



Hands UP

User Manual

updated: 15/08/2025

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1 Introduction

Hands UP is an innovative application that bridges the communication gap between signers and non-signers. Using advanced AI technology, the application detects and translates sign language in real-time through the device's camera, converting signs into both text and spoken language without significant delays. Beyond translation, it also serves as an interactive learning platform with structured lessons and feedback on signing accuracy.

1.1 Who Needs Hands UP?

Hands UP is intended to be used in conversations between people who can sign and those who cannot sign. It bridges the communication gap by translating what is being signed into English and saying it out loud. Furthermore, Hands UP can be used by those looking to learn sign language. Our intuitive curriculum allows users of all skills to either get started, touch up their skills or become a pro at sign language.

1.2 Key Features of Hands UP

- Gesture recognition
- High translation accuracy
- Text-to-Speech
- Intuitive learning interface
- Educational game

2 Technical Specification

| Component | Specification |
|-----------------------|---|
| Gesture Recognition | Mediapipe |
| AI inferencing | CNN, LSTMs in TensorFlow and OpenAI API |
| Text to Speech | React SpeechSynthesis API |
| Models and Animations | Mixamo, Sketchfab and Blender |

3 System Requirements

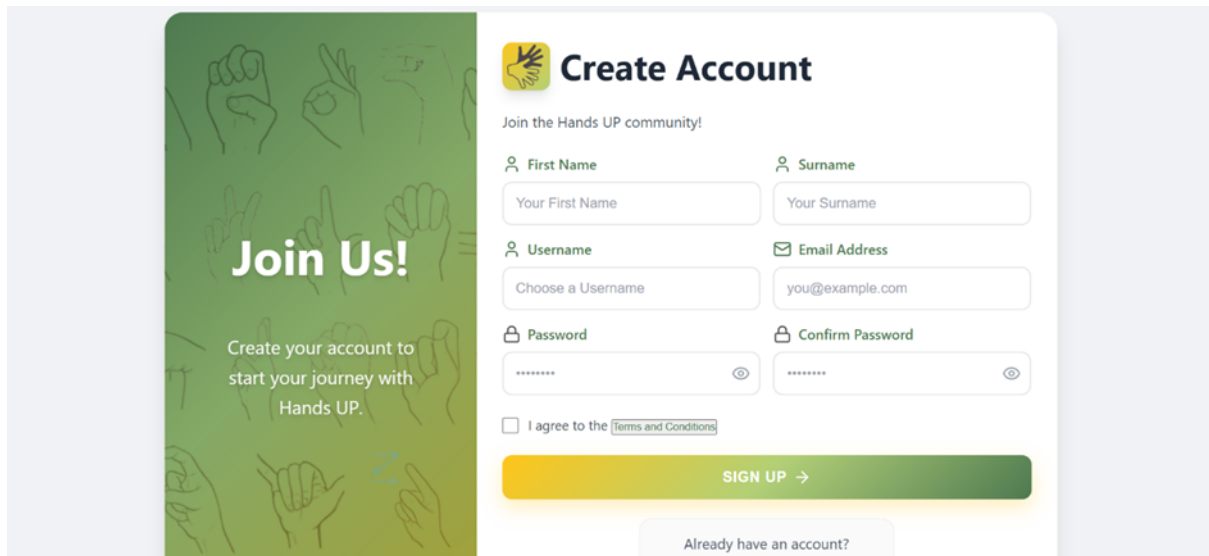
Minimum Requirements:

- Operating System: Windows 10/11, macOS 12+, Linux (Ubuntu 22.04+)
- Processor: Intel i5 or equivalent
- RAM: 8 GB
- Camera: 720p webcam or higher
- Internet Access

4 Getting Started

4.1 Start The App

1. Go to www.handsup.onrender.com
2. **Sign up** (or Login if you're a returning user) create a new account with your personal details. The signup page will look as follows.



