VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI-590014

A Mini Project Report On

House Price prediction using Machine Learning

A Project report submitted in partial fulfillment of the requirements for the II Semester degree of
Bachelor of Engineering in Computer Science and Engineering(Artificial Intelligence)
of Visvesvaraya Technological University, Belagavi

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2023-2024

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ABSTRACT

The main objective of this project is to produce an algorithm for recognition of hand gestures with accuracy. In this project, a hand gloves model for gesture recognition is used.

INTRODUCTION

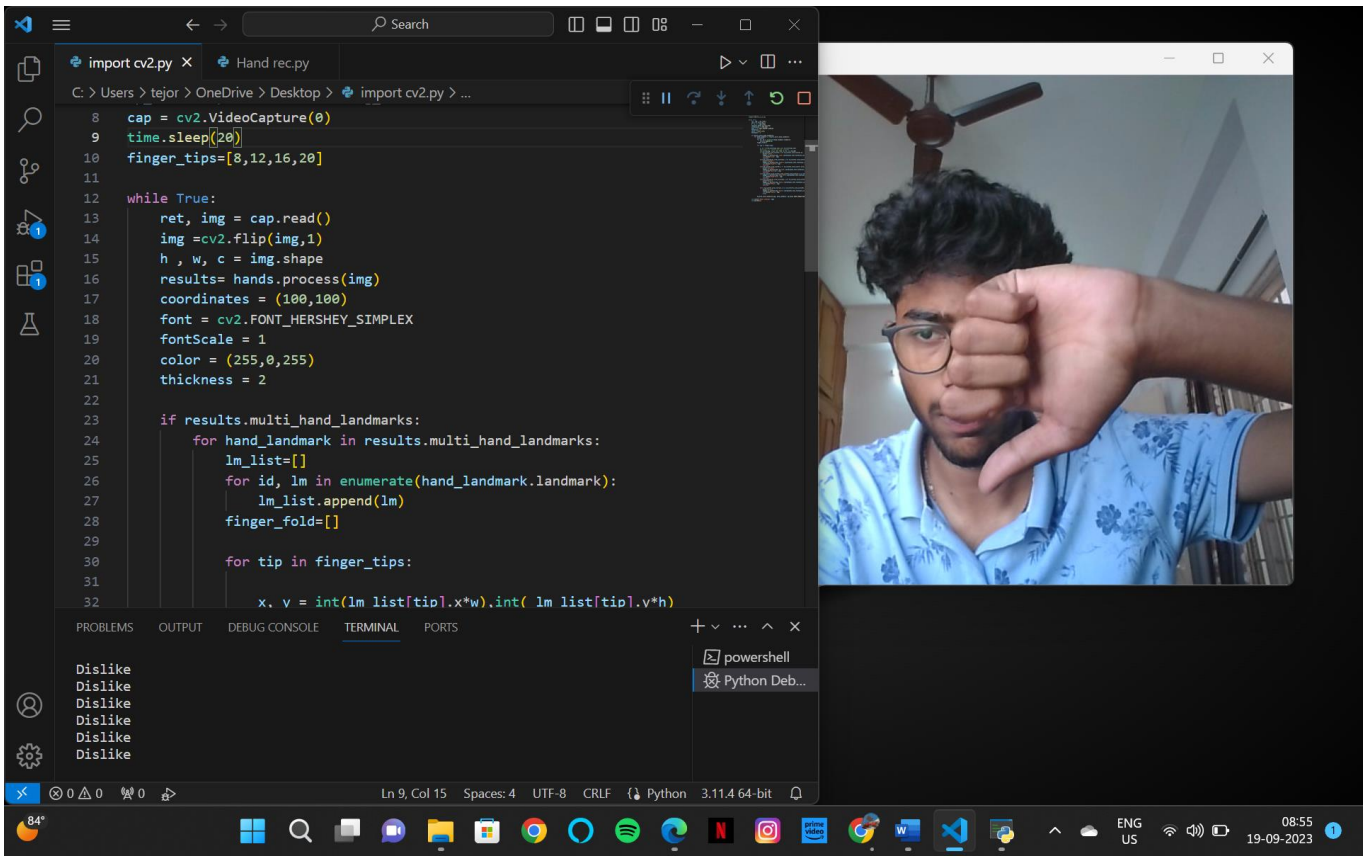
This system is designed to recognize a number of meaningful human expressions and has become a valuable and intuitive computer input technique. Hand gestures are one of the most intuitive and common forms of communication, and can communicate a wide range of meaning.

