

Final Code For Flask Application:

- Make Sure that all the Packages are installed
- This code has been saved and executed successfully using Pycharm. This code belongs to team-PNT2022TMID51815.

```
from flask import Flask,render_template,Response, request

import cv2 from cvzone.HandTrackingModule import

HandDetector from cvzone.ClassificationModule import

Classifier import numpy as np import math import pyttsx3

import keyboard app=Flask(__name__) cap =

cv2.VideoCapture(0) detector =

HandDetector(maxHands=1) offset = 20 imgSize = 300

str=""

# classifier = Classifier("A2i.h5", "labels2j.txt") classifier =

Classifier("Models/keras_model.h5", "Models/labels.txt")

labels={0:"A", 1:"B", 2:"C", 3:"D",4:"E",5:"F", 6:"G",7:"H",8:"I",9: "J", 10:"K", 11:"L", 12:"M", 13:"N",

14:"O", 15:"P",16:"Q",17:"R",18:"S",19:"T",20:"U",

21:"V",22:"W",23:"X",24:"Y",25:"Z"} def

function(img):

    success, frame = cap.read() imgoutput =

frame.copy() hands, frame =

detector.findHands(frame) return frame

def generate_frames():

    #str=""

global str

while True:
```

```

#labels = {0: "A", 1: "B", 2: "C"}

## read the camera frame

success, frame = cap.read()

if not success:

    break

else:

    success, frame = cap.read()    imgOutput =
frame.copy()    hands, frame =
detector.findHands(imgOutput)

    if hands:

        hand = hands[0]

x, y, w, h = hand['bbox']

imgWhite = np.ones((imgSize, imgSize, 3), np.uint8) * 255

imgCrop = frame[y - offset:y + h + offset, x - offset:x + w + offset]

imgCropShape = imgCrop.shape

aspectRatio = h / w

if aspectRatio > 1:    k = imgSize / h    wCal =
math.ceil(k * w)    imgResize = cv2.resize(imgCrop, (wCal, imgSize))

imgResizeShape = imgResize.shape    wGap = math.ceil((imgSize -
wCal) / 2)    imgWhite[:, wGap:wCal + wGap] = imgResize

prediction, index = classifier.getPrediction(imgWhite, draw=False)

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        #print(prediction, index)

#print(labels[index])          if

keyboard.is_pressed('s') :

    str +=labels[index]

    cv2.putText(imgOutput, str, (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 0), 3)

if keyboard.is_pressed('a'):    str+=" "

    cv2.putText(imgOutput, str, (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 0), 3)

if keyboard.is_pressed('d'):

    str = str[:-1]

    cv2.putText(imgOutput, str, (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 0), 3)

if keyboard.is_pressed('w'):

    str=""

    cv2.putText(imgOutput, str, (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 0), 3)


else:

k = imgSize /

w

hCal =

math.ceil(k *

h)

imgResize =

cv2.resize(im

gCrop,

(imgSize,

hCal))

```

```

imgResizeSha
pe =
imgResize.sh
ape
hGap =
math.ceil((im
gSize - hCal) /
2)
imgWhite[hG
ap:hCal +
hGap, :] =
imgResize
prediction,
index =
classifier.get
Prediction(im
gWhite,
draw=False)

        #print(prediction, index)
#print(labels[index])            if
keyboard.is_pressed('s') :
        str += labels[index]                cv2.putText(imgOutput, str, (10, 30),
cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 0), 3)                if keyboard.is_pressed('a'):
        str += " "
        cv2.putText(imgOutput, str, (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 0), 3)
if keyboard.is_pressed('d'):                str = str[:-1]

```

```

        cv2.putText(imgOutput, str, (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 0), 3)

if keyboard.is_pressed('w'):

    str=""

    cv2.putText(imgOutput, str, (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 0), 3)


    cv2.rectangle(imgOutput, (x - offset, y - offset - 50),

                    (x - offset + 90, y - offset - 50 + 50), (255, 0, 255), cv2.FILLED)

    cv2.putText(imgOutput, labels[index], (x, y - 26), cv2.FONT_HERSHEY_COMPLEX, 1.7, (255,
255, 255), 2)        cv2.rectangle(imgOutput, (x -
offset, y - offset),

                    (x + w + offset, y + h + offset), (255, 0, 255), 4)
    cv2.putText(imgOutput, str, (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 0), 3)


ret,buffer=cv2.imencode('.jpg',imgOutput)

imgOutput=buffer.tobytes()


yield(b'--frame\r\n'        b'Content-Type:
image/jpeg\r\n\r\n' + imgOutput + b'\r\n')    return

render_template("index.html", pred=str)


@app.route('/predict',methods=['POST','GET']) def
predictions():

    return render_template("index.html", pred=str)

    # return generate_frames()


@app.route('/stop',methods=['POST','GET'])

def stopping():    count = 0    while True:

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```

        ## read the camera frame

success,frame=cap.read()


        if not success:

            return "The text is converted into voice.Restart the app again to start predicting.Thank
you!!!!!!!!!"

            break

        # if count==1:
        #     return "Exceeded"


        break
else:

    #cap.release()

    #print("The Recorded String is:", str)


    text2speech = pyttsx3.init()

newVoiceRate = 125

text2speech.setProperty('rate', newVoiceRate)

text2speech.say(str)

text2speech.runAndWait()        return

render_template('index.html')


@app.route('/') def

index():

    return render_template('index.html')

```

```
@app.route('/video') def
video():
    return Response(generate_frames(),mimetype='multipart/x-mixed-replace; boundary=frame')
#Team-Sajith,Stanley,Sachin,Harish

if __name__=="__main__":
app.run(debug=True)
```