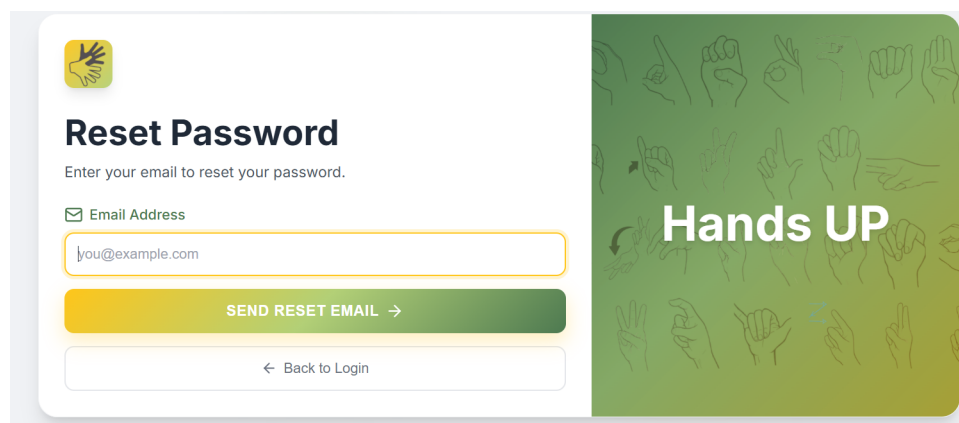
The screenshot shows the 'Create Account' page for Hands UP. On the left, a green banner with hand icons says 'Join Us!' and 'Create your account to start your journey with Hands UP.' The right side contains a form with the following fields: First Name, Surname, Username, Email Address, Password, and Confirm Password. There is a checkbox for 'I agree to the Terms and Conditions' and a 'SIGN UP' button. A link for 'Already have an account?' is at the bottom.

Figure 1: Hands UP sign up page

You will need to accept the terms and conditions to continue, see more here [Terms And Conditions](#)).

4.1.1 Forgotten Password

If you are a returning user and forgot your password, click on **Forgot Password** on the login page to be redirected to the password reset page.



The screenshot shows the 'Reset Password' page for Hands UP. On the left, a white form with the title 'Reset Password' contains an 'Email Address' field with the placeholder 'you@example.com'. Below the field is a 'SEND RESET EMAIL' button and a 'Back to Login' link. The right side of the page features a green banner with hand icons and the text 'Hands UP'.

Figure 2: Password reset

4.2 App Navigation

Different pages of the app can be accessed through the navigation bar at the top right of your screen.

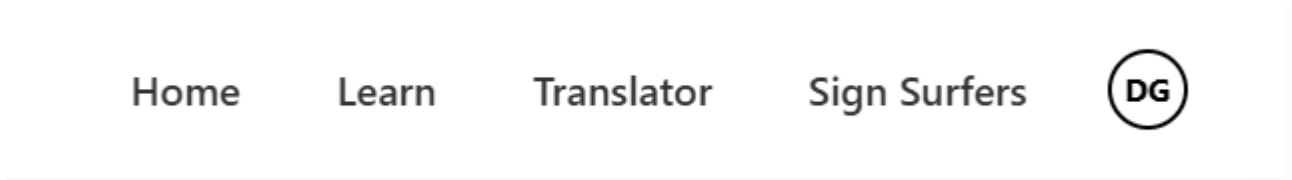


Figure 3: Navigation bar

4.3 Camera Access

Hands UP requires camera access, as such you will be prompted to grant camera access on the translate page (through the navigation bar).

1. **Grant camera access** when prompted (“Allow while visiting this app” or “Allow this time”).

