

# Realtime Sign Language Recognition

User Manual

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# Acknowledgements

A small vote of thanks for all who have helped me in this journey of App Development –

- ▶ Mr. Ken Kahn and mentors
- ▶ Sites stackoverflow and geesforgeeks for solving my endless doubts!
- ▶ My parents, for being with me all the way
- ▶ Myself, for not giving up even if there were some rocky patches!

# About Me!



- ▶ Hi! I'm Ira Karmarkar, currently in 9<sup>th</sup> and studying in Pune, India. My hobbies include painting, poetry, reading books, music and AI/ML through robotics.

# About My Internship Journey with Clevered..

- My Internship journey, has for the most part been absolutely fantastic and at times exhausting. Keeping up with the AI project and school work side by side has been no easy feat! Debugging takes time too, so I was worried about having an incomplete project, but it all came together in the end.

# About App..

## ► App's Introduction

Welcome to the Sign Language Recognition App!

This app is able to detect only American Sign Language (ASL) alphabet. It cannot detect words.

Even though it can only detect alphabets, I believe it is a step towards developing and improving the needs of the disabled, and a step towards being an inclusive community.

A lot of work has gone into this app – I hope you enjoy it!

## ► App's Main Menu

This app consists of a single menu – A screen which holds a button you can click to start detecting!

It's made in a simple way on purpose – so that people don't have trouble navigating the interface.

You need to do very little to operate the app. Just make sure to go through this manual.

Have fun with the app!

# How do I use the App?

- ▶ The next few slides will elaborate on the inner workings and know-how of the app!

