APPLICATION OF HAND DETECTION IN PPT AND MOTION DETECTION IN UNITY FOR ANIMATION USING PYTHON AND C# IN RASPBERRY PI

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Abstract: The main aim is to build an hand detection and motion detection module and implementing them in the different platform. And injecting this system into the raspberry-pi4 b. Hand detection and motion detection is one of the most concern detection in machine learning and in object detection world. By using this detection we can implement it in different forms of platform inside a raspberry-pi. Our hand detection is implemented in the presentation module by inserting the presentation slides into the raspberry pie we can connect the slides then the slide will enter into the hand detection environment where the slides can be controlled by hand no need of keyboard or mouse and no need of digital pens. We can just perform additional operations such as writing in slides and turning pages front and backwards. And erasing the sketched text. By this the classes will be more interactive and we can reduce the cost of the extra accessories.

And for motion detection for spending most of the time in detecting every single motion is harder. This project came with the solution where the detection can be done from the video easily and we can get the landmark point of the every motion and store in as the text and collecting these text to the unity world we can convert the normal videos into an animated video using C# and python. This project system is mainly based on the reduction of cost to getting different tech components for a single processing and in executing the same output which costs us tons of money in other separate technologies.

**Keywords: Raspberry pi, py charm, hand detection, motion detection,**

I.INTRODUCTION

In case of creation of new technology with detection modules, implementing detection which can be integrated in different platforms, in our case we have implementing two different detection in two different platform which is hand detection and motion detection , where the hand detection implemented in the presentation module which includes paper presentation with has been implemented using the DCNN and YOLO algorithm on python where we don't need of keyboards or mouse with just a single hand we can present the presentation effectively . And implementing the motion detection and extracting the land mark point of 33 and integrating into the unity environment and we can convert the normal video into the animated video.

By implementing these detections in raspberry pi the cost to implement the same functionalities with different device which only does a single functionalities which we are doing in the raspberry pi, but in pie we can just configure the different functionalities and easy to control both on pc and mobiles and it minimizes the cost and easy to carry these heavy weight technology code. By enforcing the right deep convolution neural community we are able to attain unique device gaining knowledge of technology. Finding technology is not easier but doing the new technology in easier way which everyone can understand is hard. So we are going with python open cv which makes easier for developer and for others to understand the codes .and for animation we are going with the fastest and hardest programing language which is C#. with this the code looks light weight and easy to carry out the project.

2.METHODOLOGY
Arduino Uno Connection:
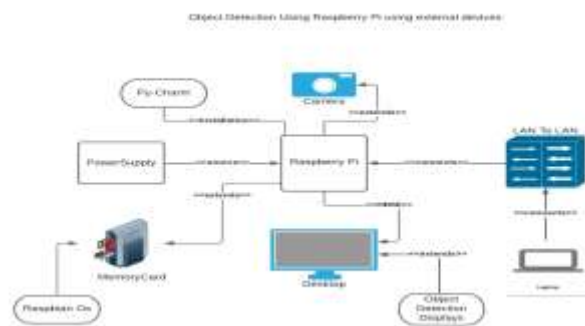
HARDWARE REQUIREMENTS:
- Raspberry Pi
- Pi Camera
- Power Chord
- Memory Card (32Gb)

SOFTWARE REQUIREMENTS:
- Pycharm
- Unity
- C#,Python

2.2 Raspberry Pi 4B

In comparison to the model 3b, which was published before this one, it tends to boost processing speed and editing speed, memory, and allow wireless communication across networks, while maintaining backwards compatibility and similar power consumption. Furthermore, this 4B provides desktop performance in all entry-level x86 computer systems. This device has a 64-bit quad-core processor that supports two HDMI 4K inputs and hardware video decoding at up to 4kp60, as well as up to 4GB of RAM. This lets in the board to guide twin band wi-fi and Bluetooth has modular compliance certification. lets in the board to be included into completed merchandise with greater ease.

