e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
( Peer-Reviewed, Open Access, Fully Refereed International Journal )
Volume:03/Issue:11/November-2021 Impact Factor- 6.752 www.irjmets.com

# PERSONAL ARTIFICIAL INTELLIGENCE TRAINER

**Neeraj Rajput[*1], Saurabhsingh Rajput[*2], Shravan Singh[*3], Aashna Rachh[*4], Ms. Sujata Oak[*5]**

[*1,3,4]Mumbai University, Information Technology, Ramrao Adik Institute Of Technology, Nerul, Maharashtra, India.

[*2]Mumbai University, Civil Engineering ,B.R Harne College Of Engineering, Thane, Maharashtra, India.

[*5]Department Of Information Technology Engineering, Ramrao Adik Institute Of Technology, Nerul, Maharashtra, India.

## ABSTRACT

Staying at home for extended periods of time can get tedious, especially when the majority of exciting activities take place outside. However, this is not an excuse to be inefficient, and the extra time available is a good opportunity to improve your own health. Gyms typically provide a selection of equipment and trainers who can instruct you on how to use it. The lack of these in one's house might frequently be the stumbling block to exercising. Wouldn't it be amazing if you could hire a personal trainer to come to your house and create workouts for you? What if it could also keep track of how many times you've done each exercise so you can focus all of your attention and energy on doing one more push up?

To get a sense of the type of engagement you may have with such an assistant, consider the hypothetical scenario below, in which you (still a stick figure, but soon a six-pack owner) are on the left and your personal AI trainer is on the right.

**Keywords:** Artificial Intelligence, Trainer.

## I. INTRODUCTION

Almost every business, including fitness, has been changed by technological advancements. Previously, gyms and fitness clubs were the only places where consumers could get a personal trainer to assist them achieve their goals. However, not everyone can afford to hire a personal trainer. That's when AI personal trainers entered the scene.

AI personal trainer is no longer a new word, with so many digital fitness programmers, combined with the digital coach, garnering unprecedented popularity. Let's start with an explanation of what an AI personal trainer is for people who don't know what it is or have never heard of it.

"AI personal trainers are artificial intelligence-powered virtual trainers who assist you in achieving your fitness goals. The computerized personal trainer may provide you with tailored training and diet regimens after gathering a few facts such as body measurements, current fitness level, fitness objectives, and more."

## II. METHODOLOGY

### 2.1 Proposed System

Using OpenCV and Python, we will create an AI Trainer in this project. We'll utilise the CPU's posture estimate to get the proper points, and we'll use these points to achieve the necessary angles. Then we identify a variety of movements depending on these angles, including the amount of biceps curls. We'll design the code in such a manner that you can determine angles between any three points with just one line of code.

### 2.2 Proposed Methodology

In 1999, Gary Bradsky founded OpenCV at Intel. While OpenCV supports a variety of languages, including C++, Python, and others, OpenCV-Python is an OpenCV API that combines the capability of Python with the OpenCV C++ API.

This is a Python bindings package aimed at solving computer vision challenges. NumPy is used in this library, and all array structures convert to and from NumPy arrays. This also implies it'll be simple to combine with other Python libraries like SciPy and Matplotlib (these make use of NumPy).

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
( Peer-Reviewed, Open Access, Fully Refereed International Journal )
Volume:03/Issue:11/November-2021 Impact Factor- 6.752 www.irjmets.com

**a. Using Python to install OpenCV**

Make sure you have Python and NumPy installed on your computer before installing OpenCV. So you don't end up in DLL Hell, you can get the wheel for OpenCV here (unofficially).

https://www.lfd.uci.edu/~gohlke/pythonlibs/#opencv

You can then use pip to install this file: pip install [path of wheel file]

**b. Importing OpenCV in Python**

Get to the IDLE and import OpenCV:

>>> import cv2

You can also check which version you have:

>>> cv2.__version__

Python Computer Vision — Working with Images

**c. Reading Images in Python**

The built-in function/method imread may be used to read a picture ().

>>> img=cv2.imread('py.jpg')

It's worth noting that we've already navigated to the image's directory.

To load a colour picture disregarding existing transparency, we may optionally give a value for a flag, which is the second argument- cv2.IMREAD COLOR (default flag)

To load a grayscale picture, use cv2.IMREAD GRAYSCALE.

To import an image with an alpha channel, use cv2.IMREAD UNCHANGED.

Integers 1, 0, and -1 can be sent.

>>> img=cv2.imread('py.jpg',0)

There is no error if you supply an invalid image path, however print(img) returns None.

