A Gesture-based Tool for Sterile Browsing of Radiology Image CNN and Open CV

INDEX:

1.INTRODUCTION:

Humans are able to recognize body and sign language easily. This is possible due to the combination of vision and synaptic interactions that were formed along brain dvelopment.In order to replicate this skill in computers,some problems need to be solved: how to seperate objects of intrest in images and which image capture technology and classification technique are more appropriate, among others.

In this project Gesture based Desktop automation,First model is trained pre traines on the images of different hand gestures,such as showing numbers with fingers as 1,2,3,4.This model uses the integrated webcame to capture video frame.The image of the gesture captured in the video frame is compared with the Pre-trained model and the gesture is identified.If the gesture predictes is 1 then image is blurred;2, image is resized;3, image is rotaed etc..

Overview:

1.Defining our classifiaction categories

2.Collect training images

3.Train the model

4.Test our mode

2.LITERATURE SURVEY :

TO complete this project, you must require following software's, concept and packages

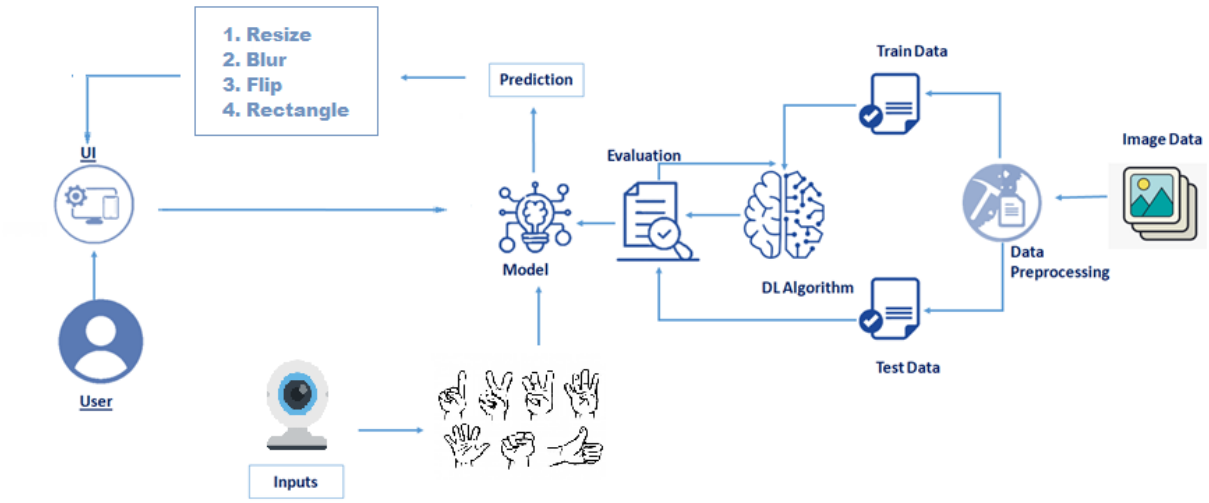
- **Anconda navigator**

  ☞ Refer to the link below to download anaconda navigator

- **Python packages:**
  - ☞ Open anaconda prompt as administrator
  - ☞ Type "pip install tensorflow" (make sure you are working on python 64 bit)
  - ☞ Type "pip install opencv-python
  - ☞ Type "pip install flask".

3.THEORITICAL ANALYSIS:

BLOCK DIAGRAM:



4.EXPERIMENTAL INVESTIGATIONS:

CNN : A convolutional neural network is a class of deep neural networks, most cpmmonly applied to analyzing visual imagery.

Opencv - It is an Open Source Computer Vision Library which are mainly used for image

processing,video capture and analysis including features like face detection and object detection.

Flask: Flask is a popular web python web framework,meaning it is a third-party Python library used for developing web applications.

5.FLOWCHART:

Project Flow:

- User interacts with the UI(User Interface) to upload image input
- Depending on the different gesture inputs different operations are applied to the input image.
- Once model analyses the gesture,the predection with operation applied on image is showcased on the UI.

