

## American Sign Language (ASL) Recognition

I will be working on a pattern recognition problem using an image dataset, which can be found at <https://www.kaggle.com/datasets/nikhilgawai/sign-language-dataset>. The dataset consists of 10 different sign language classes, such as 'hello', 'thank you', 'sorry', and 'help'.

Since the images in the dataset are of various sizes, I will preprocess them by resizing them to the same dimensions, converting them to grayscale, and normalizing them. I will then create an encoder-decoder model to reduce the image dimensions. PCA cannot be used in this case as it cannot capture non-linear relationships and spatial information.

Next, I will cluster the reduced feature representation of the images using self-organizing maps (SOM). I plan to implement SOM from scratch and observe its 3D presentation.

As the dataset is relatively small, I may also consider using it for pattern recognition.

<https://www.kaggle.com/datasets/nikhilgawai/sign-language-dataset>

I also plan to do other traditional algorithms using the encoded representation of image.