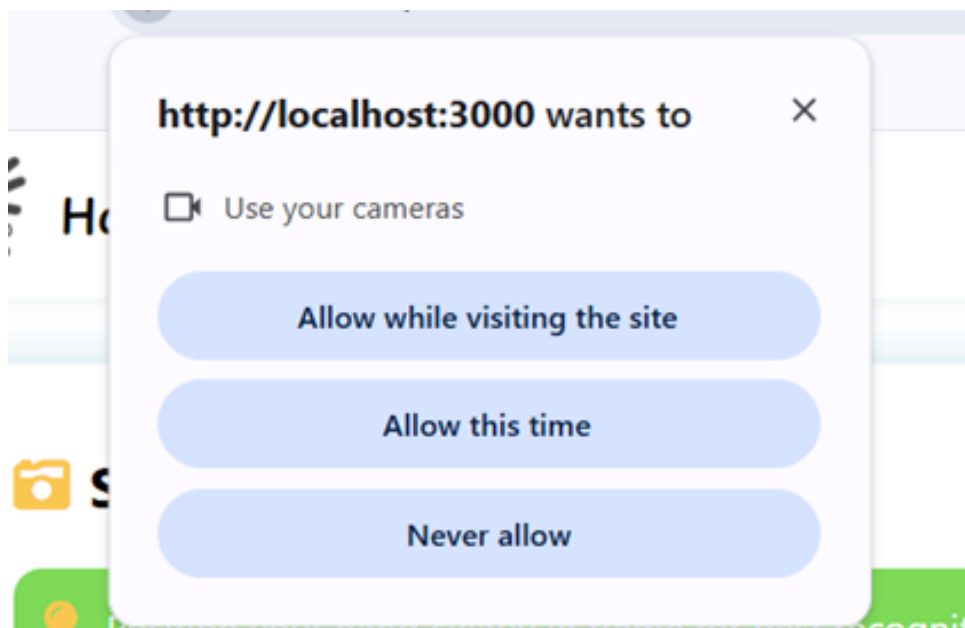


Figure 4: Camera access prompt

4.4 Gesture Recognition

To begin translating, do the following:

1. Navigate to the translate page via the navigation bar. Ensure that you are in proper lighting where all your fingers and your upper body are visible.
2. Take note of the additional tips given for the best results.
3. Click the **green** “Start Signing” button and immediately start – the button will turn white. Click again to stop signing.

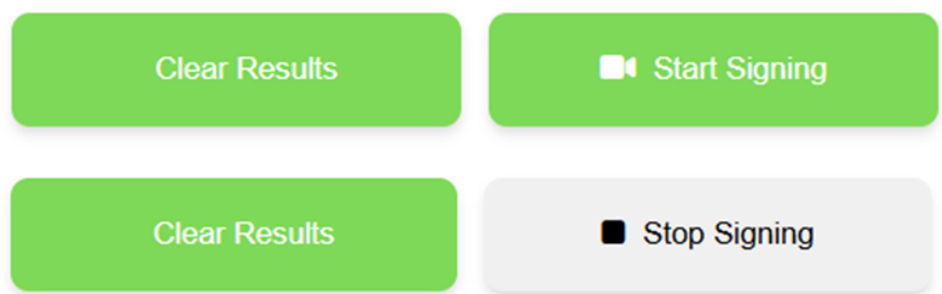


Figure 5: Before and after clicking the button

4. To the right of your screen will be a feedback image of the last frame captured before processing the latest signed sequence, below it is where the translation will appear.
5. Click on the sound icon to hear the outputted translation.

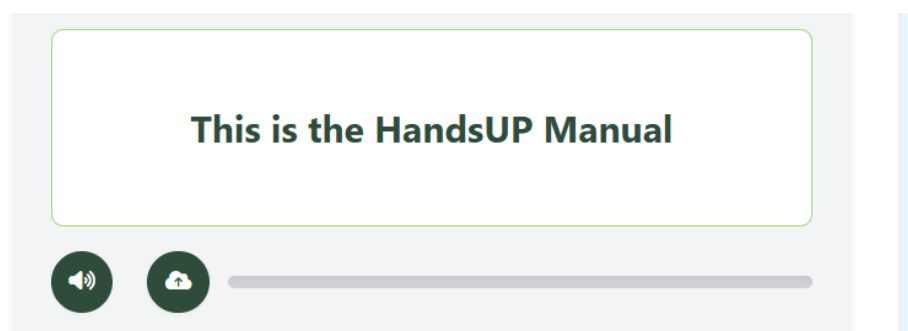


Figure 6: Sound Icon

4.5 Learning Signs

To begin learning sign language, do the following:

1. Navigate to the learn page and select a category to learn.
2. Follow along with the animation, ensuring that your finger, hand and arm placements align with that of the animation.

