Adding visual effects on videos in realtime

Introduction

The aim of this project is to produce an application that's able to apply various **filters** and **visual effects** based on its detection algorithm in **realtime**.

Users are able to choose between a variety of different filters which are applied to the video stream.

In the last years, features detection and recognition developed a lot and it has been integrated in our life through various uses. Some of these uses range from daily tasks, like unlocking your phone with a glance, to more advanced features like automatic border control gates using facial recognition.

Materials and methods
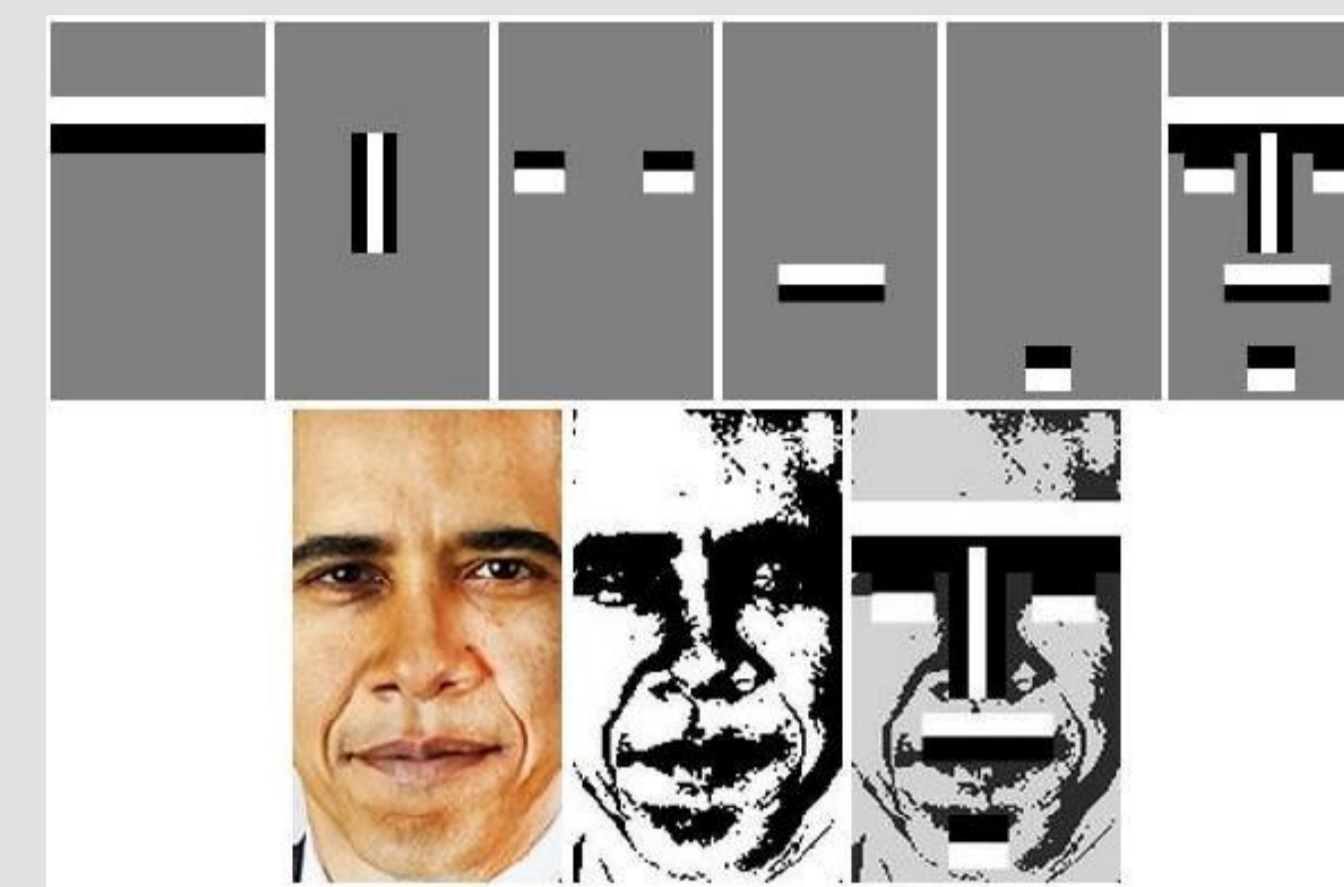
Open-source interpreted programming language.

Open-source library for created in C/C++ that enables us to run computer vision algorithms in real time.

OpenCV

Future work

. Optimization of the filter application
. Background subtraction for use with chroma keying

Haar Cascade Classifiers

A **Haar cascade classifier** is a pretrained object-detection program used to detect specific features in an image or video.

Haar features are calculations on the rectangular regions set at a specific location by summing the pixel intensity of both regions and calculating the difference.

In order to get accurate results, this method has to pass multiple stages. If any stage fails, the classifier will move on to the next region.
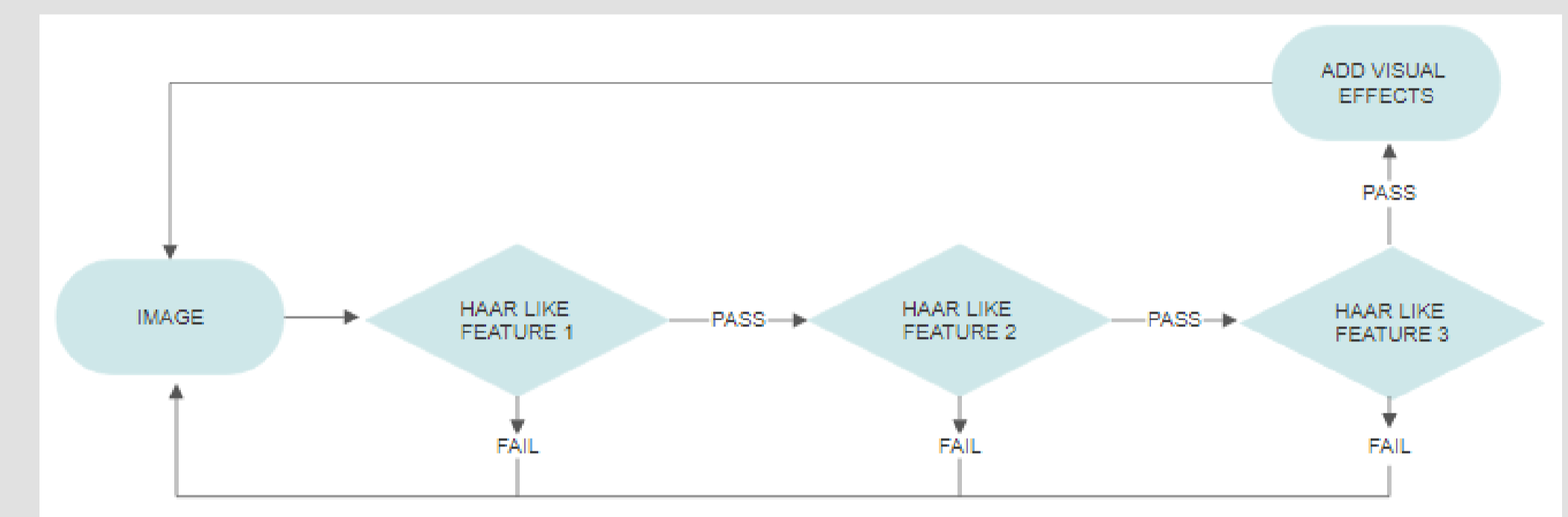
Results

I have successfully applied various filters on human faces using the integrated webcam, as seen in the pictures. This has been done by extracting the **region-of-interest** (ROI) and applying the filter on top of it. In order to apply the filter, I used **thresholding** on the image containing the filter and blacked out everything in the filter's ROI using the **inverse mask**.

Fox filter

Red lens sunglasses

Glasses frame

Aviator sunglasses
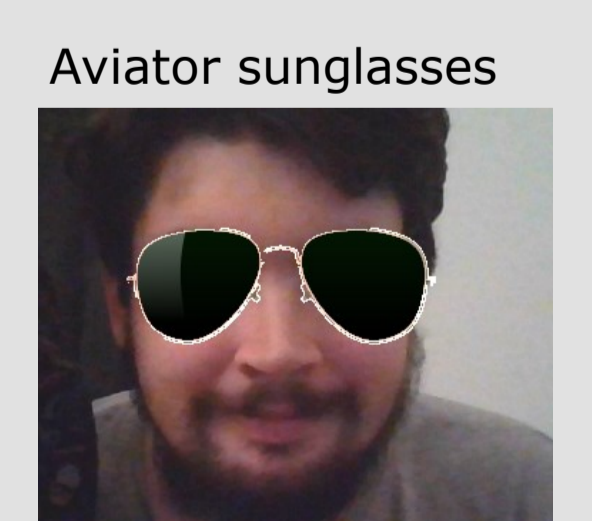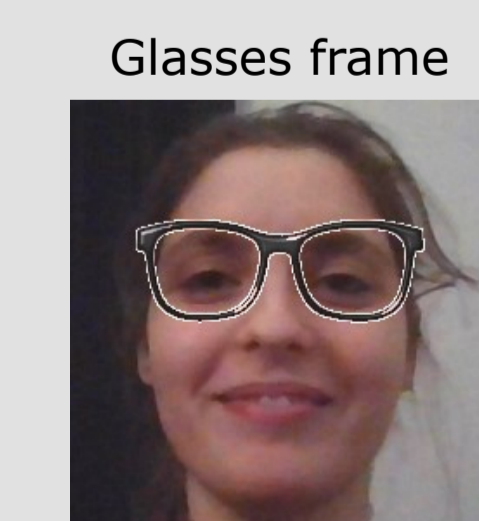
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