Let's go through Python Data Structures again.

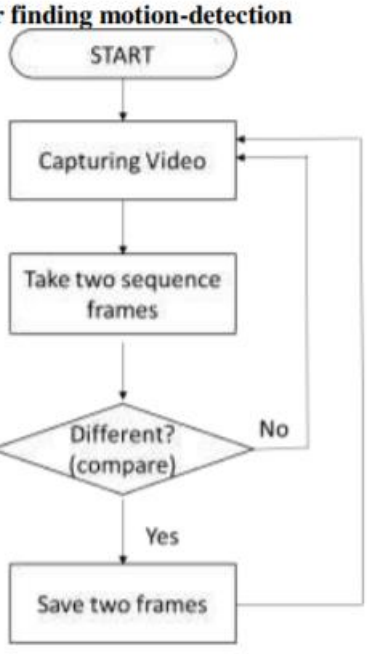
**d. Displaying Images in Python**

The function/method cv2.imshow() lets us display an image in a window which fits itself to the size of the image. The first argument is the window name- a string; the second is the image.

>>> img=cv2.imread('py.jpg')

>>> cv2.imshow('Python',img)

**Flow chart for finding motion-detection**



e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
( Peer-Reviewed, Open Access, Fully Refereed International Journal )
Volume:03/Issue:11/November-2021 Impact Factor- 6.752 www.irjmets.com

## III. MODELING AND ANALYSIS

We'll utilise the CPU's posture estimate to get the proper points, and we'll use these points to acquire the angles we want. Many motions, like the amount of biceps curls, are then discovered based on these angles. With only a single line of code, we'll be able to determine angles between any three locations.

**1.OpenCV**

OpenCV is a programming library geared mostly at real-time computer vision. It was created by Intel and then sponsored by Willow Garage and Itseez. Under the open-source BSD licence, the library is cross-platform and free to use.

**2.Python**

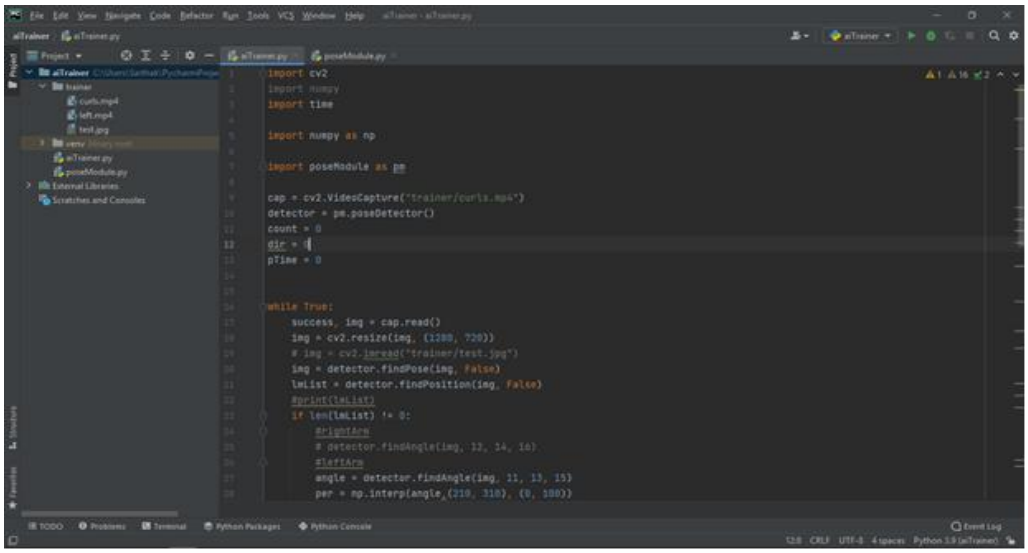
Python is a high-level, interpreted programming language that may be used for a variety of tasks. Python is garbage-collected and dynamically typed. It supports a variety of programming paradigms, including structured (especially procedural) programming, object-oriented programming, and functional programming. Python programming has a number of frameworks and capabilities that may be used in web application development, graphical user interfaces, data analysis, data visualisation, machine learning, and other areas. Although the Python programming language is not perfect for web application development, it is widely utilised by many businesses for assessing massive datasets, data visualisation, data analysis, and prototyping. Programming in Python programming language is gaining traction amongst users for data science whilst being outmoded as a web programming language.

