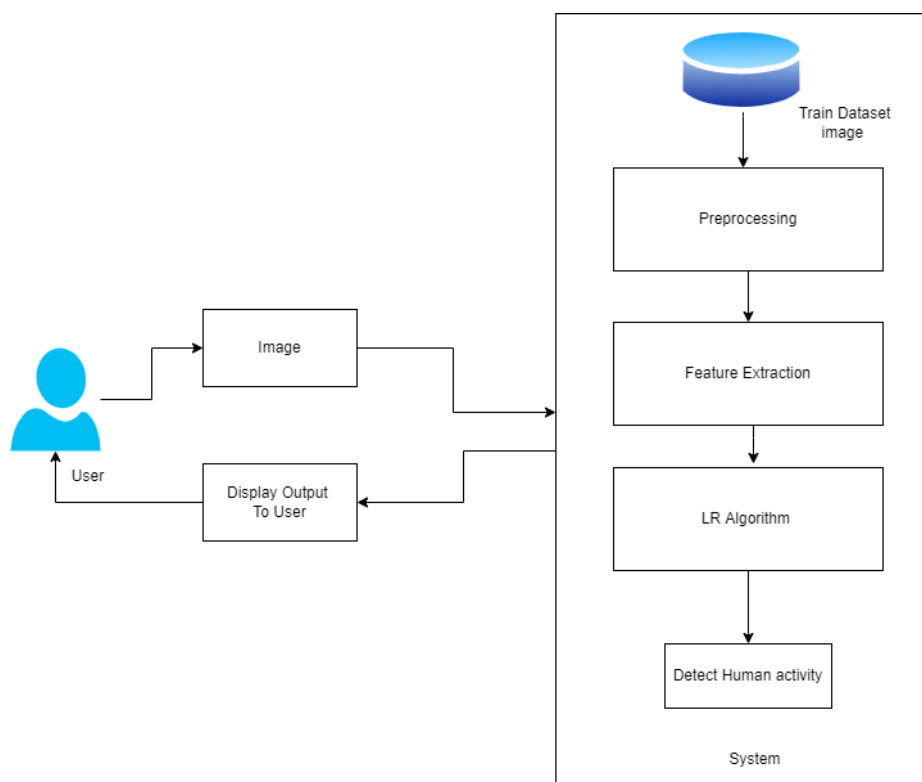


Fig 1. System Architecture

V. DATA FLOW DIAGRAM

In Data Flow Diagram we Show that glide of information in our machine in DFD0 we show that base DFD in which rectangle current enter as well as output and circle show our system, In DFD1 we show real enter and genuine output of device enter of our system is text or image and output is rumor detected like smart in DFD two we present operation of person as nicely as admin.



Fig 2. Data Flow Diagram

VI. UML Diagram

Unified Modelling Language is a trendy language for writing software blueprints. The UML might also be used to visualize, specify, construct and document the artifacts of a software intensive system. UML is system independent, although optimally it need to be used in method that is use case driven, architecture-centric, iterative, and incremental. The Number of UML Diagram is available.

- Use case Diagram.
- Activity Diagram.
- Sequence Diagram.
- Component Diagram.

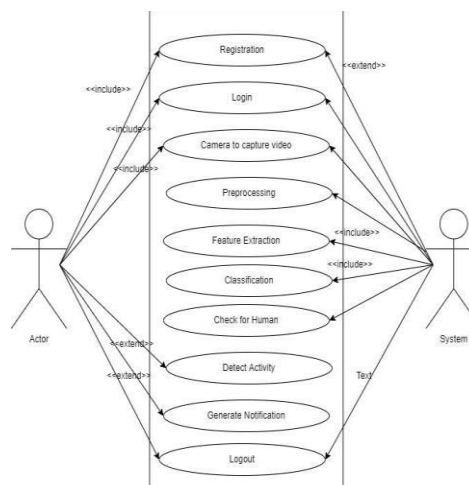


Fig3. Use Case Diagram

VII. ACTIVITY DIAGRAM

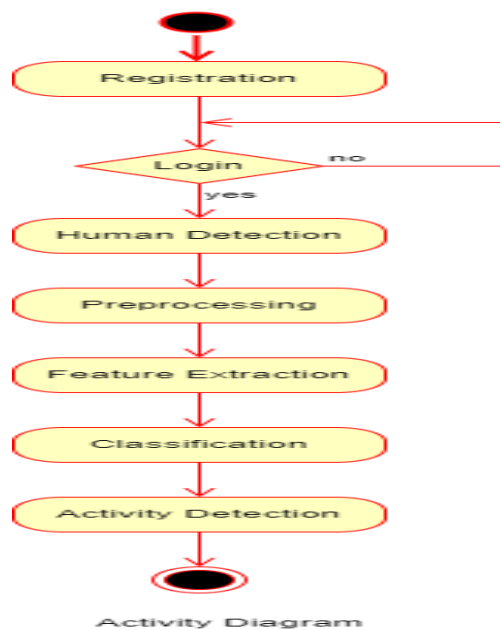


Fig4. Activity Diagram

VIII. ALGORITHMM

Linear Regression:

“Linear Regression” is a supervised computer gaining knowledge of algorithm that can be used for each classification or regression challenges. However, it is mostly used in classification problems. Linear Regression is a linear approach for modelling the relationship between a scalar response and one or more explanatory variables (also known as dependant and independent variable). The case of one explanatory variable is called **simple linear regression**; for more than one, the process is called **multiple linear regression**. This term is distinct from multivariate linear regression, where multiple correlated dependent variables are predicted, rather than a single scalar variable.

