**Review on paper:** Sign language Recognition Using Machine Learning Algorithm - 2020

**Abstract:**

This paper works on adding a new and easy way to recognize ISL (Indian Sign Language). Due to there being lack of resources and the learning process being inconvenient, they extended a new step in this field by working on existing datasets and using various feature extraction techniques. Then they used 4-fold cross validation to further improve their model, differentiating it from existing work. Additionally, they also used photos of a different person for validation test in correspondence to training set to further differentiate their work

**Introduction:**

There are around 466 million deaf people in the world and 36 million of them are children. They need use sign language. The writers of this papers worked on the Indian Sign Language or ISL for this paper. Since very few people in India, they wanted to improve accessibility of ISL by providing a better recognition model, not just for deaf people but also for the interpreters and those who wish to learn. Since any sophisticated hardware implementation is not economical, they wanted to implement state of the art machine learning and computer vision to decrease cost and make their work further more accessible.

**Literature Review:**

In this research they’ve used various supervised learning models on their extracted features. They then used 4 fold cross validation where the validation set and testing set were pictures of different people to further improve their accuracy. They used two handed ISL dataset for this project. They used the Dataset from UCI. They didn’t review any literature related to their work.

**Methods:**

They divided the classification problem into three stages after getting their dataset. The first stage was segmenting the skin portion of the image from the rest and disregarding the rest of the image as noise. The dataset from UCI had about 200,000 points for this stage. They used algorithms like SVM and Random Forest for this stage. Then they used Scale Inverse Feature Transform or SIFT for higher efficiency feature extraction. They used YUV-YIQ model for obtaining skin segmented images. To extract the features they used machine learning of feature vectors, particularly, Multi Class Support Vector Machines or SVM and Random Forest. And then, they applied 4 Fold Cross Validation on both of them. They found that Multi Class SVM had better accuracy.

For image recognition, they divided the process into three parts. The first part was capturing the image using a webcam or a different camera. Then the second step used image processing to turn the RGB image into a binary image, as well as using image enhancement, cropping and Image Segmentation Methods. Additionally they used edge detection to remove the unwanted, noise part of the image. Then they used feature extraction methods on the processed image to match with the feature database and show the alphabet it matched with.

**Results:**

They split the dataset into 30 % and 70% for testing set and training set respectively. They reversed this arrangement to be 70% and 30% for testing and training. After both cases they used KNN classifier. They found accuracy of 100% in their proposed method.

**Discussion:**

In comparison to our work, the author of this paper had similar motivation, as there is a lack of resources for Bangla Sign Language. However, we used our own custom CNN model and Bangla Dataset in contrast to their work. We achieved over 99.50% accuracy while they achieved 100% accuracy. We tested our model using the previously mentioned CNN model, VGG16 and ResNet 18 models in contrast to their training models. And our aim isn’t just to do image recognition but rather comparison between ASL to English to Bangla and BSL to Bangla text translation.

**Conclusion:**

In this work, the authors made and automatic image recognition system in real time using various tools. According to the authors, although their proposed work is expected to recognize and translate sign language in real time, there are still scopes for improvement in the future.

**Reference:**

URL for the Paper:

https://www.irjet.net/archives/V7/i3/IRJET-V7I3418.pdf