

Capstone Project 2: Analyze and Recognize Hand Gestures

Introduction

The chosen project is meant to recognize hand gestures that are inputted as pictures into a CNN. The gestures are very simple, like thumb up, thumb down, “V” for victory (with two fingers), etc. The purpose of the project is to recognize the labeled gestures from the training dataset, for a new test dataset that was not shown during the training.

Overview of the Data Set

The first step is Data acquisition. The dataset is a free source from the internet, <http://www.nlpr.ia.ac.cn/iva/yfzhang/datasets/egogesture.html>. If this dataset won't be available, there are other similar free datasets that can be used.

There are static and dynamic gestures (like pointing in one direction in a small video) but for this project I shall restrict the analyze to static gestures (still pictures).

Machine Learning

The training set will be processed through a CNN and there are individual boolean outputs for each of the gestures that are analyzed. Only one output at a time can be active.

There are many activation functions that can be tried and the definition of the network itself is flexible (number of layers, number of neurons per layer) so there are many parameters that can be tuned. The metric will be the accuracy, not precision or recall. This will keep thing simple for monitoring the progress.

Deliverables

Jupyter Notebook file with the Python code, raw data, together with a pdf file that summarizes the progress and results: graphs, diagrams.