In linear regression, we plot the graph between the variable which best fit the given data points. Linear regression shows the linear relationship Fig 2. Data Flow Diagram between the dependant variable (y-axis) independent variable (x-axis). To calculate the best-fit line linear regression uses the traditional slope-intercept form.

Mathematical Module:

•**Input:-** Array of data points(x,y)

•**Output:-** line $y = a + bx$

•**Method:-**

•**Traditional:-** Compute a and b by minimizing,

$$\sum_{i=1}^n ((y_i - a - bx_i))^2$$

•Let error1 be the computed traditional error value.

•

•**New:-** Compute a and b, by minimizing

$$\sum_{i=1}^n ((y_i - a - bx_i)^2) / \sqrt{(1 + b^2)}$$

•Let the error2 be the computed PCA adapted error value.

•Compared error1 and error2

•where,

•a — represents the intercept

•b — represents the coefficient

•x — represents the independent variable

•y — represents the output or the dependent variable

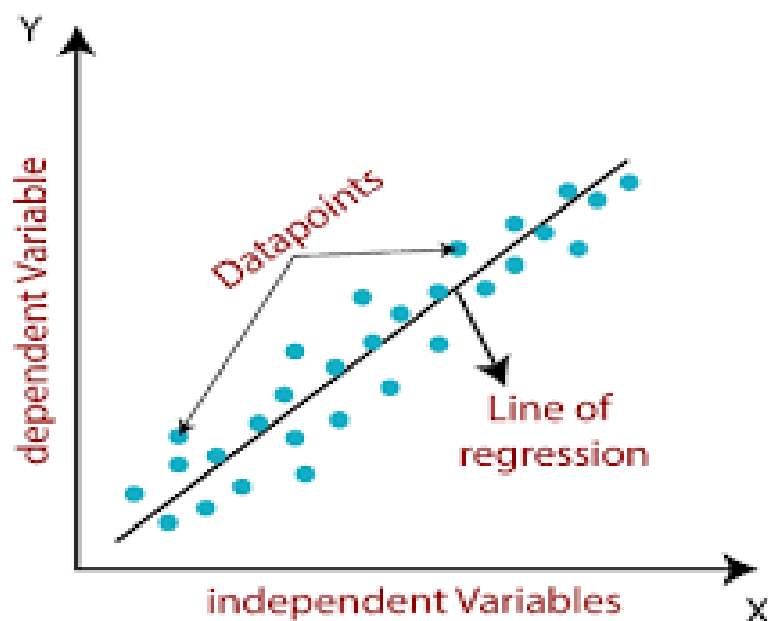


Fig5. Linear Regression Graph

MediaPipe:

- STEP-1:** Import all the necessary libraries, In our case only two libraries are required.
- STEP-2:** Initializing Holistic model and Drawing utils for detecting and drawing landmarks on the image.
- STEP-3:** Detecting Face and Hand landmarks from the image. Holistic model processes the image and produces landmarks for Face, Left Hand, Right Hand and also detects the Pose.

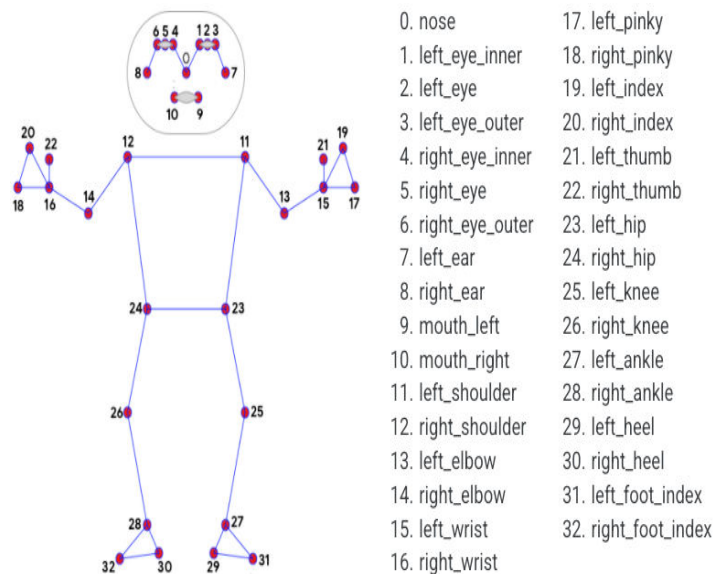


Fig 6. Holistic Model

IX. SOFTWARE INFORMATION

Python

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level constructed in records structures, mixed with dynamic typing and dynamic binding, make it very pleasing for Rapid Application Development, as properly as for use as a scripting or glue language to connect present components together. Python’s simple, easy to analyze syntax emphasizes ability and therefore reduces the fee of program maintenance. Python supports modules and packages, which encourages software modularity and code reuse. The Python interpreter and the considerable popular library are reachable in source or binary form without charge for all important platforms, and can be freely distributed

