Real-time Smile Detector

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1 Overview

Detecting social cues is not always an easy task. Every person has their own way of physically expressing emotion and mood, but some expressions are easier to read than others. For example, it is easy to differentiate between a sad person and a happy one; However, some might find it difficult to differentiate between someone who is concerned and one who is sad. Studies have shown that children can tell the difference between a happy person and a sad one by the time they are 7 months old [1]. In this project we aim to train a machine to have the same social cue awareness as that of a 7-month infant. The code will be able to detect whether people on a video feed are smiling or not in real-time. This software has many real-world applications and could be useful to small businesses and people with disabilities. For instance, a coffee shop owner who is not sure what kind of music should be played during operating hours could apply this software to gauge the level of satisfaction of his customers by checking the percentage of people smiling in the store. It could also be used to help people with vision impairment to gauge whether the person they are talking to are happy or not by receiving an audio signal alerting them if the person in front of them smiles. The inspiration for this project was taken from a paper published by Simone Bianco, Luigi Celona and Raimondo Schettini about their approach to detecting smiles using convolutional neural networks (CNN) [2].

2 Process Details

In order to implement this application, we will first need to train our software on what a smile is so that it is able to detect it in a live video stream. To do this we will supply it with a database of images of some people who are smiling and some who are not. We will label these images as either positive (if the person in the image is smiling) or negative (if the person in the image is not smiling). Once the network is trained, we will then receive the video stream to be tested in real-time by constantly reading the computer camera frames and detect the faces in it using Haar cascade face detector. After extracting the face region, we will then pass it to the network to detect if that face is smiling or not.

3 References

[1] Lawrence, K., Campbell, R., amp; Skuse, D. H. (2016, August 25). Can children see emotions in faces? Frontiers for Young Minds. Retrieved March 4, 2022, from https://kids.frontiersin.org/articles/10.3389/frym.2016.00015

[2] Goswami, Anurag Ramakrishna, Ganjigunta Sethi, Rajni. (2021). Review on Smile Detection. International Journal of Scientific Research in Computer Science, Engineering and Information Technology. 577-583. 10.32628/CSEIT2172134.