DETECTING PARKINSON'S DISEASE USING IBM WATSON MEACHINE LEARNING

A UG PROJECT PHASE -1 REPORT

Mini Project documentation submitted to

JAWAHARLAL NEHRU TECNOLOGICAL UNIVERSITY, HYDERABAD

In partial fulfillment of the requirements for the award of the degree of

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

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CERTIFICATE

This is to certify that the project report entitled **"DETECTING PARKINSON'S DISEASE USING IBM WATSON MACHINE LEARING"** is a bonafide record of work carried out by **PADIDALA SRINIKHIL (19UK1A05M5),GADDAM DEEKSHITHA(19UK1A05P2),DONTHULA ARUN(20UK5A0506)** under the guidance and supervision of **Mr.INDRA PRAKASH CHAUHAN** in the partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology in Computer Science and Engineering of Jawaharlal Nehru Technological University, Hyderabad** during the academic year 2019-23.

Guidance **HOD**

Dr.K.SHARMILA REDDY **Dr. R.NAVEENKUMAR**

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.

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INTERNSHIP REPORT APPROVAL FORM

Date

With immense pleasure, this is to approve that the students of Vaagdevi Engineering College i.e,

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successfully completed their Project and Project Report on "**DETECTING PARKINSON'S DISEASE USING IBN WATSON MACHINE LEARNING"** under our guidance.

We are highly impressed with the work that they have done and commend them on their quick grasping skills. They have shown good intent to learn and have put the knowledge gained into application in the form of this project. We appreciate the hard work and commitment shown by them.

We, hereby approve that this document is completely checked and accepted by SmartBridge Technical Team. been an absolute pleasure to educate and mentor these students. We hope that this document will also serve as a Letter of Recommendation, to whomsover applied.

We wish them success in all future endeavors and a great career ahead.

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1.INTRODUCTION

1.1OVERVIEW

According to the Parkinson's Foundation in worldwide more than 10 million people are suffering from Parkinson's Disease. While Parkinson's cannot be cured, early detection along with proper medication can significantly improve symptoms and quality of life. The researchers found that the drawing speed was slower and the pen pressure is lower among Parkinson's patients. One of the main indications of Parkinson's is tremors and rigidity in the muscles, it will make difficult to draw smooth spirals and waves. According to the researchers It is possible to detect Parkinson's disease using the drawings alone instead of measuring the speed and pressure of the pen on paper. Our main goal is to quantify the visual appearance using HOG method of these drawings written by the persons and then train a machine learning model to classify these drawings. In this model, we are using, Histogram of Oriented Gradients (HOG) image descriptor along with a Random Forest classifier to automatically detect the Parkinson's disease using hand-drawn images of spirals and waves form drawings.

1.2 PURPOSE

Early detection of a Parkinson's disease could be useful for the identification of people who can participate in trials of its agents, or ultimately to try and halt disease progression once effective disease-modifying interventions have been identify

2.LITERATURE SURVEY

- · Richa Mathur et al [23] suggested a method for predicting the PD. They used a weka tool for implementing the algorithms to perform preprocessing of data, classification and the result analysis on the given dataset. They used k-NN along with Adaboost.M1, bagging, and MLP. It was observed that k-NN + Adaboost.M1 yielded the best classification accuracy of 91.28%

- . · A.Yasar et al [24] used artificial neural networksfor the detection of Parkinson's disease. The dataset was taken from UCI machine learning repository. Using the MATLAB tool, 45 properties were chosen as input values and one output for the classification. Their proposed model was able to distinguish the healthy subjects from the PD subjects with an accuracy of 94.93%

- . · Max A. little et al [15] suggested a novel technique for the classification of subjects into Parkinson diseased and control subjects by detecting dysphonia. In their work, pitch period entropy (PPE) a new robust measure of dysphonia was introduced. The data was collected from 31 people (23 were PD patients and 8 were healthy subjects) which comprised of 195 sustained vowel phonations. Their methodology consisted of three stages; feature calculation, preprocessing and selection of features and finally the classification. For the classification purpose, they used linear kernel support vector machine (SVM). Their proposed model achieved an accuracy of 91.4%.

