Biometric identification

BIOMETRIC IDENTIFICATION

Introduction

The escalating threat of global terrorism and narcoterrorism in the twenty-first century has generated massive changes in the identification of suspected criminals. One of the technological highlights in this regard has been biometric identification. Biometrics refers to the science of identifying human being by analyzing biological traits or physical characteristics (Bolle, 2004). This paper describes the most widely-used forms of biometric identification and presents the advantages and disadvantages of each.

Advantages and Disadvantages of Biometric Systems

Biometric identification is an automated method used to recognize a person based on behavioral or physiological characteristics (Tipton & Krause, 2004). Behavioral characteristics include voice or handwriting. Physiological characteristics include fingerprint, iris, or hand geometry.

1. Fingerprint analysis

The most commonly known biometric system is a the fingerprint analysis (Bolle, 2004). The principle here is that each individual’s set of fingerprints is unique. This method requires a user to place his or her finger onto a reader. The person’s fingerprint is scanned and sent to a database where it will be compared, identified, and verified. Fingerprint technology is widely used today in law enforcement, banking, and in merchandising. The biggest strength of this method is its high accuracy and low incidence of false acceptance and its low cost. However, fingerprint technology is said to have a high false rejection rate (where valid users are incorrectly rejected access).

Sometimes, the technology does not recognize accurately in case of hand trauma, age, or disease.

2. Hand geometry

The hand geometry identification method is the second most commonly used biometric tool (Jain, Ross, & Pradhakar, 2004). Basically, it analyzes finger length and the edge of a hand. Hand biometric requires a person to place his or her hand on the device which has pegs to lay the hand on. When the hand is put properly in place, the device scans and checks the database for identification or verification. While the hand biometric device is easy to integrate, use, and can even work despite dirty hands, the technology is expensive, has low accuracy level, cannot read when hand is injured or has suffered from trauma, or when a person has arthritis.

3. Retina technology

The concept is that it is practically impossible to counterfeit a human retina. The scanner analyzes capillary vessels situate in the back of the eye. Retina biometrics requires the person to place his or her eye close to a scanner and as the device scans, to focus on a specific point while being still (Jain, Ross, & Pradhakar, 2004). The process takes 10-15 minutes. Retina technology has a very high accuracy rate. However, it is a sensitive process, expensive, and quite uncomfortable for those who wear glasses.

4. Voice technology

Voice biometrics analyzes the pitch or tone of a person’s voice. Voice biometrics fall into two categories: voice recognition and speech recognition. Voice recognition analyzes quality of the voice while speech recognition interprets what a person says (Jain, Ross, & Pradhakar, 2004). The

advantages of this system is that is it non-invasive and not susceptible to error due to a cold. However, its accuracy may be compromised with the presence of acoustics in the room and increased age.

Conclusion

Biometric identification includes methods such as fingerprint technology, hand geometry, retina analysis, and voice recognition. Although biometric identification is undeniably cutting edge technology, there are disadvantages present that is inherent with any modern technological systems.

References

Bolle, R. (2004). Guide to biometrics. New York: Springer.

Jain, A. K., Ross, A., & Prabhakar, S. (eds.) (2004). An introduction to biometric recognition. In IEEE Transactions on Circuits and Systems for Video Technology (14th ed.). New York: Springer.

Tipton, H. K. & Krause, M. (eds.) (2004). Information security management handbook. New York: CRC Press.