Biometrics Systems

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Applications of biometric systems

- Biometric systems can be used in a large number of applications. For security reasons, biometrics can help make transactions, and everyday life is both safer and more practical. The following domains use biometric solutions to meet their respective needs:
- Legal applications:
- Government applications:
- Commercial applications:

Legal applications:

- Justice and law enforcement: Biometric technology and law enforcement have a very long history, and many very important innovations in identity management have emerged from this beneficial relationship. Today, the biometrics applied by the police force is truly multimodal. Fingerprint, face, and voice recognitions play a unique role in improving public safety and keeping track of the people we are looking for.

Government applications

- Border control and airport: A key area of application for biometric technology is at the border. Biometric technology helps to automate the process of border crossing. Reliable and automated passenger screening initiatives and automated SAS help to facilitate international passenger travel experience while improving the efficiency of government agencies and keeping borders safer than ever before.
- Healthcare: In the field of healthcare, biometrics introduces an enhanced model. Medical records are among the most valuable personal documents; doctors need to be able to access them quickly, and they need to be accurate. A lack of security and good accounting can make the difference between timely and accurate diagnosis and health fraud.

Commercial applications:

- Security: As connectivity continues to spread around the world, it is clear that old security methods are simply not strong enough to protect what is most important. Fortunately, biometric technology is more accessible than ever, ready to provide added security and convenience for everything that needs to be protected, from a car door to the phone's PIN.
- Finance: Among the most popular applications of biometric technology, financial identification, verification, and authentication in commerce help make banking, purchasing, and account management safer and more convenient and responsible. In the financial area, biometric solutions help to ensure that a customer is the person he/she claims to be when accessing sensitive financial data by entering his/her unique biometric characteristics and comparing them to a model stored in a device or on a secure server. Banking solutions and the payment technologies available today use a wide range of biometric modalities: fingerprints, iris, voice, face, fingerprint, palm veins, behavior, and other types of biometric recognition are all used alone or combined in a multifactorial manner as a system, to lock accounts and serve against fraud.
- Mobile: Mobile biometric solutions live at the intersection connectivity and identity. They integrate one or more biometric terms for authentication or identification purposes and take advantage of smartphones, tablets, other types of handhelds, wearable technology, and the Internet of things for versatile deployment capabilities. Thanks to the versatility brought by modern mobile technology, as well as the proliferation of mobile paradigms in the consumer, public, and private world, mobile biometrics is becoming more and more important.

Eye movements tracking applications:

- Automotive industry: there is an established relationship between eye movement and attention. Thus, tracking the car driver's eye movements can be very helpful in measuring the degree of sleepiness, tiredness, or drowsiness. The sleepiness of the driver can be detected by analyzing either blink duration and amplitude or the level of gaze activity .
- Screen navigation: one of the most important applications for people with disabilities is screen navigation. Using cameras, the application can track a person's eye movements in order to scroll a web page, write text, or perform actions by clicking on buttons on a computer or mobile devices. Therefore, this kind of application is gaining more attention recently due the rapid development and the growing need of new means of screen navigation especially on mobile devices platforms.

Eye movements tracking applications (cd.)

- Aviation: the flight simulators track the pilot eye and head movement in order to analyze the pilot's behavior under realistic circumstances. This simulator is capable of evaluating a pilot's performance based on his eye movements combined with other information. It can be also used as an important training tool for new pilots in order to help them to look at the primary flight display (PFD) more regularly in order to monitor different airplane indicators.

HEALTHCARE

- Various aspects of the healthcare system could benefit from biometrics.
- For example, biometric data could enable faster patient identification in emergency situations. It could also help prevent patient fraud and mistaken prescriptions, which are common issues in the healthcare industry. New York's Northwell Health of New York uses iris scans to address this.
- Biometrics could also protect patient privacy, making their health information available only to those with permission. Authorized doctors could verify their identity with a quick iris or fingerprint scan.
- Using facial recognition or fingerprints as part of multi-factor authentication could also advance telemedicine through accurate patient identification and secure digital access of patient information for the attending doctor.

HOSPITALITY

- Facial recognition is growing within the hospitality industry as a new way of providing better personalized services for customers. From instant check-in to identification-based personalized preferred services, the hotel industry has started to embrace biometrics.
- Marriott International has been testing its facial recognition check-in kiosk in two hotels in China, with the entire process taking less than a minute.
- The restaurant industry is also starting to use biometrics to remember customers' order preferences. For example, Dallas-based BurgerFi and Malibu Poke use facial recognition to speed up the ordering process by bringing up customers' favorite options.

EDUCATION

- Facial recognition or fingerprints can be applied to anything requiring authentication, from lunch programs to dorm access. School faculty could use a similar system to access student grades and personal information.
- Security within school has recently became a growing problem in the United States. Facial recognition can quickly identify any unauthorized presence within school grounds.
- With artificial intelligence better able to read body language and facial features, academic integrity can better be preserved. This is particularly useful in a college exam or standardized testing situation, where proctors may not necessarily notice signs of cheating in large groups of test-takers.

DNA match

- How does DNA match work?
- DNA is inherited by getting half of your genetic information from your mother and the other half from your father. But your genetic information does not tell us what portions you inherited from each. The first step for DNA matching is phasing. This process uses raw DNA data to distinguish between the two pieces of a person's genome inherited from each parent.

Thank you for your Attention