



COVID 19 Concerns: A Boost to Contactless Biometric System

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Abstract

Finger print recognition is a secure and convenient technology that has become commonly used, not only in Smart phone but in our everyday activities. However, the recent global outbreak of corona virus is raising alarm about how safe using finger print authentication really is as touching the sensor can possibly spread the virus. The objective of this study is to provide ways to eliminate the risk of affecting with corona virus. This can be achieving by providing a touchless/contactless identification system at access control points using 3D + system develop by TBS. The system provides frictionless, no-contact readings even for people going through the system in a queue. The system captures properties of the hand and has applications for the COVID environment. This system provide high accuracy and security ratings are suitable for critical infrastructure applications, and there is no contact; the system is fully hygienic.

Keywords: Biometric, TBS, Contactless, Authentication, Sensor, Frictionless

1.0 Introduction

Biometric authentication can be defined as the physical or behavioral characteristics that can be used to digitally identify a person to grant him/her access to the systems, devices or data. Typical examples of these biometric identifies include the following: fingerprints, facial patterns, voice or typing cadence (Korolov, 2019).

According to Bhasin et al., (2014) Fingerprint recognition system is a biometric system that uses fingerprint as biometric input to the system. A fingerprint consists of patterns of ridges and valleys on the surface of a fingertip. Each individual has

fingerprint which is different from the other. Fingerprint recognition is a biometric method of verifying a match between two human fingerprints. Fingerprints are one of the many forms of biometrics used to identify individuals and verify their identity.

Commonly, fingerprint technologies deal with touch based acquisitions. That means they require users to press their fingers against an acquisition surface. However, solutions that do not demand contact (touchless) are increasingly being proposed in order to overcome the problems related to touch based technologies (Salum, 2017)

In today's modern world, the spread of disease through the workplace has probably not been an important in choosing touch based biometric system (TBS, 2020).

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the current COVID-19 pandemic sweeps the world and drastically alters society and governments to use novel biometric technologies to limit contagion and maintain economic (Natta et al., 2020)

COVID- 19 which is a respiratory illness caused by the new coronavirus that has affected 21, 0000+, killing 100,000+ individuals at this time. Most offices are now hotbeds due to the spread of the viruses which infecting most workers within a short time. Therefore, there is need to know how offices get infected by the spread of viruses to contain the spread in offices so that we can achieve a more hygienic and productive place of work. Coronavirus can stay on an infected surface for a period of few hours or some days (Epidemiologist University of North Carolina,). There is thus need for a touchless biometric system that will address the problems of touch based Biometric system.

Touchless fingerprinting addresses the problem of quality at its fundamental level, which is the way fingerprint images are captured. Since it does not require the user to press his/her fingers on a surface, such systems do not need, for example, algorithms that compensate artifacts resulting from skin elasticity or non-ideal contact (Salum et al., 2020). According to Bhasin (2014), stated that touchless biometric system has the following benefit which include:

- a. **No Latent Fingerprints:** The touchless recognition system leaves a fingerprint. So it is not possible for the sensor to make errors due to latent fingerprints.
- b. **Identification accuracy:** The ridges on the fingers are produced in high quality, independent of the finger's appearance, condition, pressure applied or ambient conditions. There are no problems like false minutiae or bad contact.
- c. **Large Clear Image:** The capturing area for image is not limited to a small contact surface but, to a certain extent, wraps around the finger. The touchless technology allows for clear, correct pictures not influenced by movements on a contact surface.
- d. **Robust and Reliable:** Dirt or dust on the protective glass has no influence on quality of image and function of the sensor.
- e. **Easy maintenance and Durability:** The complete sensor is protected behind a glass screen and never is touched when in use. Therefore, it cannot be worn, damaged or affected by environmental factors, nor can the sensor be influenced by any substances or chemicals attached to the finger.
- f. **User comfort:** The assembly is extremely easy to use. Touchless fingerprint identification allows the highest standard of hygiene

2.0 Objective

- a. To identify the problem caused by the touch-based fingerprint system.
- b. To develop a reliable touch-less fingerprint recognition system in order to overcome the limitations of touch based fingerprint technology for better security purposes

3.0 Methodology

The approach to this research paper is divided into three stages as follows:

a. Sensor detection

Identify presences of an object i.e. hand or face



Figure 1: Object Detector (Source:Bhasin 2014)

This include: pre- processing and feature extraction

b. Processing

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c. Marching

These compare if the finger captured by the digital camera is the same with what is stored in the database. If yes then access granted if no then access denied.

