

Sign Language Recognition

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Project Summary

The aim of the project was to recognise sign language and display the output on screen via text and speech. We used mediapipe framework for detection of landmarks of Hand, face and body posture. For data collection, we used opencv to access the camera and capture video. From the video, the landmarks of Hand, Face and body will be extracted and converted to a numpy array. This Process will be done for all signs and each sign will have 30 videos with 30 frames each. We used Tensorflow.keras library for our LSTM model.

At First we tried working with few signs to check if we are getting required output or not. Then we tried to add more signs but we faced the issue of less accuracy in training the model. After suggestions from Parmar Sir, we collected the real-world Indian Signs which are commonly used and made the dataset by capturing separate video for all of them and then labelled them. The new dataset consists of signs: 'Thank You', 'Welcome', 'Good Night', 'Hello', 'Skill', 'Draw', 'Play', 'Computer', 'Clock', 'Afternoon', 'Kids', 'Chair', 'Exercise', 'Travel', 'Black', 'Blue'.

After training the new dataset with the same LSTM model which we used previously, we didn't get much accuracy and it was around 20 – 30 % only so we changed some parameters like batch size, test and train size, layers in model, optimizers, activation functions, etc. After running it for 500 epochs, we saw that the model was overfitting so we stopped and made changes in epoch and made it to 200. At last, we got accuracy of 91%. We saved the weights of this model into a file named 'IndHandSigns.h5'.

For real time recognition of signs, we again used opencv and passed the landmarks that are detected into predict function so we can get which sign is made by user. We had threshold value of 0.7 for more precise output. The sign that is predicted will be shown at top and also, we converted this text to speech using pyttsx3 library.