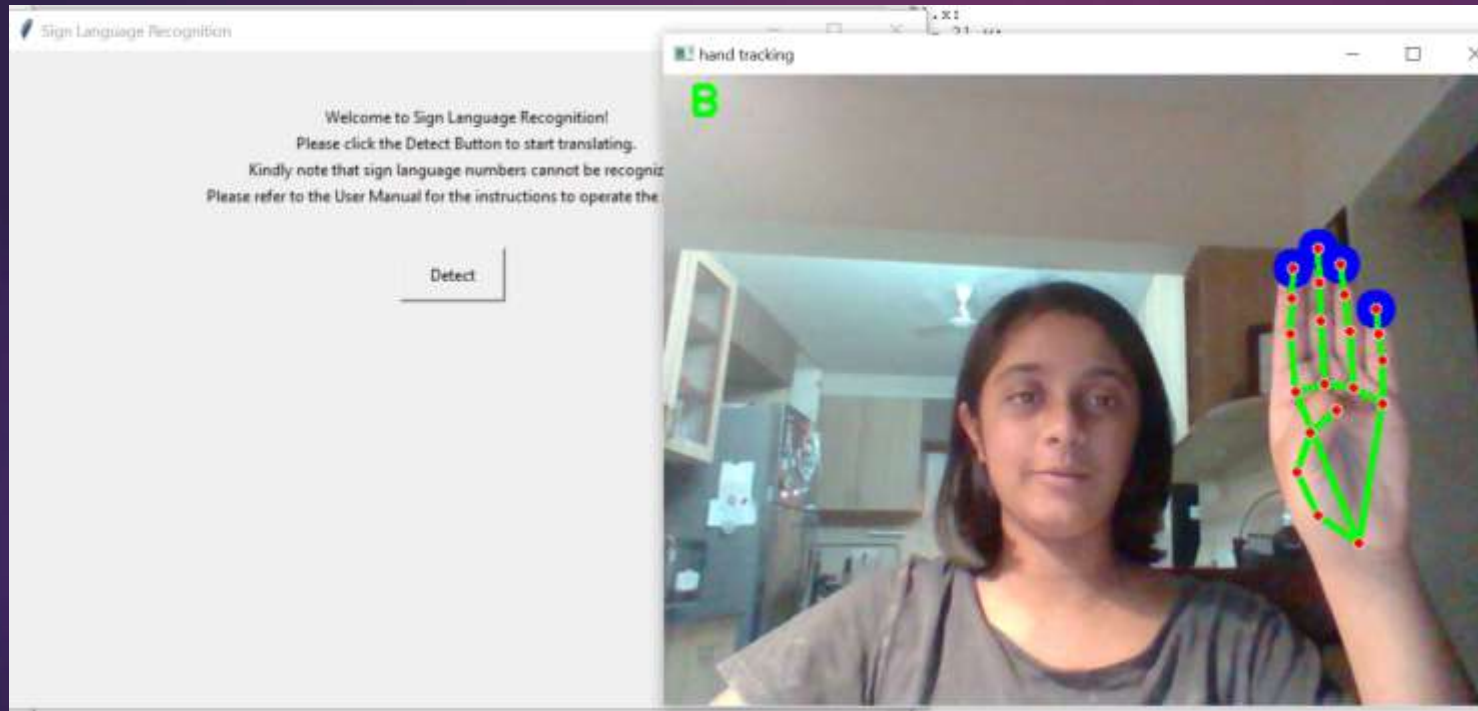
# Features

► Press the Detect button.





# Features



- ▶ The computer's webcam will open.
- ▶ Arrange your fingers/palm of the hand in the positions of the letters as provided in the slides after the 'Features' section.
- ▶ Please use only your right hand to sign.

Please watch the below video for further clarification.

# Features

```
Run... Customized Shift+F5
Check Module Alt+X
Python Shell

== False and finger_fold_GH[1] == False and finger_fold_GH[2] == False and finger_fold_GH[3] == False:
    tip].x < lm_list[thumb_tip - 1].x < lm_list[thumb_tip - 2].x:
        lm_list[pinky_tip].y < lm_list[pinky_tip - 1].y < lm_list[pinky_tip - 2].y:
            cv2.putText(img, 'C', (20, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (0, 255, 0), 3)
        if lm_list[middle_tip].y > lm_list[middle_tip - 1].y > lm_list[middle_tip - 2].y:
            cv2.putText(img, 'O', (20, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (0, 255, 0), 3)

    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))

    imshow('hand tracking', img)
    cv2.waitKey(1) == ord('q'):
        break

    con(win, text = 'Detect', width = 10, height = 2, command = clicked)

    800, y=150)

    ()
```

- ▶ After finishing, please press the 'Q' key on your laptop keyboard. The webcam will freeze. (At about 22 seconds in the video, you can see my video feed freeze. This is when I pressed the 'Q' key.)
- ▶ After that, please close the webcam window.

# Disclaimer!

- ▶ I have not learnt any form of Sign Language professionally, and neither do I know ASL beyond the alphabet. Because of this, if you find anything lacking, any inconsistencies and/or mistakes either in the alphabet photos below, the recognition or the app itself, please do not hesitate to contact me.

\*Please note that all the signs have been done by the right hand.

# How do I sign in Sign Language?

A



C



E



G



B



D



F



H



\*Please note that all the signs have been done by the right hand.

# How do I sign in Sign Language?

I



L



N



P



K



M



O



Q





\*Please note that all the signs have been done by the right hand.

# How do I sign in Sign Language?

R



T



V



X



S



U



W



Y



# Some More Pointers

- ▶ Kindly note that Sign Language numbers cannot be detected, and the numbers will most likely be detected as a similar letter if you sign a number.
- ▶ Currently, the app can only detect ASL (American Sign Language). Any other language such as JSL or ISL will not be recognized.
- ▶ The app can only recognize alphabets and not words.
- ▶ Please sign using only your right hand.
- ▶ When you sign, make sure only the right hand is visible, and that you are sitting in a place where clear difference between your hand and the background is visible.
- ▶ Take care that you are not sitting in a place where it is too bright or too dark.
- ▶ To close the App, press the 'Q' button on the keyboard and when the video feed freezes, please close the video feed and the app interface.

# Contact Info

- ▶ Kindly reach out to this email:  
[ira.karmarkar@gmail.com](mailto:ira.karmarkar@gmail.com)  
for suggestions, constructive  
criticism, and/or feedback!



Thank you!