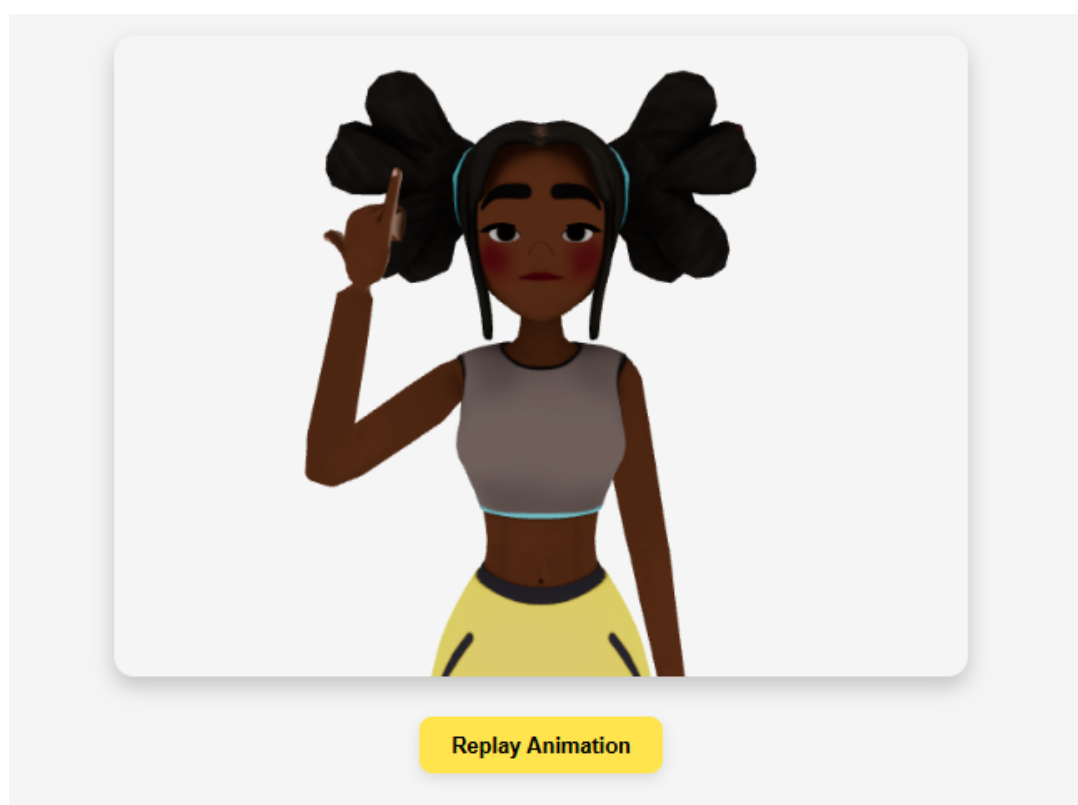


Figure 7: Sign animation

3. Replay the animation if necessary.
4. Move along the signs using the arrows on the left and right sides of the screen or by going back to the category page and choosing a different sign to learn.
5. At the end of each category there will be a quiz to test how well you have learned the signs. Answer it according to receive a score out of 5.

