Face Detection

Group members:

Mursalov Akif

Tel: +994(050)529-81-89

Mail: akif.mursalov@ufaz.az

Alizade Alasgar

Tel: +994(055)248-84-47

Mail: alasgar.alizada@ufaz.az

Supervisor:

Javid Khalilov

Abstract

In this study project we created a very useful and indispensable project. The main aim in creating this project was to show how works some application and function in modern devices. By creating this project we easily can show how exactly work webcam in smartphones, how works new function in some smartphones – 'Face ID' and etc. The name of this apparatus is 'Face Detection'. It is able to recognize person's face and show it in the screen by surrounding it with rectangle (or with some other methods). In order to create code that will give us an opportunity to detect someone's face we used 'Python' program language. Also we used very important file named 'haarcade_frontalface_defult.xml' that helped us to identify face and it's coordinates in imagine. As a result we got an apparatus that can identify face in any photo, video and even can identify face by using computer's webcam in real time.

Project Outline

Performed tasks:

1)Explore how ‘Face Detection’ works

2)Write a program for ‘Face Detection’

3)Test if ‘Face Detection’ program works

Responsible group member:

Mursalov Akif

Time taken for task:

2 weeks

Introduction

Face detection is a computer technology being used in a variety of applications that identifies human faces in digital images.
Face detection has a very wide usage in our daily life. It is used in phones webcams in order to focus on person’s face, also it is used as a ‘Face ID’ in smartphones. That is why Face Detection has a very big importance. Face Detection refers to the psychological process by which humans locate and attend to faces in a visual scene.

Methods

Employed techniques

The main method that helped us to write a Face detection program is ‘haarcade_frontalface_defult.xml’ file. This file help computer to identify where is person’s face and where is other objects. Without this file the program will not work. It has a special method which allows program spend less than 1 second in order to identify face.

Programming language

In order to write this program we used ‘Python” language, because it is much easier to write program in this language than in JavaScript, for example. Different libraries that easily can be imported and used in ‘Python’ helped us to decrease amount of code lines. The only library that we used is ‘cv2’. This library allows us to get path to our image, and to create a window where selected image will be shown.

Undertaken procedures

First of we imported ‘cv2’ library and added ‘haarcade_frontalface_default.xml’ file to our program in order to our program could use this file and identify person’s face in image. Then imported our photo in which we want to identify person’s face. The main thing is that computer cannot identify persons face in colorful image that is why after importing our colorful photo we should convert it in to black-white photo. After that our program easily can find any face in photo.
With help of ‘haarcade_frontalface_default.xml’ file in which has been written an algorithm that helps computer to find face we get the coordinates of face in our black-white photo. After receiving this coordinates we easily can draw rectangles around people’s faces. And of course in order to get see the result of our work we create a window, we give a name to this window and put our photo with rectangles around people’s faces to this window.

Result

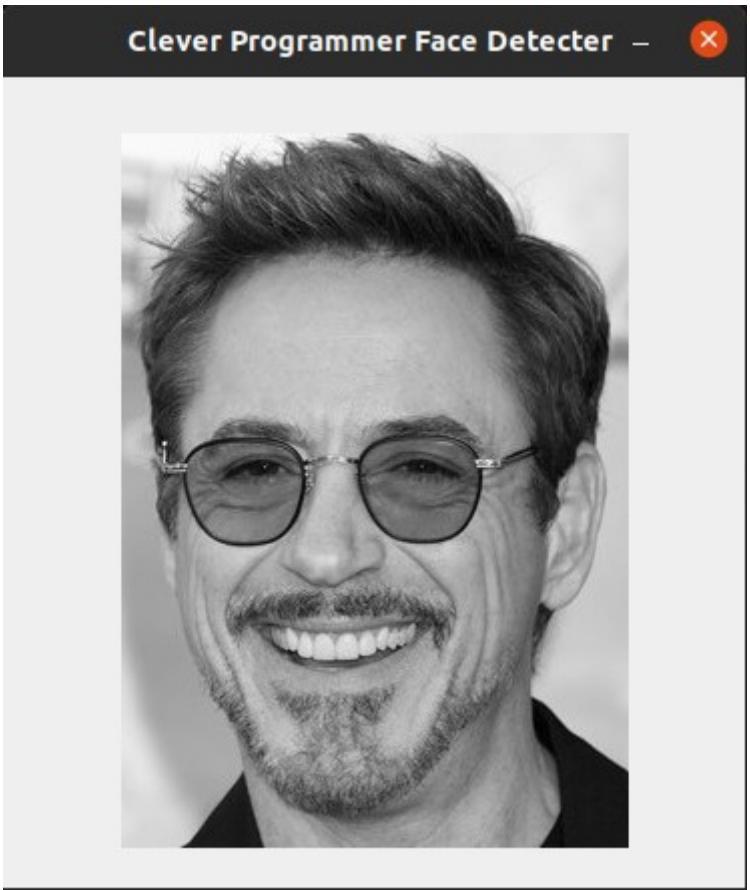
As a result we get workable Face Detection for images, videos and even for real time Face Detection. We created an apparatus that can distinguish people’s faces and any other object that can be shown in a photo. This program easily can be used in security webcams in order to identify any face. Face Detection gives a very big opportunity. Also this program can be used in order to identify other object, after some changes in current code. Face Detection is a main way to protect you gadgets because this program can identify even if 2 people very much similar to each other. So passwords that require ‘Face ID’ is the most safety.

Discussion and Conclusion

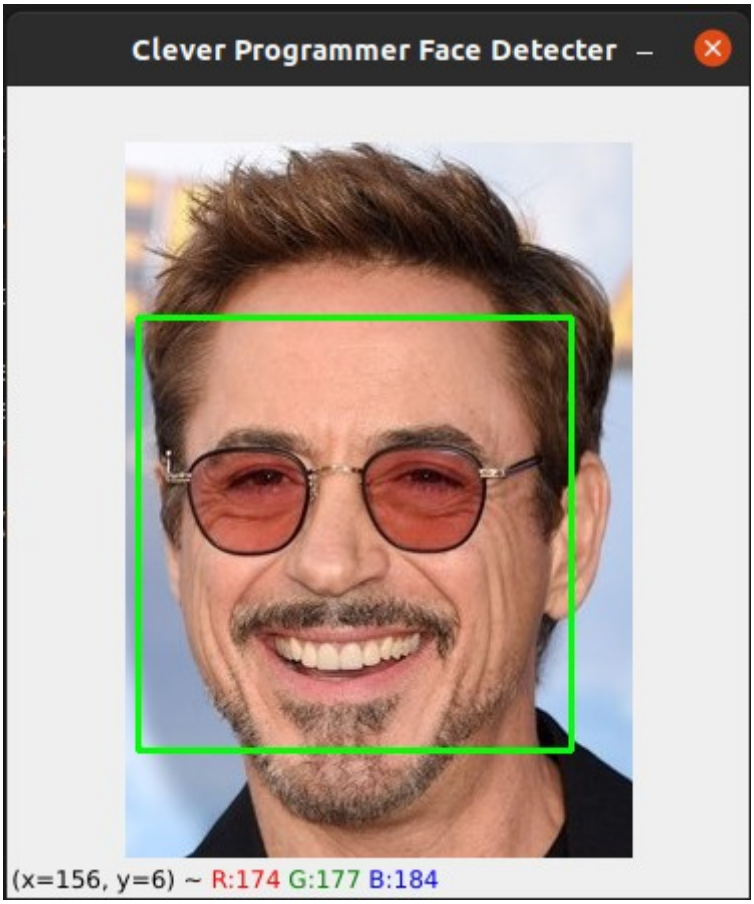
For Face Detection we wrote a code that check all pixels in order to define if there is any face in photo. Also to be more accurate our program convert all photos to white-black photo. In this way it can identify face easily.

The current photo:

White-Black photo:



That is an example how Face Detection works:



References

[1] https://www.youtube.com/watch?v=R7B8sSByZGQ&t=615s
[2]https://github.com/opencv/opencv/tree/master/data/haarcascades