# Sign Language Recognition and Transcription with Neural Networks

https://youtu.be/-8v7P1juNuw

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## Motivation

Sign Language helps people from the deaf community to connect with other people and communicate their thoughts. Although a fair number of people can communicate with sign language, inability to communicate with someone in times of emergency is a big problem. This report presents a Convolutional Neural Network trained on the Sign Language MNIST [1] Dataset with a Train and Test accuracy of 92%.

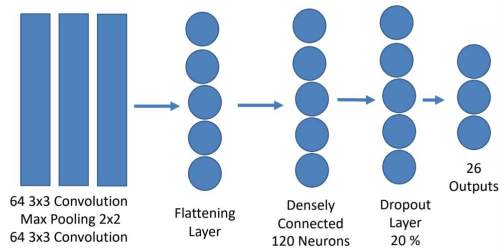
## Dataset and Features

Sign Language MNIST Dataset [1] used from Kaggle.

- 24 target classes from representing letters A-Z except J and Z as they require motion
- 27455 & 7172 Samples for Training and Test.
- Each sample is a 28 x 28, single color channel image.

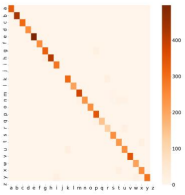
**Input: 28x28 Pixel Image**
**Output: Recognized Pattern**

## Model Architecture



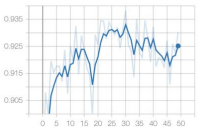

## Results

Training Accuracy: 99.92 %
Validation Accuracy: 96.19 %



Confusion Matrix
Real vs Predocted

Epoch vs Training Accuracy



Epoch vs Validation Accuracy

## Discussion

The model built as part of this project was able to achieve a training accuracy of 99.92% and a validation accuracy of 96.19% when run for 50 epochs. Although the model achieved promising performance numbers, it over-fit the training dataset and could not generalize well on examples and videos outside the dataset. This resulted in the transcription objective of this project to remain unexplored.

The results were not good because of the following reasons:

- Not generalizable for real world converations.
- Low Dimensional Nature of the Dataset.
- Dataset biased to a single ASL Signer.

## References

[1] tecperson on Kaggle. "Sign Language MNIST"
https://www.kaggle.com/datamunge/sign-language-mnist