- · To separate the healthy subjects from PD subjects, Ipsita Bhattacharya et al [20] used a tool for data mining known as weka. They used SVM, a supervised machine learning algorithm for the classification purpose. Prior to classification, the data preprocessing was done on the dataset. Different kernel values were used to get the best possible accuracy by applying libSVM. The linear kernel SVM produced the best accuracy of 65.2174%, whereas the RBF kernel and polykernel SVM achieved the accuracy of 60.8696%

2.1 PROPOSED SOLUTION

Machine learning is a subfield of artificial intelligence (AI). The goal of machine learning generally is to understand the structure of data and fit that data into models that can be understood and utilized by people. Although machine learning is a field within computer science, it differs from traditional computational approaches. In traditional computing, algorithms are sets of explicitly programmed instructions used by computers to calculate or problem solve. Machine learning algorithms instead allow for computers to train on data inputs and use statistical analysis in order to output values that fall within a specific range. Because of this, machine learning facilitates computers in building models from sample data in order to automate decisionmaking processes based on data inputs. In machine learning, tasks are generally classified into broad categories. These categories are based on how learning is received or how feedback on the learning is given to the system developed. Two of the most widely adopted machine learning methods are: -

• **Supervised learning** which trains algorithms based on example input and output data that is labeled by humans.

• **Unsupervised learning** provides the algorithm with no labeled data in order to allow it to find structure within its input data.

3.THEORITICAL ANALYSIS

3.1 BLOCK DIAGRAM

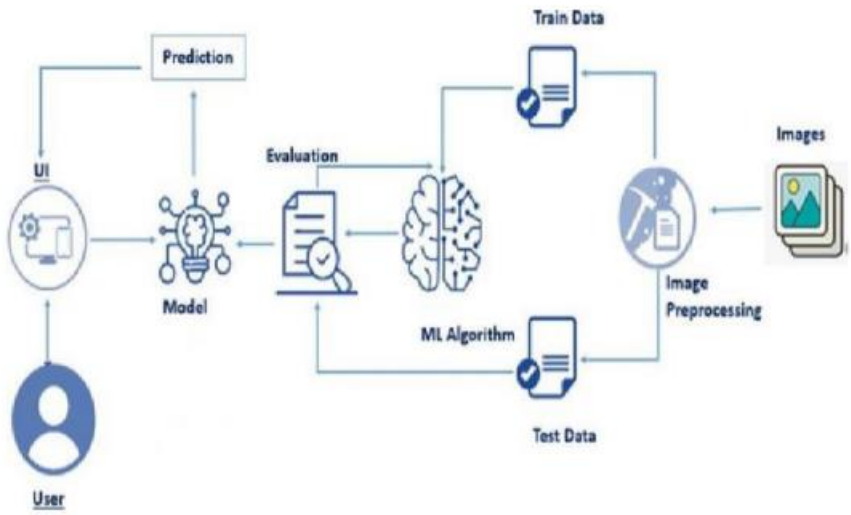


Fig:3.1

3.2 HARDWARE/SOFTWARE DESIGNING

In this model we used some software and hardware tools follow are there

Software Requirements

• Operating System : Microsoft Windows 10

- Anaconda3
- Jupyter Notebook
- Google calloboratory
- Spyder

Hardware Requirements

• Main Processor : Intel core i3, Intel core i5

• RAM Size : 4.00 GB

• Processor Speed : 2.60 GHz

In this we used convolution neural network system ,below diagram shows how it works.