Anaconda Navigator :

Anaconda Navigator is a computing device graphical user interface (GUI) included in Anaconda distribution that permits you to launch applications and without problems manipulate conda packages, environments, and channels except using command-line commands. Navigator can search for programs on Anaconda.org or in a neighbourhood Anaconda Repository. It is available for Windows, macOS, and Linux.

Spyder :

Spyder is short for ”Scientific Python Development Environment.” It’s supposed for use as a workbench for scientific computing with Python, and that’s mirrored in the feature set, the packaging, and the typical conduct of the IDE. Spyder has useful features for common Python development, however unless you work more often than not with Python and scientific computing packages, you’re in all likelihood better off with a exceptional IDE. The largest cause now not to use. Spyder as a general-purpose Python development environment isn’t the feature set, however the setup process. Spyder is now not delivered as a standalone executable in the manner of a product like Visual Studio or

PyCharm. Instead, it's set up as a Python package. Your easiest route to Spyder is to install a Python distribution that comes with it preloaded, such as Continuum Analytics' s Anaconda.

DBSqlite 3:

DB Browser for SQLite (DB4S) is a excessive quality, visual, open supply tool to create, design, and edit database archives well suited with SQLite. DB4S is for users and developers who choose to create, search, and edit databases. DB4S makes use of a acquainted spreadsheet-like interface, and difficult SQL commands do not have to be learned. Controls and wizards are accessible for customers to:

- Create and compact database files
- Create, define, adjust and delete tables
- Create, define, and delete indexes
- Browse, edit, add, and delete records
- Search records
- Import and export files as text
- Import and export tables from/to CSV files
- Import and export databases from/to SQL dump files
- Issue SQL queries and inspect the results
- Examine a log of all SQL instructions issued via the application
- Plot easy graphs based on table or question information

Software Testing :

Testing is an investigation performed to furnish stakeholders with data about the great of the product or service beneath test. Software checking out also provides an objective, unbiased view of the software to enable the enterprise to recognize and understand the risks of software program implementation. Test strategies include, but are not limited to, the technique of executing a software or utility with the intent of finding software bugs. Software trying out can also be cited as the manner of validating and verifying that a software program or utility or product:

1. Meets the business and technical requirements that guided
2. Works as expected;
3. Can be applied with the same characteristics

Types of Testing :

Unit Testing :

It focuses on smallest unit of software program design. In this we test an character unit or group of inter related units.

Regression Testing :

The goal is to take unit examined elements and construct a software shape that has been dictated by design. Integration checking out is testing in which a crew of components are blended to produce output.

Smoke Testing :

Very time new module is brought leads to modifications in program. This kind of testing make sure that complete thing works precise even after adding aspects to the whole program.

System Testing :

In this software program is tested such that it works pleasant for extraordinary running system. It is covered under the black box testing technique.

X. CONCLUSION AND FUTURE FRAMEWORK

We propose a Machine learning approach to detect the real-world Human Activity identification in videos. This Human Motion Tracking System help us to determine the action of human. This system can be use to enhance the security and safety of people and provide assistance immediately whenever any suspicious activity detected before any further harm occurs. The model was trained to recognise four human activities as normal or suspicious. Real time human activity recognition is important to monitor the behaviour of people as seen in camera.

REFERENCES

1. Switching Structured Prediction for Simple and Complex Human Activity Recognition, IEEE Transactions on Cybernetics (Volume: 51, Issue: 12, Dec. 2021), 14 January 2020.
2. A Hybrid Approach for Human Activity Recognition with Support Vector Machine and 1D Convolutional Neural Network Md Maruf Hossain Shuvo; Nafis Ahmed; Koundinya Nouduri; Kannappan Palaniappan 2020 IEEE Applied Imagery Pattern Recognition Workshop (AIPR)
3. Real-time Human Activity Recognition Using ResNet and 3D Convolutional Neural Networks N. Archana; K. Hareesh 2021 2nd International Conference on Advances in Computing, Communication, Embedded and Secure Systems (ACCESS)
4. J. Wang, Y. Chen, S. Hao, X. Peng, and L. Hu, "Deep learning for sensor-based activity recognition: A survey," Pattern Recognition Letters, vol. 119, pp. 3-11, 2019.
5. <https://www.analyticsvidhya.com/blog/2017/09/common-machine-learning-algorithms/>
6. <https://www.geeksforgeeks.org/human-activity-recognition-using-deep-learning-mode>

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SJIF Scientific Journal Impact Factor

Impact Factor: 8.165

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