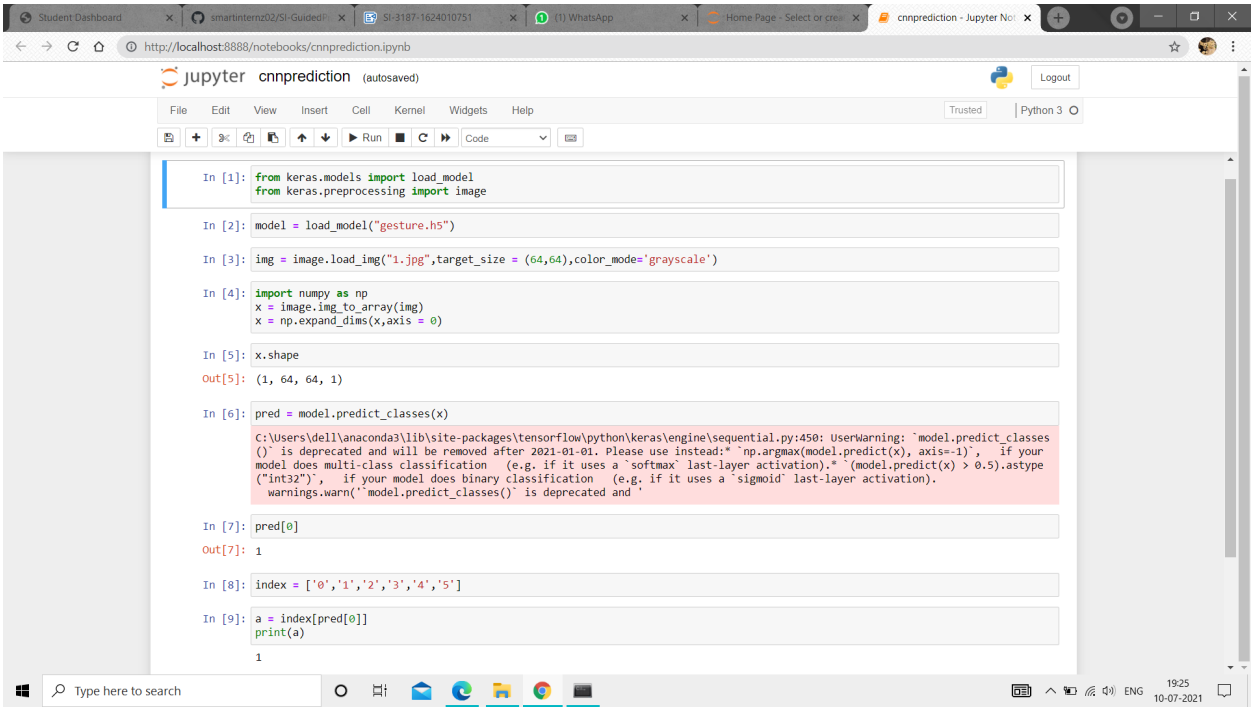
To accomplish this,we have to complete all the activities and tasks listed below

- Data Collection
- Data Preprocessing
- Import the ImageDataGenerator library
- Configure ImageDataGenerator class
- Model Buliding
    - Import the model building libraries
    - Intializing the model
    - Addding Input Layer
    - Adding Hidden Layer
    - Connfigure the learning process
    - Training and Testing the model
    - Save the MoAdel
- Application Building
    - Create an HTML file
    - Build Pytho Code

6.RESULT:

This project aims at developing a system which is a sterile gesture interface for users,such as doctors/surgeons, to browse medical images in a dynamic medical environment.

A vision-based gesture capture system interprets user's gesture in realtime to navigatr through and manipulate an image and data visualization evnironment.Developed a deep learning model using CNN implemented in Keras backend Tensorflow and OpenCV which can recognize various gestures.



7.ADVANTAGES AND DISADVANTAGES :

Advantages:

- Very high accuracy in image recognization problems.

- Automatically detects the important features without any human supervisions.
- Weight sharing

Disadvantages:

- CNN do not encode the position and orientation of object.
- Lack of ability to be spatially invariant to the input data
- Lots of training data is required

8.APPLICATIONS:

- ✓ Decoding Facia Recognization
- ✓ Analyzing Documents
- ✓ Historic and Environmental Collections
- ✓ Understanding Climate
- ✓ Grey Areas
- ✓ Advertising
- ✓ Other Interesting Fields

9.CONCLUSION:

- Know fundamental concepts and techniques of Convolution Neural Networks.
- Gain a broad understanding of image data.
- Know how to pre-process/clean the data using different data preprocessing techniques
- Know how to build a web application using Flask framework

10.FUTURE SCOPE:

neural nets also have the power of flexibility. Once established, they can be applied to almost anything, whether it's helping people spot the issues interfering with their productivity or improving air traffic patterns for smoother flights. The core functionality of a neural net is to learn something efficiently, so if you have a system that can learn to recognize patterns, it could feasibly recognize patterns in almost any domain.

11.BIBILOGRAPHY:

We use References of previous works in websits.