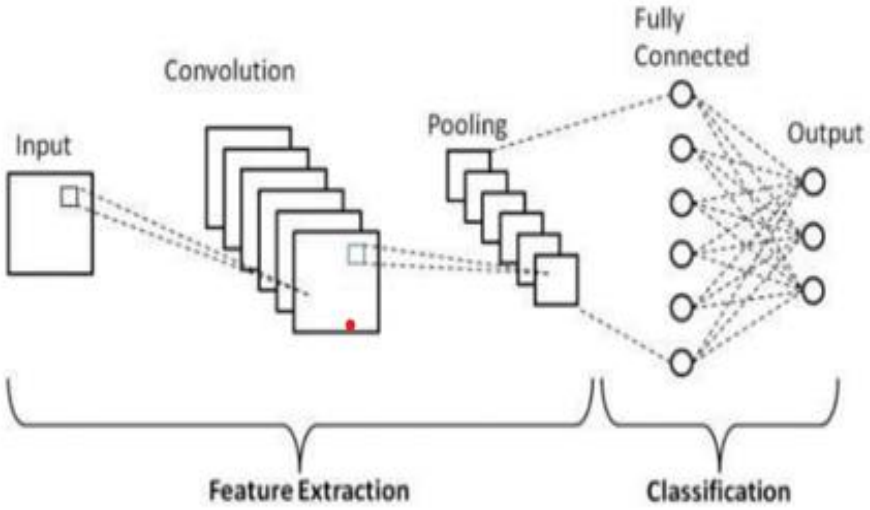
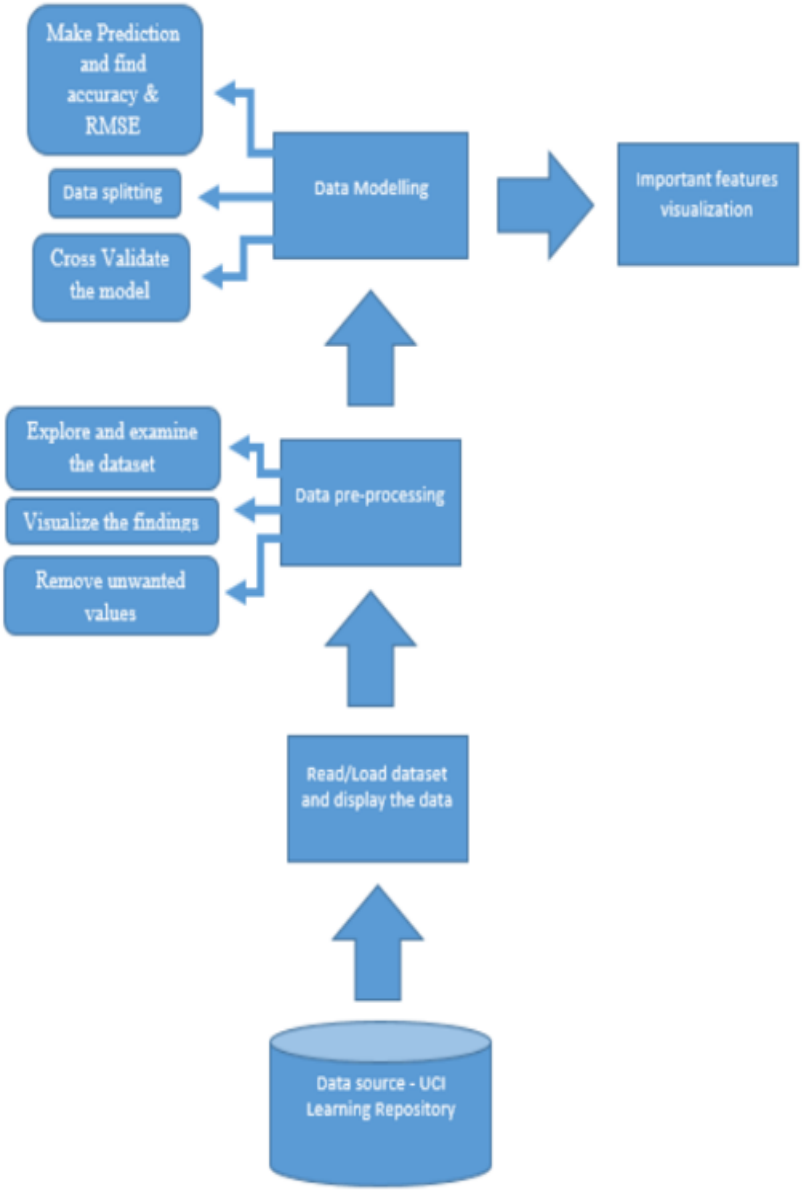


Fig:3.2 convolution neural network system

4.DESIGN


Make Prediction and find accuracy & RMSE
Data splitting
Cross Validate the model
Data Modelling
Important features visualization
Explore and examine the dataset
Visualize the findings
Remove unwanted values
Data pre-processing
Read/Load dataset and display the data
Data source - UCI Learning Repository