The figure 2, below shows the block diagram of the system

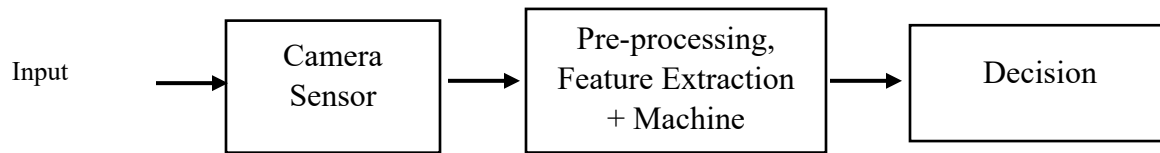


Figure 2: Block diagram of COVID 19 Touchless System

Figure 3, below shows the biometric system. Which shows how the overall Biometric Touchless System work

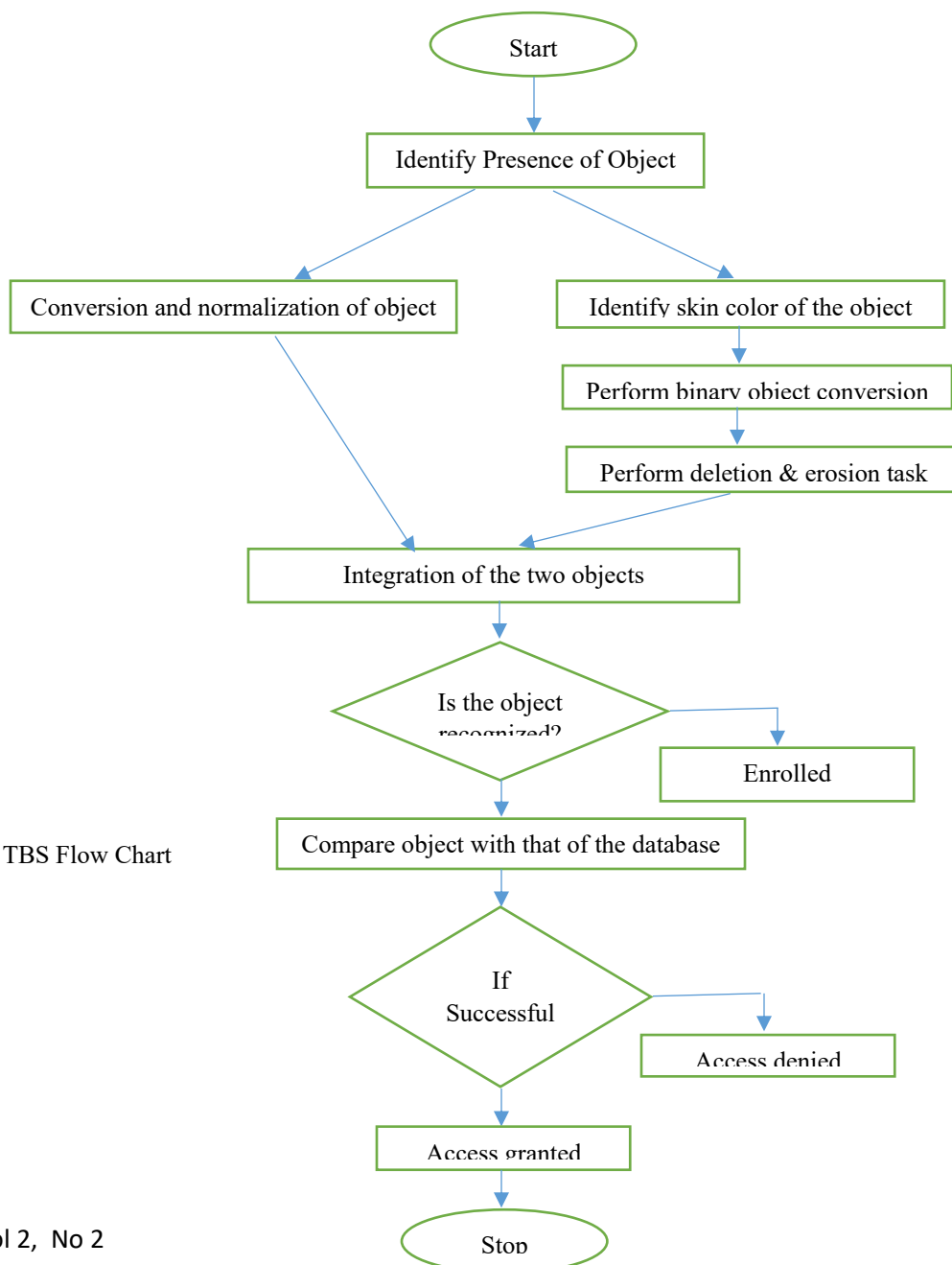


Figure 3: TBS Flow Chart

Conclusion

This paper discussed the challenges of the touch based biometric based system such as panic, retention and unhygienic due to COVID pandemic. The paper then come up with a touchless biometric model to overcome the challenges of the existing touch based system whereby users do not have to put their finger on a fingerprint sensor. The touchless biometric system model has three stages namely: sensor detection, processes and decision. The users simply present their finger to a hole in the front of the device and carefully positioned cameras take three simultaneous images of the entire finger. The images are stitched together, and biometric template is produced.

Recommendation

- a. The recommendation of this paper are as follow:
- b. The researcher shall work the organization in order to developed full implementation of the touchless system
- c. The government shall use this work to educate the organization about the benefit of using touchless system in order to avoid spread of COVID- 19 between the staff.

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