Real-time eye tracking using OpenCV and Dlib

OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products. Being an Apache 2 licensed product, OpenCV makes it easy for businesses to utilize and modify the code.

Dlib is a modern C++ toolkit containing machine learning algorithms and tools for creating complex software in C++ to solve real world problems. It is used in both industry and academia in a wide range of domains including robotics, embedded devices, mobile phones, and large high performance computing environments. Dlib's open source licensing allows you to use it in any application, free of charge.

Online exam portal is a web application platform conducting online examinations.It performs all crud operations-Create,Retrieve,Update,Delete.In this project,the first task is to gain the relevant facial structures and their locations from the image received by the camera. One structure needed is the location of the eye within the image. The gaze direction cannot be gained directly. But it can be derived indirectly from the location of the pupil. As the pupil is the part of the eye, which absorbs the light, it is directed to the location the person is looking at. Therefore, you can determine the gaze direction indirectly by determining the location of the center of the pupil relatively to the location of the eye. In conclusion, the information that has to be derived from the image are the locations of the eyes and pupils.

Dlib is a cross-platform software library written in C++ that offers the needed algorithms and is used to detect and locate the eyes, which is done in three steps, which are the following:

1. Detect and locate the face in the image

2. Detect and locate facial key points

3. Derive the eye locations from the facial key points

These algorithms are based on machine learning, where large datasets, are used to train neural networks in solving the addressed problems.