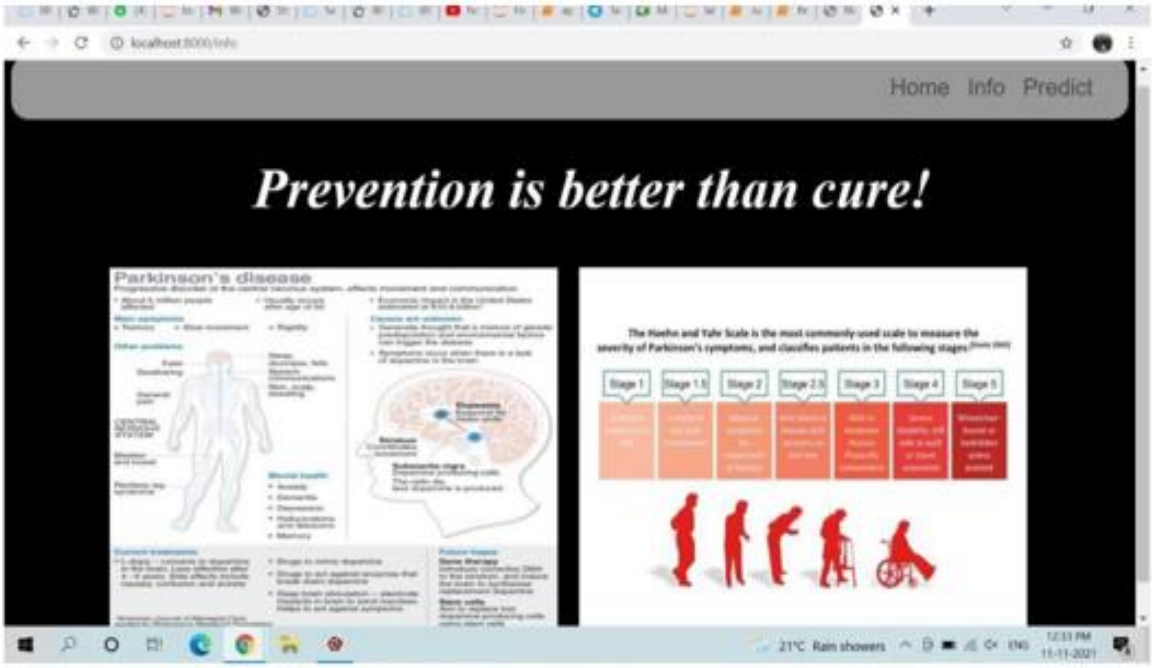
5.EXPERIMENTEL AND RESULTS

For the implementation of the project, we have gone through several research papers from the "research gate" website. We have also gone through several You tube channels including the Krish Naik channel. We have gone through several websites including towardsdatascience.com, tutorials point, geeks for geeks, etc