A Gesture-Based Tool For Sterile Browsing Of Radiology Im - Google Search

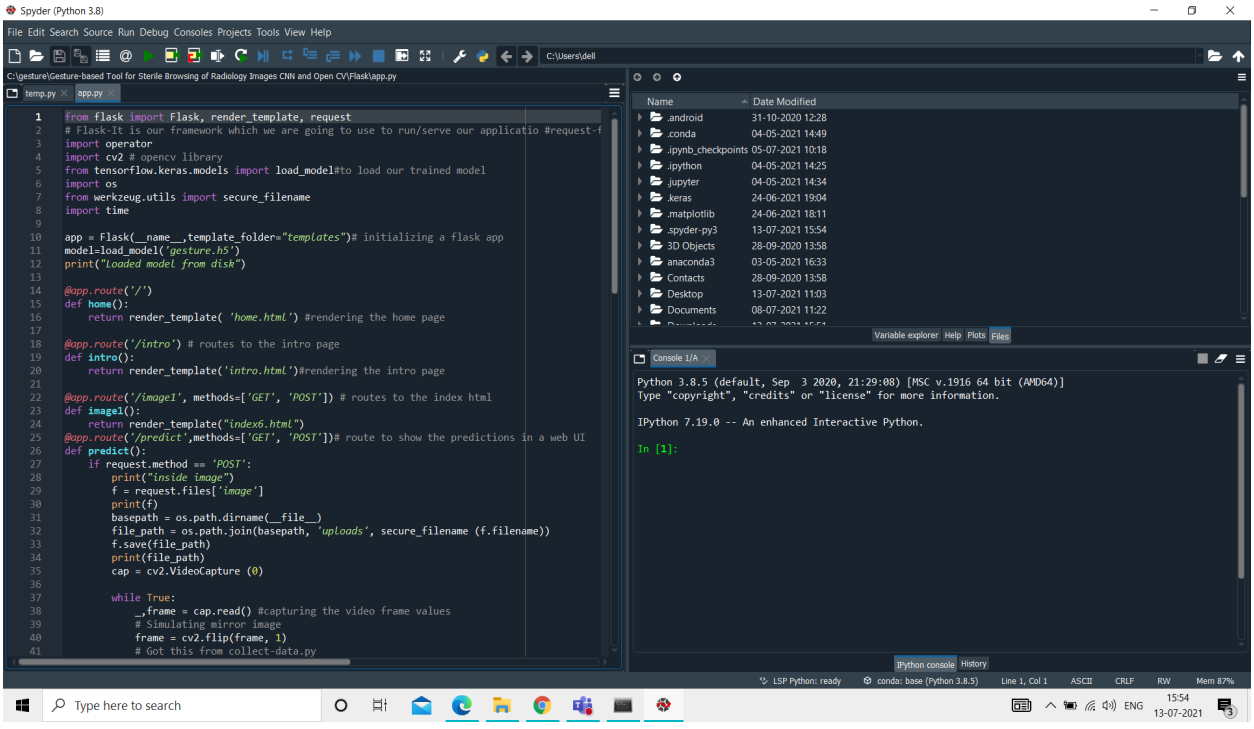
We used saw some Reference videos in You Tube.

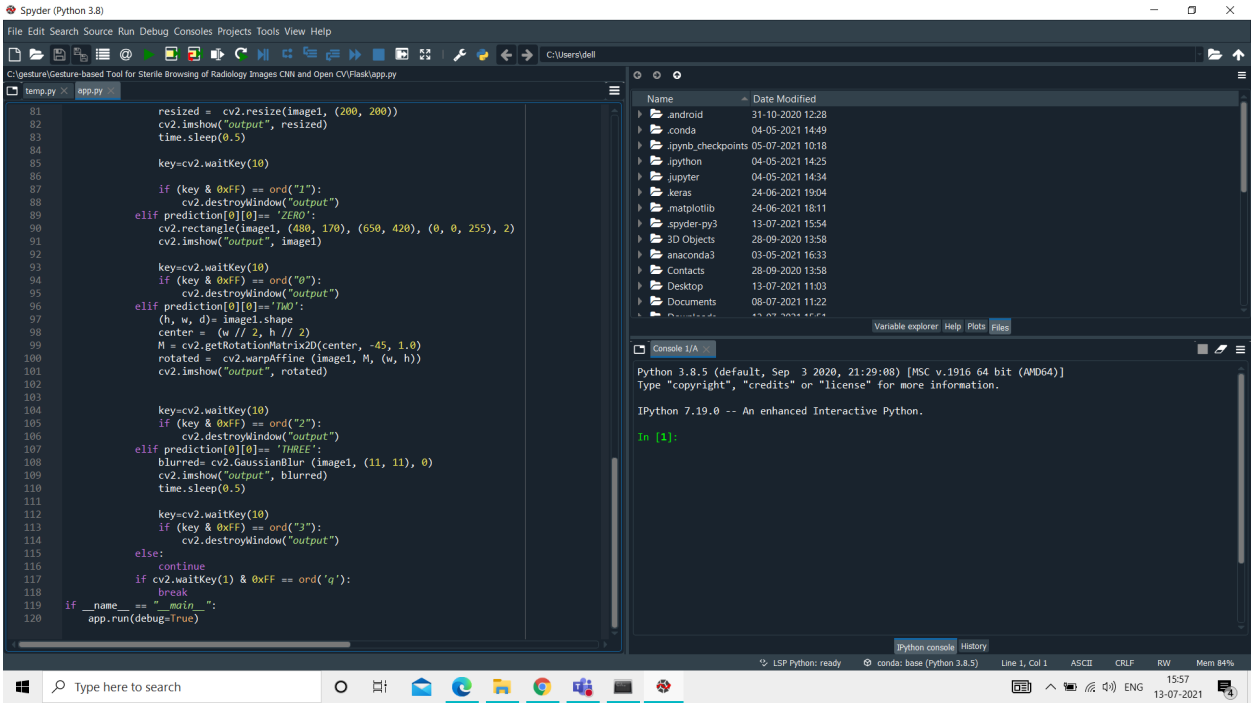
https://youtu.be/4y_zD-0Q3F8

https://youtu.be/BzouqMGJ41k

12.APPENDIX:

a.Source Code





b.UI output Screenshot :