Computer Vision Final Project - CS6643

Title: Sign Language Detection

From: Disha: dp3074 , Harshul: hj1393 , Omkar: opk208 , Vijay: vg1203

Problem Statement:

In a situation where you have to interact with a person who only understands the sign language, it can be a daunting task to come up with a way to teach him the sign language at that very moment. The goal of this project is to provide an interactive, accessible learning platform for users to learn American Sign Language using computer vision. We were largely inspired by popular language learning apps like Duolingo and using the principles of computer vision and deep learning in it.

Solution:

We will build a flash card application that allows users to use just their webcam and their hand to learn American Sign Language and receive real time feedback. The learning environment is composed of three main parts: Letters, Hand signatures and progress bars. On the right, the user is shown an image of a letter and is asked to present the sign of the alphabet using the hand. If he does it correctly, Green progress bar on the top will be updated, but if it is wrong, the red progress bar below the green one is updated. User needs to make sure he reaches the green progress bar to clear the training level.

Technologies used:

a. OpenCV
b. Deeplearning
c. Python
d. HTML
e. CSS
f. Javascript
g. Django

Computer Vision and Deep Learning principles used (Methods):

a. Optimal Thresholding
b. Object detection and tracking
c. Contour segmentation
d. Convolutional Neural networks
e. Image Classification

Data To Be Used:

We'll be using dataset from Kaggle to train and test our model:
https://www.kaggle.com/datamunge/sign-language-mnist

Expected Results: