American Sign Language detection using machine learning algorithms

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Spring 2020

Similar projects

I have researched on projects related to ASL detection and found two projects which are utmost similar to my capstone project

The name of the first project is American Sign language recognition using leap motion sensor.

In this project the team used a hardware device called leap motion sensor. The sensor is used to detect hand movements and hand gestures. The team used the device’s api to detect gestures and store the data. They than used K nearest neighbor and SVM to detect alphabets

The classification rate of this model is 72.78% for KNN and 79.83% for SVM.

The second project is ASL recognition and conversion to speech is a good project which detects ASL and converts it into speech. They used convolution neural network algorithm to build their model. The team used 4-layer CNN model and used background subtraction technique to recognize gestures. For predicting alphabets, they used Keras predict. For speech they used python speech libraries. The classification rate of this model is around 80%.

So how is my project different from theirs?

Most of the ASL detections models need some kind of hardware for detecting these gestures and the accuracy rate is at best 80%. These detections take lot of time even after training a lot. My project would be hardware independent and I am hoping my model would fetch me an accuracy of 90% or above. I would be using 6 Layer CNN and group it with GAN to train the models.

EDA Analysis

My dataset is from MNIST database (Modified National Institute of Standards and Technology database. Which is commonly used database for image training purpose. Thankfully, I had no missing data or null values. The data is distributed evenly and hence has no bias. I have around

27455 rows with 785 columns with 28x28 pixel values. I further need to use label binarizer to change my target variable from nominal.

Reference

C. Chuan, E. Regina and C. Guardino, "American Sign Language Recognition Using Leap Motion

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