**American Sign Language Alphabets Recognition / Classification**

Team: Ajay Karthick Senthil Kumar & Firdose Shaik

We propose to develop a deep learning model to classify images of the American Sign Language Alphabets. American Sign Language (ASL) is a commonly used language by the people who are hard of hearing in the United States. ASL has 26 signs for the alphabets of the English language.

**Problem:**

The hearing-impaired person can communicate to only limited number of people using ASL since very few people understand ASL. Hence developing a Machine Learning Model to recognize ASL alphabets will pave a way to create an effective communication channel. It is interesting because it tries to address a real-world problem and an attempt to resolve it via machine learning algorithms.

**Datasets:**

* <https://www.kaggle.com/datasets/grassknoted/asl-alphabet>
* Training dataset of 87000 images
* 29 classes - 26 alphabets (A-Z), Space, Delete and Nothing.

**Approach:**

We plan to use the Deep Learning algorithm of Convolutional Neural Network (CNN) for the task of classification of the ASL Alphabets. First, we do the image data pre-processing then we build the Deep Convolutional Neural Network, train the model with the training dataset, evaluate the model with the test dataset, compile the model and then use it to recognize the real-time input (ASL alphabet) given by the user.

**Key components of our approach:**

* We will preprocess images data through image resizing and image augmentation.
* Our CNN model will contain deep Convolutional layers, max pooling layer, ReLU activation function, softmax function and dropout layer.
* Dropout layer will be used to prevent overfitting.
* We will use mini stochastic gradient descent