**Abstract**

American Sign Language ASL is the most prominently used sign language and recent advances in CNN have improved the accuracy of recognizing hand signs. This document is a review of a similar research paper by the title “A New Benchmark on American Sign Language Recognition using Convolutional Neural Network” that was proposed in the year 2019.

**Introduction**

Convolutional neural networks are one of the most popular deep learning algorithms that are used to provide the state of the art accuracy in the field of computer vision, speech recognition, and medical image analysis and so on. There have been many proposed systems for recognizing sign languages but they are not commercially available. So the researchers of the paper have used a publicly available ASL datasets that were used to built similar systems and compare their proposed architecture with the other.

**Literature Review**

In this research they have created a custom convolutional neural network called SLRNet-8 for recognitions of ASL and for evaluated its performance. The have originally stated that they used four different datasets but they have provided the results of only using The Massey University dataset and the digits dataset.

**Methods**

In the preprocessing step the raw images were first transformed into grayscale. Then it was normalized by the maximum value of the gray level range and then resized it to 64x64 pixels. The lower resolution was to ensure faster training. The convoultional model SLRNet-8 consists of 6 convolutional layers, three pooling layers and a fully connected layer. They have experimented using different kernel sizes from 32 to 512 at different step size and they finally selected a combination that gave the highest accuracy. They have also used batch normalization layer for accelerating the training process. They have used ReLU activation fuction. The max pooling layers were used with stride 2. They have also used a global average pooling layer that’s takes the average instead of the maximum of a max pooling layer which drastically reduces the tensor to the size of 1x1xdepth. Finally they have used a fully connected layer, dropout layer and an output layer. They have also used data augmentation techniques such as zooming 10%, shifting 10% on height and width. These parameters were chosen by trail and error to get the highest accuracy possible. For training they have used Adam optimizer with learining rate 0.001 for 200 epochs.

**Results**

The accuracy of the model reached to almost 100 % for the MU dataset and the lowest accuracy was for the digits dataset which was 99.90%. They have also tested by using the model for both the hand signs and digits combined and got a reduced accuracy of 99.92% from approximately 100%. They have compared their result with previously proposed CNN models and they have achieved >=9% accuracy than previous research using this methods on the same dataset.

**Discussion**

In their research they have pointed out that one of the reasons of getting such high accuracy is using enough data augmentation for training because it adds variation in training which makes the model train better. So for our project we should also use data augmenting to improve training to get a higher accuracy.

**Conclusion**

In this research they have developed a CNN model which is not only simpler but also faster and provides a higher accuracy then preciously proposed CNN models. They have achieved an accuracy of approximately 100% using their custom CNN model and using techniques to improve the quality of the training.