

BIOMETRIC TECHNOLOGIES

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Biometric technologies are based on biometry and on measurements of unique characteristics of a person. A person can inherit some characteristics, e.g.: DNA, fingerprints, an eye iris; some characteristics can appear during lifetime like handwriting, voice or gait.

All biometric systems function according to a similar scheme. First of all, a system remembers a sample of biometric characteristic (it is called a recording process). During recording some biometric systems can ask for more samples for creating the most exact image of the biometric characteristic. Then the received information is processed and transformed into a mathematical code. The system can also ask for some actions for attributing a biometric sample to a certain person, e.g., to enter personal identification number (PIN) or to insert the smart card containing a sample into the slot. In that case, the sample of the biometric characteristic is made once again and is compared to the presented sample. An identification process has four stages:

1. Recording – a physical or behavioural sample is remembered by the system;
2. Allocation – a unique information is taken out from a sample and the biometric sample is made;
3. Comparison – the stored sample is compared to the presented;
4. Coincidence/discrepancy – the system solves whether biometric samples coincide, and makes the decision.

The digital code with length in 1000 bits associated with a certain person having the right of access is stored in a special database. The scanner or any other device used in the system, reads a certain biological parameter of the person. After that the received image or a sound is processed and transformed into a digital code. This very key is compared to the contents of a special database for personality identification.

All methods of identification can be divided into two groups – static and dynamic methods.

Static methods include identification on the fingerprint, on the shape of a palm, on the arrangement of veins on the palm face, on the eye retina, on the eye iris, on the shape of a face, on persons thermogram, on DNA and such unique ways, as identification on the under nail layer of skin, on the volume of the fingers specified for scanning, on the shape of an ear, on the body smell etc.

Dynamic methods of biometric authentication are based on the behavioural (dynamic) characteristic of a person. Among dynamic methods there are identification on handwriting, on keyboard handwriting, on the voice, on movement of lips during the reproduction of a code word, on dynamics key turning in the door lock etc.

Biometric technologies are applied in many areas connected with the safety of access to information and material objects, and also for solving problems of unique identification of the person. The main spheres of biometric technologies are:

- Access control;
- Information protection;
- Identifications of clients.

The list of the used sources:

1. Biometric for network security / Paul Raid, 2004
2. Biometric technologies and verification systems / John Vacca, 2007
3. Security and access control using biometric technologies / Robert Newman, 2009