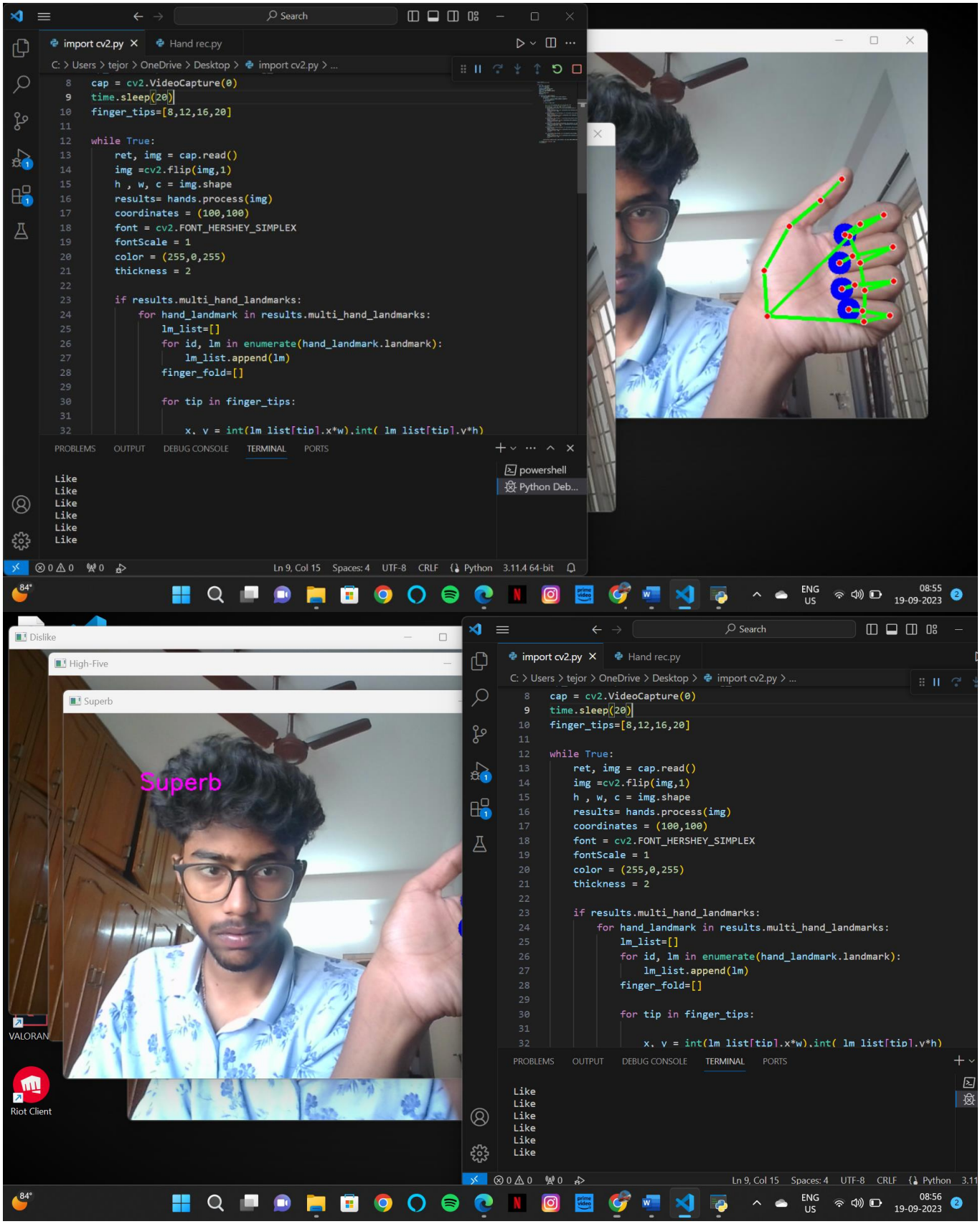
ALGORITHM

```
import cv2
# mediapipe provides the skeletal structure of hands
import mediapipe as mp
import time

mp_hands= mp.solutions.hands
hands = mp_hands.Hands()
mp_draw = mp.solutions.drawing_utils
cap = cv2.VideoCapture(0)
time.sleep(20)
finger_tips=[8,12,16,20]

while True:
    ret, img = cap.read()
    img =cv2.flip(img,1)
    h , w, c = img.shape
    results= hands.process(img)
    coordinates = (100,100)
    font = cv2.FONT_HERSHEY_SIMPLEX
    fontScale = 1
    color = (255,0,255)
    thickness = 2

    if results.multi_hand_landmarks:
        for hand_landmark in results.multi_hand_landmarks:
            lm_list=[]
            for id, lm in enumerate(hand_landmark.landmark):
```

```
                lm_list.append(lm)
            finger_fold=[]

            for tip in finger_tips:
                # we use coordinate geometry in order to find the coordinates of the
fingers
                x, y = int(lm_list[tip].x*w),int( lm_list[tip].y*h)
                #print(id, ":", int(lm.x*w),int( lm.y*h))
                cv2.circle(img, (x,y), 15, (255, 0, 0), cv2.FILLED)
                if (lm_list[20].x<lm_list[17].x and lm_list[16].x<lm_list[13].x and
lm_list[12].x<lm_list[9].x and lm_list[8].x<lm_list[5].x and
lm_list[4].y>lm_list[3].y>lm_list[2].y>lm_list[1].y):
                    print("Like")
                    '''image=cv2.putText(img,"Like",coordinates,font,fontScale,color,thi
ckness)
                    cv2.imshow("Like", img)'''
                    continue
                elif (lm_list[4].x==lm_list[8].x and
lm_list[12].y>lm_list[11].y>lm_list[10].y and lm_list[16].y>lm_list[15].y>lm_list[14].y
and lm_list[20].y>lm_list[19].y>lm_list[18].y ):
                    print("Superb")
                    '''image=cv2.putText(img,"Superb",coordinates,font,fontScale,color,t
hickness)
                    cv2.imshow("Superb", img)'''
                    continue
                elif(lm_list[4].x>lm_list[9].x and
lm_list[8].y>lm_list[7].y>lm_list[6].y and lm_list[12].y>lm_list[11].y>lm_list[10].y and
lm_list[16].y<lm_list[13].y and lm_list[20].y<lm_list[17].y ):
                    print("Peace")
                    '''image=cv2.putText(img,"Peace",coordinates,font,fontScale,color,th
ickness)
                    cv2.imshow("Peace", img)'''
                    continue
                elif(lm_list[8].y>lm_list[7].y>lm_list[6].y and
lm_list[20].y>lm_list[19].y>lm_list[18].y and
lm_list[4].y>lm_list[3].y>lm_list[2].y>lm_list[1].y and lm_list[16].y<lm_list[13].y and
lm_list[12].y<lm_list[9].y):
                    print("Rock")
                    '''image=cv2.putText(img,"Rock",coordinates,font,fontScale,color,thi
ckness)
                    cv2.imshow("Rock", img)'''
                    continue
                elif(lm_list[20].x>lm_list[17].x and lm_list[16].x>lm_list[13].x and
lm_list[12].x>lm_list[9].x and lm_list[8].x>lm_list[5].x and
lm_list[4].y<lm_list[3].y<lm_list[2].y<lm_list[1].y):
                    print("Dislike")
                    '''image=cv2.putText(img,"Dislike",coordinates,font,fontScale,color,
thickness)
                    cv2.imshow("Dislike", img)'''
                    continue
```

```
                elif(lm_list[20].y<lm_list[17].y and lm_list[16].y<lm_list[13].y and
lm_list[12].y<lm_list[9].y and lm_list[8].y>lm_list[7].y>lm_list[6].y>lm_list[5].y and
lm_list[4].x>lm_list[3].x>lm_list[2].x>lm_list[1].x):
                    print("Smile")
                    '''image=cv2.putText(img,"Smile",coordinates,font,fontScale,color,th
ickness)
                    cv2.imshow("Smile", img)'''
                    break

            mp_draw.draw_landmarks(img, hand_landmark, mp_hands.HAND_CONNECTIONS,
mp_draw.DrawingSpec((0,0,255),2,2), mp_draw.DrawingSpec((0,255, 0), 4,2))

    cv2.imshow("Hand Tracking", img)
    cv2.waitKey(1)
```




