Real-Time Facial Categorization using Convolutional Neural Networks

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Abstract

For this project, we will make a website which uses the webcam interface of a computer to categorize the face in the stream on the basis of a numerous factors. The faces can be categorized on the basis of gender, age, race, attractiveness and many other factors which are outlined in the table at the end of this abstract. The information related would be shown on the website after the image is processed.

Implementation

We are planning on training multiple convoluted neural networks on a large data set of human faces. The data set has been crowd-labelled with numerous descriptors which we intend to predict on the provided user image. For training, we will apply several architectures and combine the results to form a strong predictor. On the front-end we will have a web interface which applies computer vision algorithms on a live webcam feed from the user, to isolate the face and pass it to our backend, which consists of a series of compiled trained models generated in the training step. Here, we pass the face images as inputs to each of the networks and return the output to the user back through the interface. We intend to make use of convolutional neural networks as the main model behind our classification system.

Hardware/Software Requirements

For training, we require a high performance computer with a modern GPU. We intend to make use of the scikit-learn, tensorflow, keras and opencv Python 3 packages for developing our model. The front end will be through a real-time web interface powered by Django.

Work Distribution

Somnath - Image Pre-processing, ResNet ConvNet Architecture, Ensemble

Mehul - Web front-end, Video Processing, AlexNet ConvNet Architecture

Vikram - Data Pre-processing, VGG-16 ConvNet Architecture.