Indian Sign Language Translation

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Problem Statement

To build a Indian Sign Language Translator i.e to convert the signs shown by a person in a video to a meaningful caption.
Such a model is very useful when integrated with a mobile app. This not only helps the deaf-dumb people but also the people who interact with them
The model must be robust to variations in video quality, variations in lightning, distance from the camera to the subject and camera angle

Background

- No proper dictionary of sorts is available to guide
- No models trained on Indian Sign language
- Only few datasets available with vast training data and categories

Dataset and Features / Project Requirements / Product Features

DATASET:-
- INCLUDE Dataset

PROJECT REQUIREMENTS:-
- A user with internet and a video.
- Python 3.8
- Flask
- MongoDb
- Tensorflow 2.x

Product Features:-
- Generate Captions from Video
- Generate Video from Caption

Design Approach / Methods

- For Caption to Video, the video is taken as a input.
- The video is processed using Open pose Pre-processing.
- The frames are extracted next and transformer embeddings are taken out of this page
- The embeddings are then given as a input to our model and a word is generated.

Results and Discussion

Results:
- We are able to obtain the result of a single word caption. And are also able to provide a video for a caption

Discussion:-
- We wanted to create a Android App but due to the integration constraints and

Summary of Project Outcome

- A front end and a model were prepared and integration was done.
- The Video provided captions with single word output

Conclusions and Future Work

- We really are looking forward to working on improving the services provided in the App. We plan to simultaneously generate captions for the signs so that the process would appeal to more real time usage. Also instead of using stick figures for converting the captions to video we would like to use GAN's to generate an artificial human so that it would be more appealing to the end users.

References

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[2] Parton, Becky. (2006). Sign Language Recognition and Translation: A Multidisciplined Approach From the Field of Artificial Intelligence. Journal of deaf studies and deaf education. 11. 94-101. 10.1093/deafed/enj003.