6.RESULT

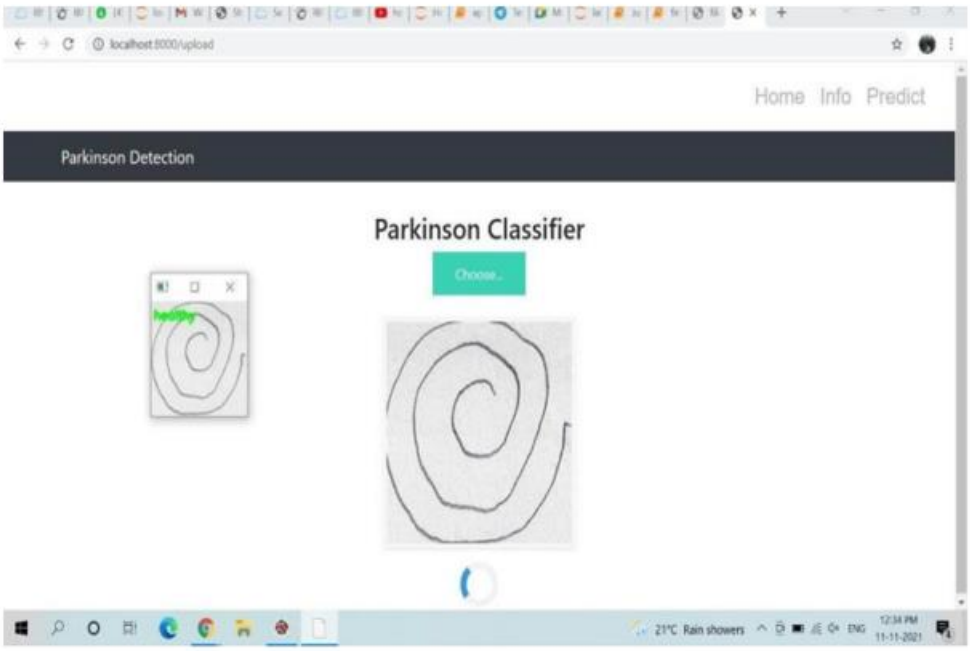
Home page of the model

The Parkinson home page it gives the brief information about the project and little bit about Parkinson disease and the images shows that how the healthy persons brain and Parkinson's diseased person brain structure.



Information page

The Parkinson information page, this gives brief about the disease and what are the effects of this disease, how many stages are there and in which stage what happens all information are there in this page.

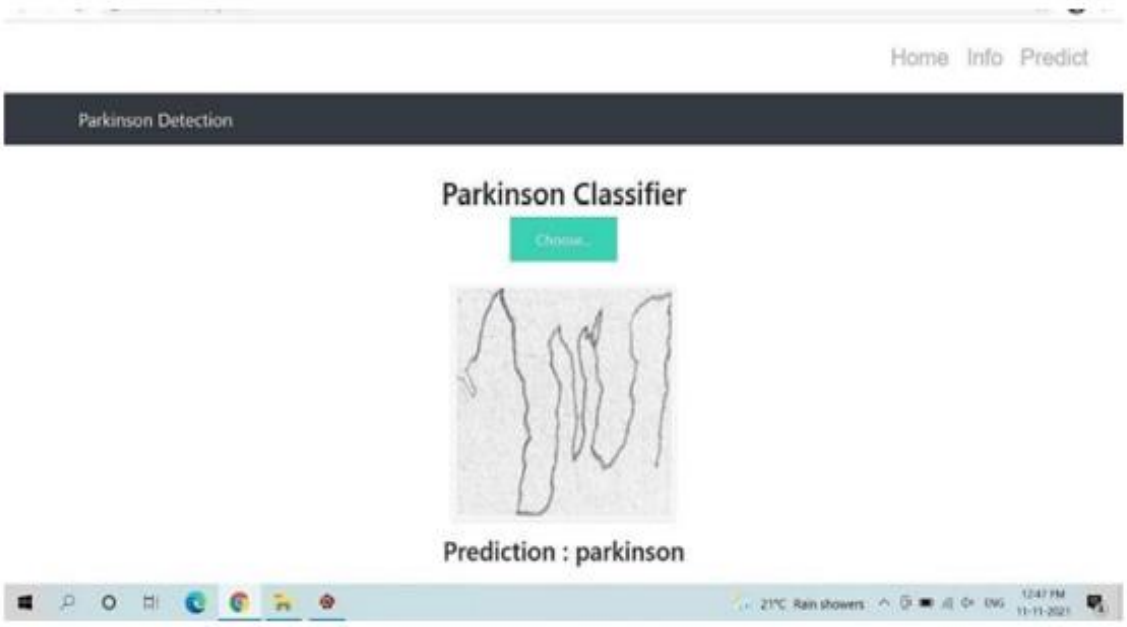


Prediction page

In this model we predicting the hand drawn spiral images of the person, after processing the image model gives the result has the person is healthy and good

Predicting spiral image of disease person

In this we predicting the spiral image of disease person and the model gives the output has Parkinson means the person has Parkinson's disease



Predicting wave image of disease person

In this we predicting the wave image of disease person and the model gives the output has Parkinson means the person has Parkinson’s disease

7.ADVANTAGES&DISADVANTAGES

ADVANTAGES:

- They recoginized faster and more accurately
- The model is trained to learn the low level to high level features and the classification results are validated.
- Thus with a rapid growth in the deep learning architecture, an objective diagnosis of parkinsons's disease will no longer be a laborious job for the clinicians in the future
- This research will allow a non-contact ,easy to use and low cost test that can be performed routinely anywhere in the world ,where the clinicians can monitor their patients remotrly

DISADVANTAGES:

- MRI imaging involves high cost of production
- The image resolution is low so the face expression will not be detected
- For training model we need high quality images. Which is quite expensive and time taking.
- The accuracy of the model is good. But really not so appropriate to the current situation. Since according to current situation, we need the accuracy around 97%. So that we can get good result.