import cv2.py
Hand rec.py
C: > Users > tejor > OneDrive > Desktop > import cv2.py > ...
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lm_list=[]
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lm_list.append(lm)
finger_fold=[]
for tip in finger_tips:
x, y = int(lm list[tip].x*w),int(lm list[tip].y*h)
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
powershell
Python Deb...
Like
Like
Like
Like
Like
Like
Ln 9, Col 15
Spaces: 4
UTF-8
CRLF
Python
3.11.4 64-bit
Dislike
High-Five
Superb
Superb
VALORAN
Riot Client
ENG
US
08:55
19-09-2023
08:56
19-09-2023

CONCLUSION

The review shows that the vision-based hand gesture recognition research is an active field of research, with many studies conducted, resulting in dozens of articles published annually in journals and conference proceedings. Most of the articles focus on three critical aspects of the vision-based hand gesture recognition system, namely: data acquisition, data environment, and hand gesture representation.

REFERENCES

I found a paper that reviewed the sign language research in the vision-based hand gesture recognition system from 2014 to 2020 [1]. The review shows that the vision-based hand gesture recognition research is an active field of research, with many studies conducted, resulting in dozens of articles published annually in journals and conference proceedings. Most of the articles focus on three critical aspects of the vision-based hand gesture recognition system, namely: data acquisition, data environment, and hand gesture representation. The review also shows that the signer dependent recognition accuracy ranges from 69% to 98%, with an average of 88.8% among the selected studies. On the other hand, the signer independent's recognition accuracy reported in the selected studies ranges from 48% to 97%, with an average recognition accuracy of 78.2%. The lack of progress in continuous gesture recognition could indicate that more work is needed towards a practical vision-based gesture recognition system [12].