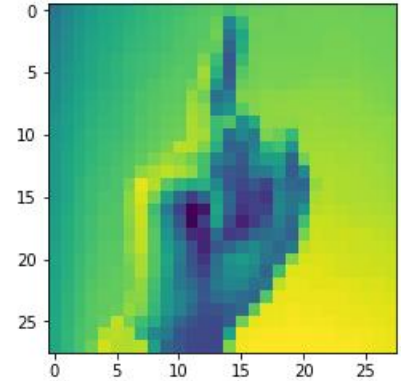


# Sign Language Recognition using CNN

## Abstract:

There are approximately 70 million people, who are hearing and speech impaired. Static hand gestures are the most essential facets of gesture recognition. Hand Gesture Recognition, a person instructs the machine using his bare hands, whereas images of the persons hand gestures are captured and analyzed in order to determine the meaning of the hand gesture. The project uses image processing to detect the gestures accurately up to 87%.



The Sign Language MNIST data came from greatly extending the small number (1704) of the color images included as not cropped around the hand region of interest. To create new data, an image pipeline was used based on ImageMagick and included cropping to hands-only, gray-scaling, resizing, and then creating at least 50+ variations to enlarge the quantity.

The CNN model works on two hidden layers with two fully connected dense layers, hyper parameters like learning rate, dropout rate, momentum, activation function, optimizer and number of neurons have been tuned to reach optimum stability and accuracy in the model.

Sign language recognition can be applied to

- Apps that can facilitate direct feed conversion of sign language to letters/ sounds. (Human Computer Interface)
- Emergency First Responders
- Gesture control
- Sign Language surveillance in Terrorism