**Physical Specification Of Raspberry Pi**
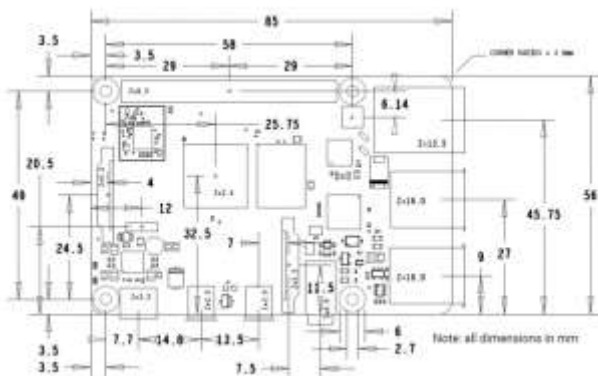
Quad-core Cortex-A72 Broadcom BCM2711 (ARM v8) 4GB LPDDR4-3200 SDRAM 64-bit SoC @ 1.5GHz (depending on model) IEEE 802.11ac wireless (2.4 and 5.0 GHz), Bluetooth 5.zero, BLEGigabit Ethernet 2 USB ports 2 USB 2.zero ports and three USB 3.zero ports 40-pins GPIO headers for Raspberry Pi (actually backwards properly matched with previous boards) There are micro-HDMI port (as much as 4kp60 supportes)MIPI DSI display port with two lanes MIPI CSI camera port with two lanes H.265 (4kp60 decoding), H264, 4-pole stereo audio and composite video port (1080p60 decode, 1080p30 encode) Micro-SD card port for loading operating system and data storage OpenGL ES 3.1, Vulkan 1.0 5V DC (minimum 3A*) through USB-C connector.

Raspberry Pi Camera

The Raspberry Pi 5MP Camera Module. The version2 digital digicam module has a sony imx219 5-mp sensor (as compared to the 5-mp unmarried imaginative and prescient ov5648 sensor of the digital digicam).This digital digicam module may be used to make high-definition video, in addition to nevertheless photograph. It's smooth to apply for novices and advance, however has lots to provide superior customers if all and sundry seeking to increase your knowledge. There are plenty of examples on line of human beings the usage of it for video enhancing cleverness or even we are able to boom the body fee

of the digital digicam it's a jump ahead in photo quality, Shadeation and low-moderate performance. It permits 1080p30, 720p60 and vga90 video modes, in addition to aleven though captures. It attaches to the 15m ribbon cable to the digital virtual digital digicam serial interface port at the raspberry.

DCNN Algorithm
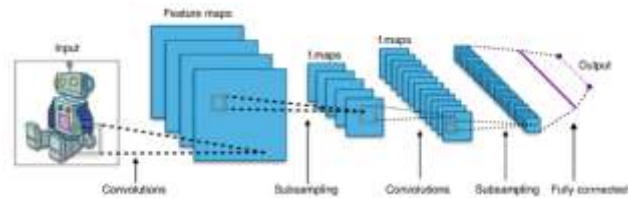
Several neural network layers make to a DCNN. Convolutional and pooling layers are often alternated in most cases. From left to right in the network, the depth of each filter rises. One or extra completely linked layers regularly make up the very last stage: There Are Three Key Intuitions Beyond Convnets:

- Local Receptive Fields

- Shared Weights

- Pooling

DCNN

• Artificial intelligence (ai) structures are constructed the use of deep gaining knowledge of, a gadget gaining knowledge of technique. It's based on the concept of artificial neural networks (ann), which use numerous layers of neurons to do complex analysis on enormous volumes of data.

• Deep neural networks are available in a variety of shapes and sizes (dnn). Deep convolutional neural networks (cnn or dcnn) are the maximum common sort of photograph and video sample popularity system. Dcnns are an evolution of classic artificial neural networks that use a three-dimensional neural pattern inspired by animal visual brain.

• Deep convolutional neural networks are primarily employed for object identification, picture classification, and recommendation systems, but they are also used for natural language processing on occasion.

Deep Convolution Neural Network
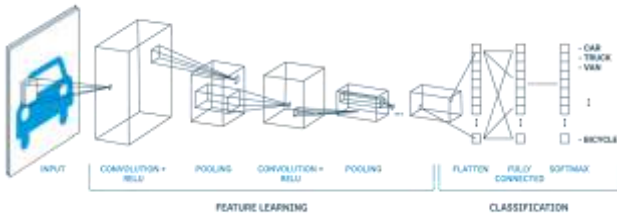
The stacking of DCNN is their strength. A DCNN processes the red, green, and blue parts of an image simultaneously using a three-dimensional neural network. In comparison to standard feed forward neural networks, this significantly reduces the number of artificial neurons required to process an image.

Images are fed into deep convolutional neural networks, which might be then used to teach a classifier. Instead of matrix multiplication, the community makes use of a specific mathematical technique called "convolution."

A convolutional network's architecture typically has four layers: convolution, pooling, activation, and fully connected.

YOLO Algorithm

Yolo is a real-time item detection set of rules this is finished with neural networks. This set of rules is famous for its pace and precision. Detects traffic lights, pedestrians, parking metres, and animals in a variety of applications.

This paper will demo readers to the yolo odm and explain This the way it works. It also emphasises some of its real-world uses.

The acronym Yolo stands for "You Only Look Once." This is an algorithm that finds and recognises various things in a photograph that is captured in real time. The yolo set of rules treats item detection as a regression difficulty that consists of elegance chances for the observed images.