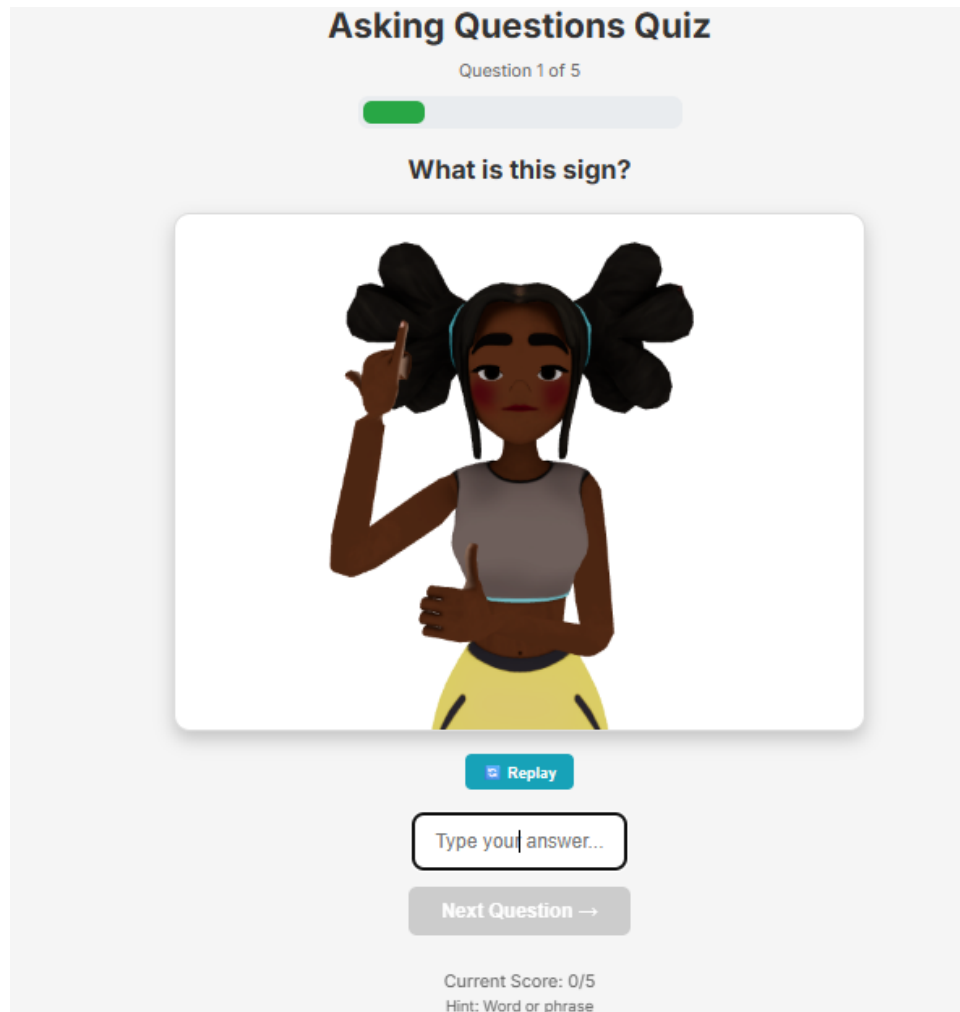


Figure 8: Quiz

5 Sign Surfers

5.1 Playing The Game

1. Click on START to begin the game.

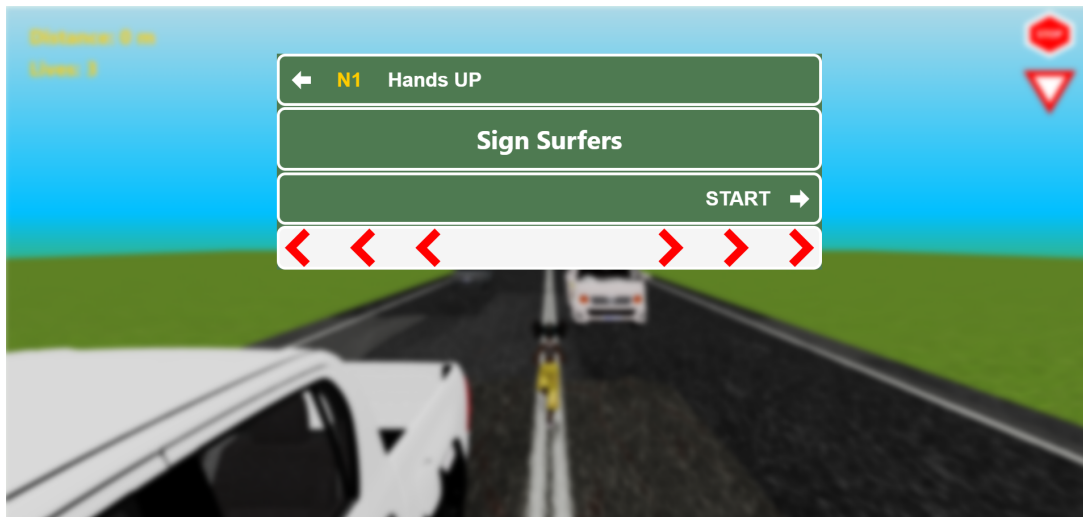


Figure 9: Sign Surfers start screen

2. To move the character, use the arrow keys (laptop) or swipe (mobile device). Up is to make the player jump, left move them to the left, down makes them duck and right moves them over to the right.



Figure 10: Sign Surfers in action

1. To pause, press the yield sign(upside down triangle) and to stop, press the stop sign on the top right of the screen.



