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New Access Control Technologies: Biometric Identification

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NEW ACCESS CONTROL TECHNOLOGIES: BIOMETRIC IDENTIFICATION

THE NEED

The access control system plays major role in building security. These days, only couple of engineers and managers are needed to wholly contol 20 story building's physical security objects such as elevators, door locks, lights, security system turning on and off, etc. through computerized automatic systems. Regarding contolling people accessing building property, it is almost impossible for a few security people to recognize and check all visitors and residents for security reason. Even though the visitors, office workers, and residents are given keys or id-tags after being checked out for identification, there is still possibility that unauthorized people could access important property with fake id's or keys, etc. So, many researches regarding identification recognition have been requested and done.

Recently the interest in biometric technology has arisen as a new, effective and secure method in identifcation recognition, which is one of the most important parts in building security systems.

THE TECHNOLOGY

Biometrics are computerized methods of recognizing people based on physical or behavioral characteristics. The main biometric technologies include face recognition, fingerprint, hand geometry, iris, palm prints, signature and voice. Biometric technologies can work in two modes – authentication (one-to-one matching) and identification (one-to-many) matching. However, only three biometrics are capable of the latter – face, finger and iris.

FACIAL IDENTIFICATION:

Identification (one-to-many searching): To determine someone's identity in identification mode, a solution like FaceIt® from Visionics Corp. quickly computes the degree of overlap between the live faceprint and those associated with known individuals stored in a database of facial images. It can return a list of possible individuals ordered in diminishing score (yielding resembling images), or it can simply return the identity of the subject (the top match) and an associated confidence level.

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Verification (one-to-one matching):

In verification mode, the faceprint can be stored on a smart card or in a computerized record. The system simply matches the live print to the stored one--if the confidence score exceeds a certain threshold, then the match is successful and identity is verified.

What makes the faceprint powerful is the fact that it is resistant to changes in lighting, skin tone, facial hair, hair style, eyeglasses, expression and pose and hence depends on the intrinsic shape and features of the face. In addition, it has been found that the faceprint contains enough information to accurately distinguish an individual amongst millions of people.

Fingerprint Indentification:

Fingerprint Identification devices are very secure and can be applied to many cases from almost all computing device to your office door locking system.

Fingerprint Identification has been around for decades. It is not only fairly fool-proof, but fingerprint identification devices can be installed so that a fingerprint is required before your computer will be even be permitted to boot up for optimal security advantages.

Fingerprint Identification methods that employ "minutiae based processing identification algorithms" are the most secure to use. They offer additional security the original fingerprints themselves are not stored anywhere on a network or computer system where an intruder could access them. What is stored and recorded for reference are a sufficient number of specific points of importance about a fingerprint, called "minutiae" that are unique to an individual fingerprint and permit it to be recognized and allow the user admittance onto a system. Fingerprint reading devices that rely solely upon capacitive sensors to capture and accurately detect the ridges and valleys of a fingerprint are fine in an office environment. However, such sensors may have difficulty properly identifying a dirty fingerprint or an elderly person's fingerprint that changes due to the laxity of the skin.

Iris Recongnition:

Iris recognition is the most accurate, stable, scalable and non-invasive authentication technology in existence. It offers state-of-the-art authentication, destined to replace tokens, PINs and passwords and to gain wide acceptance over less accurate biometrics like fingerprints, voice and facial recognition, hand geometry, and keystroke analysis. The process is scientifically proven, user safe and operationally reliable. The iris recognition process begins with video-based image acquisition that locates the eye and iris — the colored portion that surrounds the pupil. The boundaries of the pupil and limbus are defined, eyelid occlusion and specular reflection are discounted, and quality of image is determined for processing. Typically, identification time averages about two seconds. A key differentiator for iris recognition is its ability to perform identification using a one-to-many search of a database.

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The Benefits

- Low possibility of fake identification
- Easy and economic maintenance of database due to low possibility of ID information modification
- Effective method to contol large size of ID database automatically

Status

- In the Unted States, some police and public safety departments started using facial recognition systems in criminal justice solutions.
- Many banks are using fingerprint recognition systems to authenticate personal identification.

Barriers

- Relatively high price to apply these technologies against traditional method such askey systems, card systems, security personnel check-out, etc.
- Yet limited number of applications developed

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Reviewers

Peer reviewed as an emerging construction technology

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