

FACIAL RECOGNITION

A facial recognition device is a device that takes an image or a video of a human face and compares it to the other images in a database. When using facial recognition, several pictures of the subject must have been taken at different angles and usually with different facial expressions then stored in a database.

Facial recognition system is a complex image-processing problem in real world applications with complex effects of illumination, occlusion and recognition techniques in image analyses. Detection application is used to find position of the faces in a given image. Recognition algorithm is used to classify given images with known structured properties, which are used commonly in most of the computer vision applications. Recognition applications use standard images, and detection algorithms detect the faces and extract face images which include eyes, eyebrows, nose, and mouth. That makes the algorithm more complicated than single detection or recognition algorithm.

The first step for face recognition algorithm is to acquire an image from a camera. Second step is face detection from the acquired image. As a third step, there will be a face recognition that takes the face images from output of detection part. Final step is person identity as a result of recognition part. Acquiring images to computer from camera and computational medium via frame grabber is the first step in face recognition systems. The input image, in form of digital data, is sent to face detection algorithm part of a software for extracting each face in the image. After faces are detected, the faces should be recognized to identify the persons in the face images.

When designing a facial recognition system, there are two major parts which are the input part and face detection part. The input part is prerequisite for face recognition system. Image acquisition operation is performed in this part. Live captured images are converted to digital data for performing image-processing computations and these captured images are sent to face detection algorithm. The face detection part performs locating and extracting face image operations for face recognition system.

In the security system, the facial recognition section is the first section to perform its functions as it is always running because the section of the system will always be on. The cameras could be positioned at specific areas and at time of verification and identification, the subject stands in front of the camera for a few seconds and then the face is scanned after which the image is compared to those that have been previously recorded.

Thus, if the subject's face has been registered on the system like that of the owner, it will compare the image to the ones in the database and find a match. When this system finds a match and recognizes the face, nothing really happens. However, if the subject's face has not been registered on the security system and it runs a scan on the face, it doesn't match any of the image faces in the database. This causes the system to either sound an alarm or send a notification to the owner of the security system with the application deployed on his mobile phone. The owner sees a video of the unknown face that his security system has captured where he makes a decision to either turn off the alarm or call the subject (if known) to tell them how the system works and how to disable or unlock it.