**3.Artificial Intelligence**

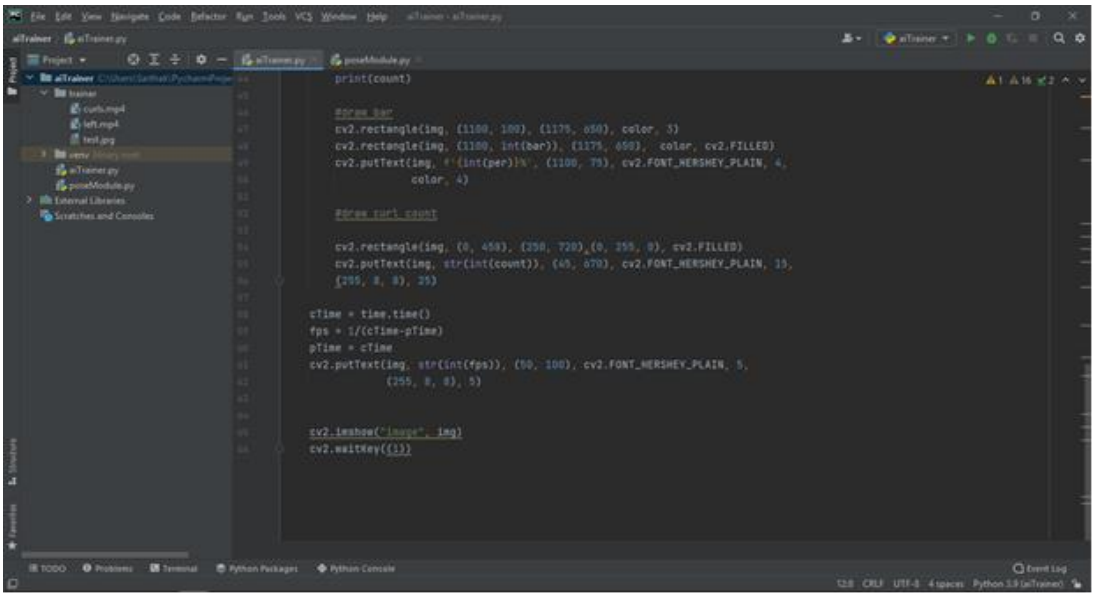
Artificial intelligence (AI) is a branch of computer science that focuses on the development of intelligent computers that function and behave similarly to humans. Artificial intelligence-enabled computers are capable of doing the following tasks: Speech recognition is a technology that allows you to 980ecognize what someone Learning.