Figure 11: Pause and Stop buttons

6 Settings and Customisation

You can update details such as your name, username, email and password. Additionally, you can customise your profile by adding a picture.

6.1 Changing Your Details

1. Navigate to your profile by clicking the circle with your initials in the navigation bar. It should look like the picture below.

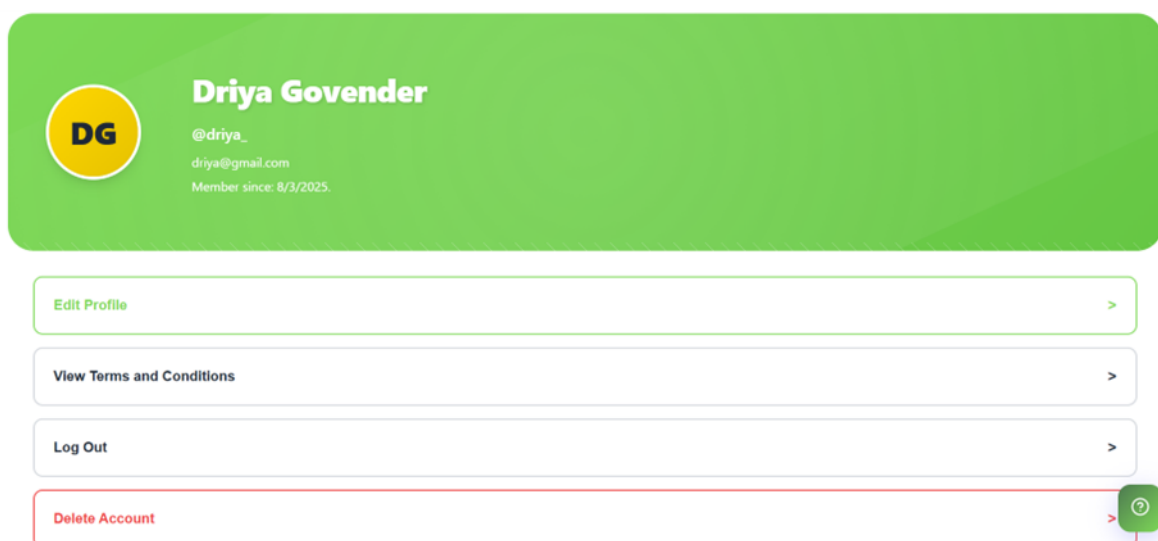


Figure 12: Profile page

2. Click on **Edit Profile** and the popup below will appear. After making your changes, ensure that you press **Save Changes**.