8.APPLICATIONS

- This can be used to help the Docters to identify the Parkinson disease with a single photo click which helps the user to identify the disease. And provide appropriate solution.
- Early detection ,diagnosis and treatment could help manage these illnesses

9.CONCLUSION

In this process we can predict the parkinsons disease in patient's body using machine learning technology and this method makes the process easy to our user. Our analysis provides very accurate performance in detecting Parkinson's disease using machine learning and CNN .

Parkinson's disease affects the CNS of the brain and has yet no treatment unless it's detected early.Late detection leads to no treatment and loss of life.The proposed method aimed to cover a broader space of imaging and machine learning technologies for mental illness diagnostics such that researchers in the field could readily identify the state of the art in the domain. Moreover, in this we emphasize the importance of early detection and prediction of Parkinson's disease, such that treatment and support can be provided to patients as soon as possible and the effects of the disease can be decreased.

10.FUTURE SCOPE

In this project we have used the convolution Neural Network which yielded a good accuracy around 92% but there are far more advanced techniques including Resnet networks, VGG networks and Dense Net networks which can work much better when compared to traditional CNN.

To find out the Parkinson's diseases we use the methods call MRI scannings and some conventional methods. In this process we spend more money for brain scannings it is a big drawback ,to overcome this problem oriented we are coming up with a new proposed solution .

Most of the people who have Parkinson's, they tend to live away from these medical centers not receiving the proper treatment and care from an expert. an artificial intelligence system that could detect Parkinson's disease in patients earlier than currently possible by analyzing a person's breathing pattern. The tool could improve the diagnosis and treatment of the ailment, which eludes a cure.

11.BIBILOGRAPHY

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APPENDIX

SOURCE CODE OF FLASK:

```
import pickle
import cv2
from skimage import feature
from flask import Flask,request, render_template
import os.path
app=Flask(__name__)#our flask app

@app.route("/") #default route
def about():
   return render_template("about.html")#rendering html page

@app.route("/about") #route about page
def home():
   return render_template("about.html")#rendering html page

@app.route("/info") # route for info page
def information():
   return render_template("info.html")#rendering html page

@app.route("/upload") # route for uploads
def test():
   return render_template("index6.html")#rendering html page

@app.route('/predict', methods=['GET', 'POST'])
def upload():
   if request.method == 'POST':
      f=request.files['file'] #requesting the file
      basepath=os.path.dirname(__file__)#storing the file directory
      filepath=os.path.join(basepath,"uploads",f.filename)#storing the file in uploads folder
      f.save(filepath)#saving the file
      #Loading the saved model
      print("[INFO] loading model...")
      model = pickle.loads(open('D:\\project\\Flask_App\\parkinson1.pkl', "rb").read())
      # pre-process the image in the same manner we did earlier
      image = cv2.imread(filepath)
      output = image.copy()
      # load the input image, convert it to grayscale, and resize
      output = cv2.resize(output, (128, 128))
```

```
        image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)
        image = cv2.resize(image, (200, 200))
        image = cv2.threshold(image, 0, 255,
        cv2.THRESH_BINARY_INV | cv2.THRESH_OTSU)[1]

        # quantify the image and make predictions based on the extracted
        # features using the last trained Random Forest
        features = feature.hog(image, orientations=9,
        pixels_per_cell=(10, 10), cells_per_block=(2, 2),
        transform_sqrt=True, block_norm="L1")
        preds = model.predict([features])
        print(preds)
        ls=["healthy","parkinson"]
        result = ls[preds[0]]


        # draw the colored class label on the output image and add it to
        # the set of output images
        color = (0, 255, 0) if result == "healthy" else (0, 0, 255)
        cv2.putText(output, result, (3, 20), cv2.FONT_HERSHEY_SIMPLEX, 0.5,color, 2)
        cv2.imshow("Output", output)
        cv2.waitKey(0)
        return result
    return None

if __name__=="__main__":
    #app.run(debug=False)#running our app
    app.run(debug=False)
```