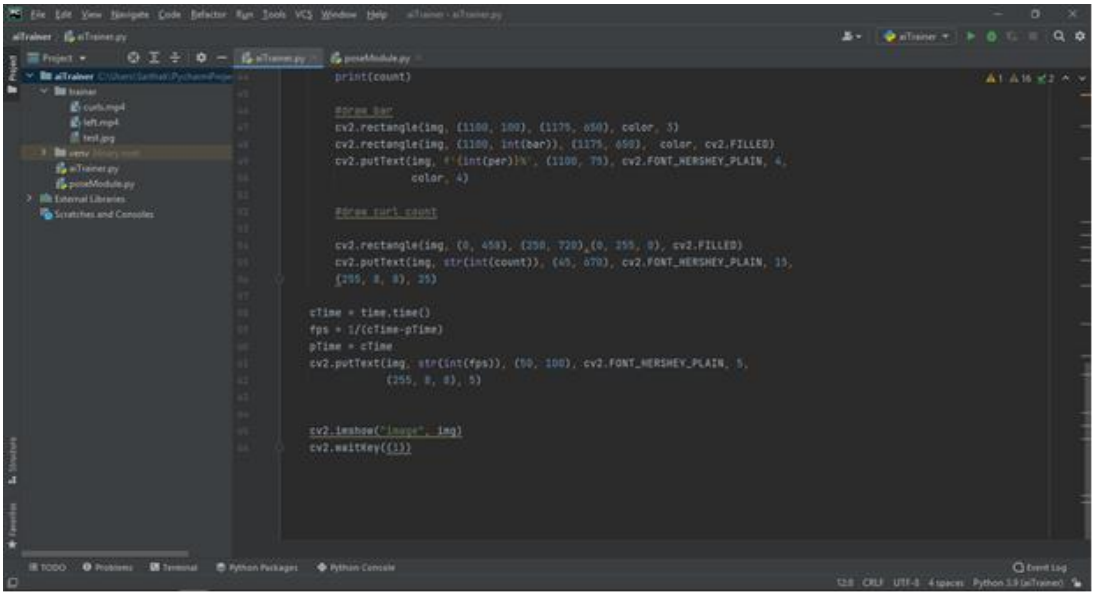
**4. MediaPipe**

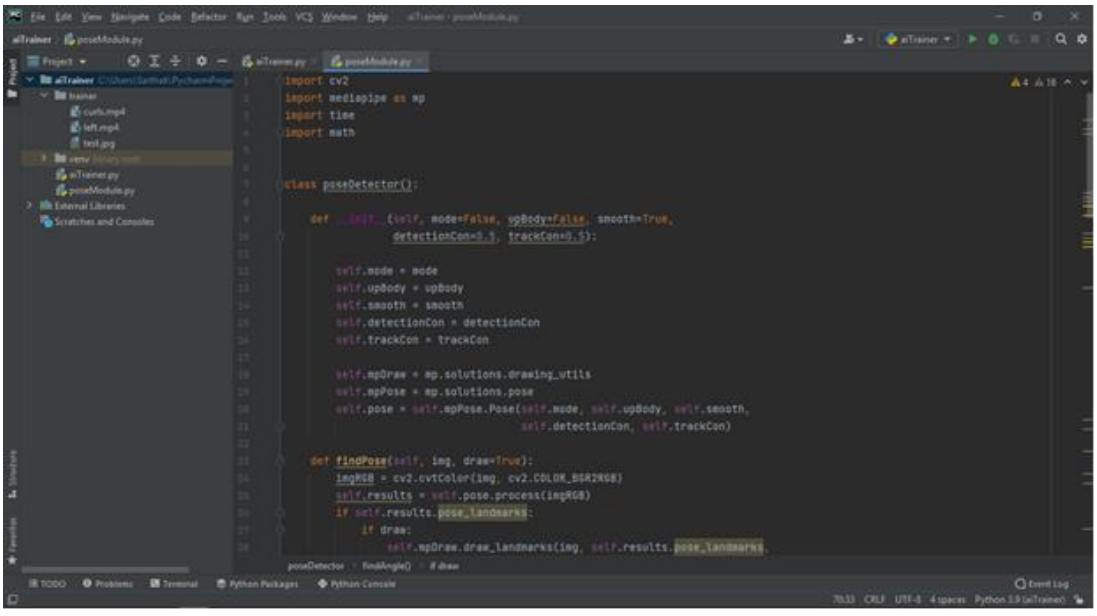
MediaPipe has made developing our 3D human pose reconstruction demo app relatively simple, allowing for faster neural network inference on the device and synchronisation of our result display with the video capture stream.



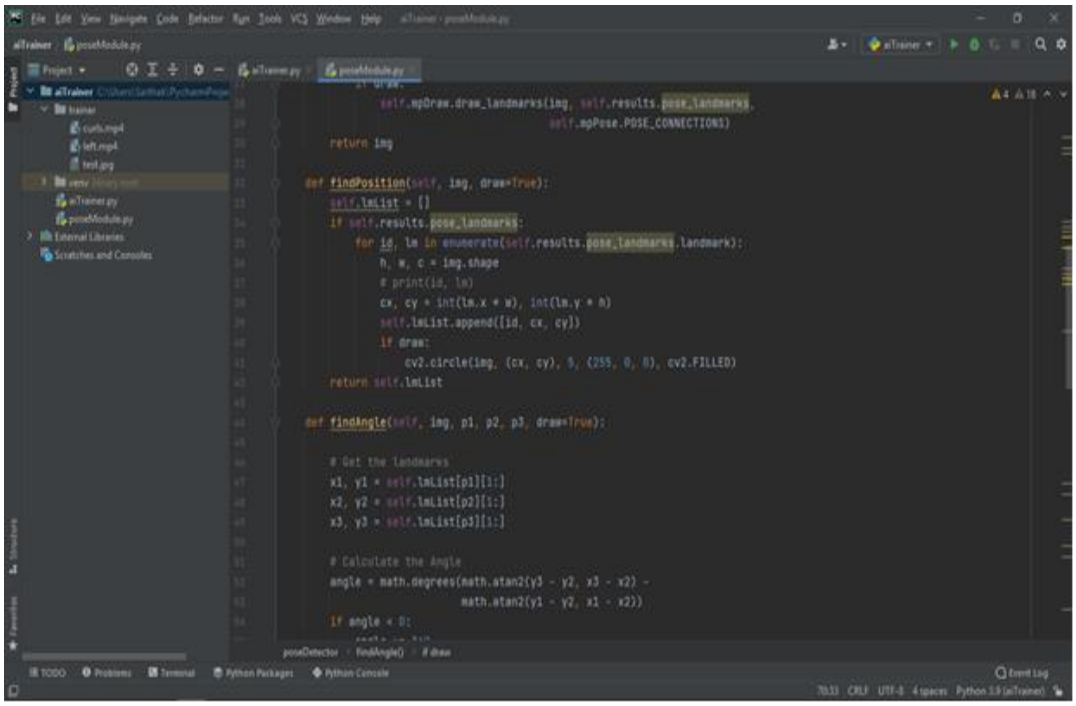
e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
( Peer-Reviewed, Open Access, Fully Refereed International Journal )
Volume:03/Issue:11/November-2021 Impact Factor- 6.752 www.irjmets.com







