Project Proposal

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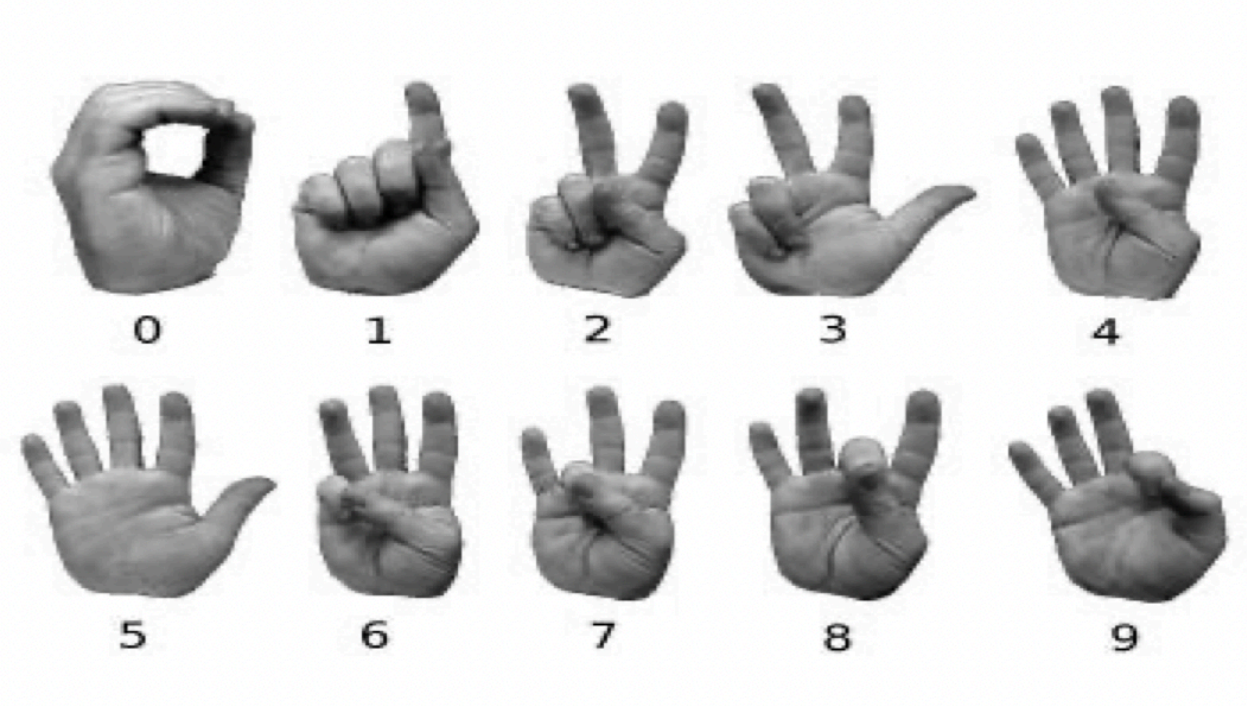
Project Name: Sign Language Recognition

In this project, we are interested in creating a sign detector, detecting numbers from 0 to 9. There are 3 major components of this project:

(1) Create you own data set. We will take photos of our hand, from 0 to 9, 10 photos for each gestures. Then make data augmentation to enrich our dataset by rotation and flipping. Alternatively, we may search for any existing datasets.



(2) Use OpenCV to process all the images we got. We need to extract features from the images in your training set (i.e., perform dimensionality reduction).

1. We need to separate the hand from the environment.

2. The next steps are erosion and dilation to process the images. Dilation help fill some flaws on the hand and erosion helps remove disconnected areas.

3. One does not need entire hand for classification, only the edge of each hand gesture; so, edge detection is helpful. There are many ways to detect edges in images, including Fourier descriptors.

(3) After pre-processing, we can use the resulting images to train our model. Using a Convolutional Neural Network for this task is relatively straightforward.

Finally, test our trained model on test dataset to check model accuracy.

Furthermore, we are also thinking to extend this project to detect sign language using live cam feed.