The cnn is used by the Yolo algorithm to detect objects in real time. To detect objects, the approach just takes a single forward propagation through a neural network, as the name suggests.

This means that while the programme is running, a single method is used to anticipate the entire image. Class possibilities and bounding packing containers are anticipated concurrently the use of a convolutional neural network.

Within a unmarried class, the yolo set of rules has numerous versions. Yolo version 3 and mini yolo are two popular examples.

YOLO Algorithm

The Yolo algorithm employs the following three methods:

• Bounding box regression method
• Residual blocks design

Over a specific union, intersection (iou) Blocks that remain The image is initially separated into several grid lines. The dimensions of each grid are s x s. The figure below illustrates how an input image is divided into grid lines to detect details.

There are many grid cells of same dimensions withinside the picture above. When an object arrives within a grid cell, every grid cell will notice it. If an object centre occurs within a grid cell, the grid cell will become green, indicating that this cell is responsible for detecting it.

EXISTING SYSTEM AND PROPOSED SYSTEM

| Existing System	Proposed System
There isn't any incorporated one generation to different generation.From ppt or image switcher in separate module	In this paper we found a detection module which can perform different operation like hand detection and motion detection .
Drawbacks: Required separate object technologies for separate operation	Easy work, low cost, high performance
cost of relatable is high hard to make a set up	This will detect the hand gestures accordingly and detects the motion and converts them into animated video

LITERATURE SURVEY

[1] This research proposes a revolutionary way for controlling an intelligent hand that can emulate the natural movement of the human hand. Humanoid and personal robots alike can benefit from the implementation of such an intellectual hand. In this paper, vision-based interaction techniques are utilised to correctly and quickly monitor the movements of the fingers and extract the motion of the hand gesture. For real-time motion-based applications, accuracy and efficacy are

critical. The Raspberry Pi processor is used to control the entire setup, which includes a camera module for motion capture. To characterise the hand in the film, face subtraction and skin colour detections are utilised. To track the mean shift algorithm is utilised.

WORKING PRINCIPLE AND SETUP

The system is implemented using raspberry pi 4 b. The system has employed with raspberry pi camera to detect the hand to track the gesture operation. According to the command given to the raspberry pi act as the detection module and it will start presenting the ppt and the hand detection at the same time it will record every single gesture in real time and the pi will act according to that gesture and other detection is complete motion detection which will record our video and detect the every land mark and store it as X,Y,Z parameters and integrating the code to the unity environment and converting the normal video into the animated environment with the help of high performing programing language which is c#.
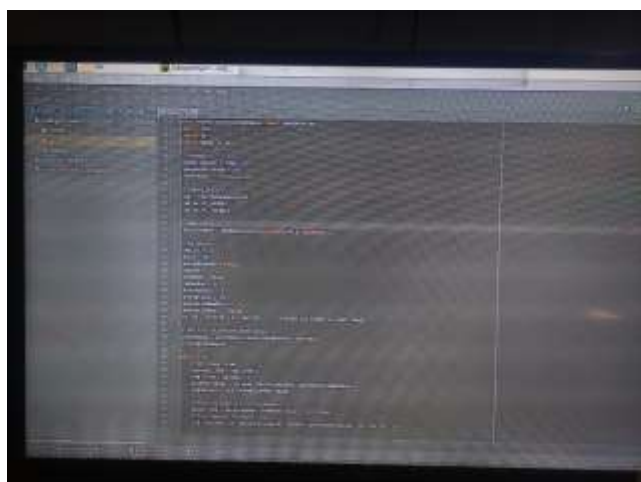
RESULT
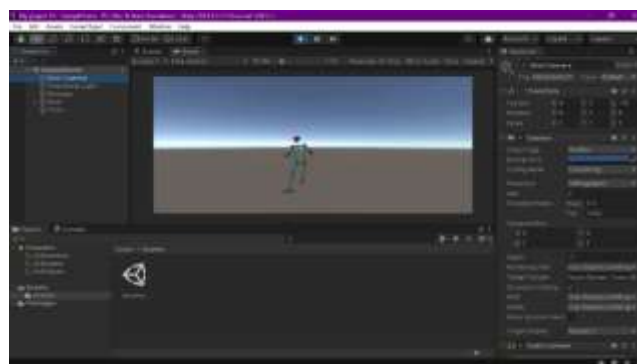
CONCLUSION

In this paper, we monitor the hand detection .and motion detection and converting them into an animated video using the raspberry pi and unity. The system detects the gestures and the raspberry pi program act accordingly to the gestures. And for motion detection the raspberry pi detects the motion of the video and store it in a TXT as X,Y,Z parameters and integrating them to the unity environment to convert them to the animated video.

The main aim is to invent new technology and integrating them to the different environment to perform the action with the new technology and to reduce the cost of objects which requires additional amount for lesser features.

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