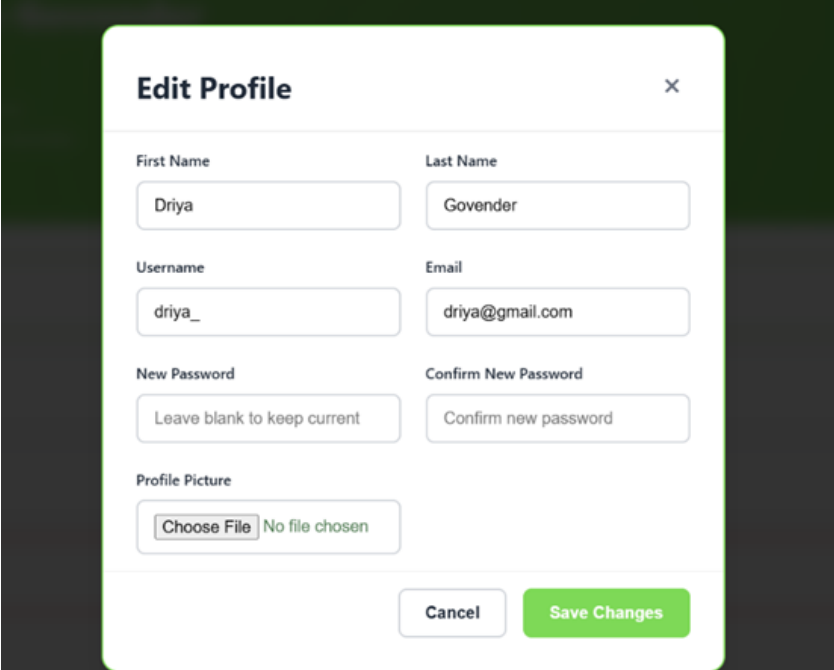
A screenshot of an 'Edit Profile' popup form. The form is white with a green border and a close button (X) in the top right corner. It contains several input fields: 'First Name' with the value 'Driya', 'Last Name' with 'Govender', 'Username' with 'driya_', and 'Email' with 'driya@gmail.com'. There are also fields for 'New Password' (containing the text 'Leave blank to keep current') and 'Confirm New Password' (containing 'Confirm new password'). At the bottom, there is a 'Profile Picture' section with a 'Choose File' button and the text 'No file chosen'. At the very bottom of the form are two buttons: 'Cancel' and 'Save Changes'.

Figure 13: Edit details popup

6.2 Terms And Conditions

On this page you can also read our terms and conditions if you need a refresher.

6.3 Deleting Your Account

To delete your account, click on the **Delete Account** tab. You will be asked to confirm deletion, thereafter you will be redirected to the login page.

7 Troubleshooting

7.1 Camera Access

Should you need to grant camera access when the popup has disappeared, follow these steps:

1. In your search bar, click on the circle to the left of the URL

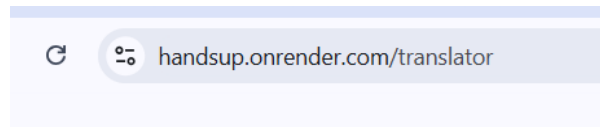


Figure 14: Search bar

2. Here you can click on the camera access toggle and then refresh for your changes to be applied.

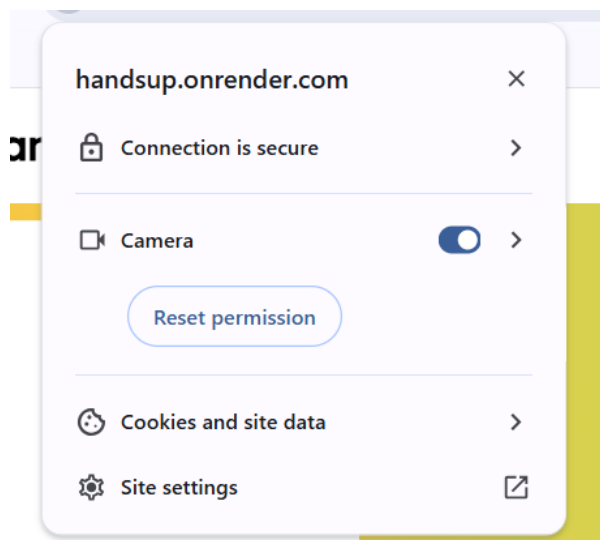


Figure 15: Camera permission toggle

7.2 Text Output To Speech

If you are unable to hear the translation provided in the results section , do the following:

1. Ensure that your device is not on mute. Increase the volume to max to ensure that it is not too low to be heard.
2. Try opening the web app in a different browser. Try Google Chrome, Microsoft Edge, Apple Safari and Firefox.

Should you still have issues after trying these, see the next section of this manual.