e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
( Peer-Reviewed, Open Access, Fully Refereed International Journal )
Volume:03/Issue:11/November-2021 Impact Factor- 6.752 www.irjmets.com



## IV. RESULTS AND DISCUSSION

**MediaPipe**

MediaPipe is a framework for building multimodal (eg. video, audio, any time series data), cross platform (i.e Android, iOS, web, edge devices) applied ML pipelines. With MediaPipe, a perception pipeline can be built as a graph of modular components, including, for instance, inference models (e.g., TensorFlow, TFLite) and media processing functions.

Cutting edge ML models

- Face Detection
- Multi-hand Tracking
- Hair Segmentation
- Object Detection and Tracking
- Object: 3D Object Detection and Tracking
- Auto Flip: Automatic video cropping pipeline

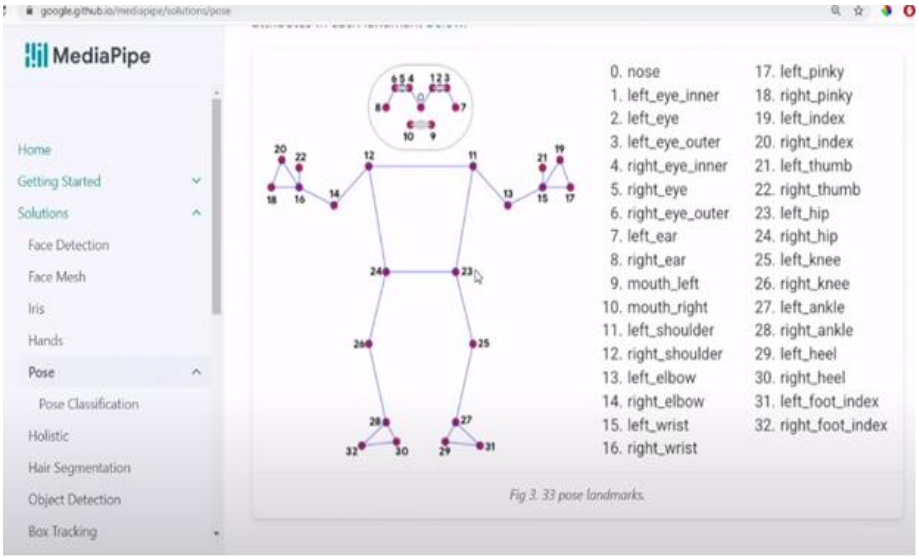



*Fig 3. 33 pose landmarks.*

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
( Peer-Reviewed, Open Access, Fully Refereed International Journal )
Volume:03/Issue:11/November-2021 Impact Factor- 6.752 www.irjmets.com

**Output**



## V. CONCLUSION

AI is at the centre of a new enterprise to build computational models of intelligence. The main assumption is that intelligence (human or otherwise) can be represented in terms of symbol structures and symbolic operations which can be programmed in a digital computer. This project based on AI Training using OpenCv and python have many future implementations like they can be used in this covid 19 .Adopting and integrating AI technologies is a roller-coaster ride no matter how business-friendly it may sound. A Deloitte report says, around 94% of the enterprises face potential Artificial Intelligence problems while implementing it.As an AI technology consumer and developer, we must know about both the merits and the challenges associated with the adoption of AI.

## VI. REFERENCES

[1] OpenCV, Open source Computer Vision library. In
[2] http://opencv.willowgarage.com/wiki/, 2009
[3] Facial Recognition using OpenCV, Shervin EMAMI1, Valentin Petruţ SUCIU2., www.jmeds.eu.
[4] http://docs.opencv.org/modules/imgproc/doc/imgproc.html
[5] Ammar Anuar, Khairul Muzzammil Saipullah, Nurul Atiqa h Ismail, Yewguan Soo "OpenCV Based Real-Time Video Processing Using Android Smartphone" , IJCTEE, Volume 1, Issue 3
[6] http://en.wikipedia.org/wiki/OpenCV
[7] https://blog.cedric.ws/opencv-simple-motion-detection.