8 Contact and Support

8.1 In-app Help Menu

For quick issue looks ups, a help menu can be accessed from every page on the app.

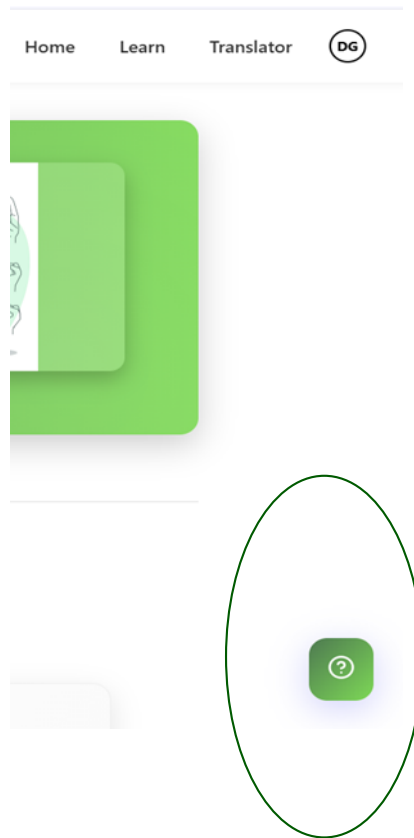


Figure 16: Help menu

After clicking on the icon, the popup below will appear. Assistance can be found per topic so check the one that you are interested in. You can also use the search bar to find what you are looking for.

In the Help Center you can also find FAQs.

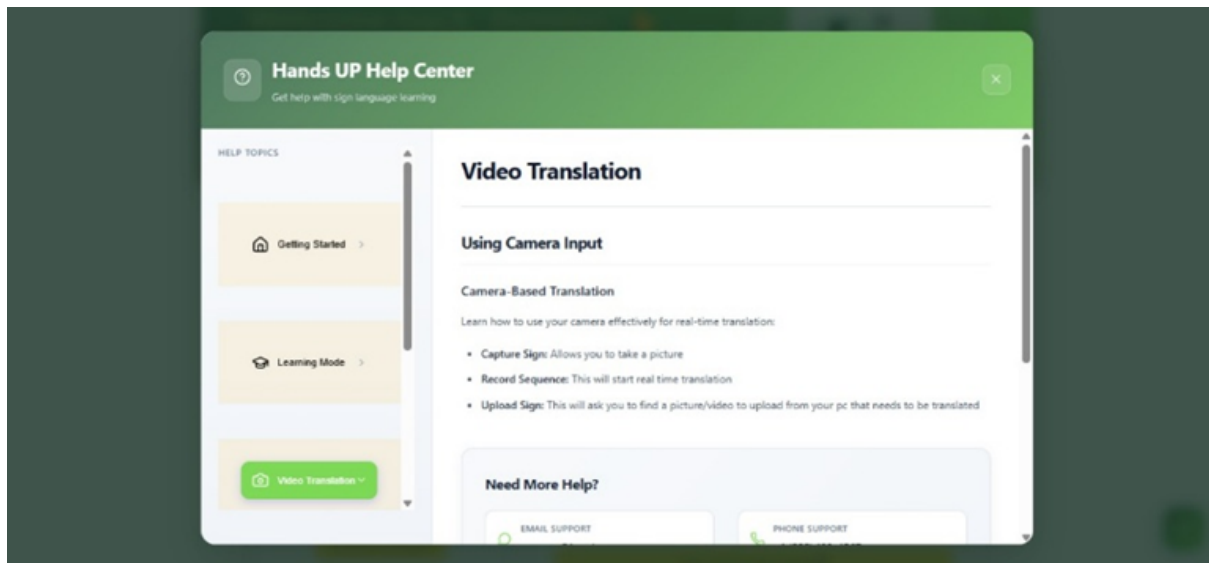


Figure 17: Help menu popup

8.2 Additional Support

If this manual and the help menu do not assist in fixing any issue you have or you would like to ask about something else, please contact us here:

tmkdt.cos301@gmail.com or
Driya Govender: 071 613 4265