Biometrics Glossary

Introduction

This set of terms was developed by the National Science & Technology Council's (NSTC) Subcommittee on Biometrics with the full understanding that national (INCITS/M1) and international (ISO/IEC JTC1 SC37) standards bodies are working to develop standard references. The subcommittee will review this Glossary for consistency as standards are passed. The subcommittee recognizes the impact of ongoing challenge problems, technical evaluations, and technology advancements. The Glossary will be updated accordingly to reflect these changes. The statements herein are intended to further the understanding of a general audience and are not intended to replace or compete with sources that may be more technically descriptive/prescriptive.

Glossary Terms

Accuracy

A catch-all phrase for describing how well a biometric system performs. The actual statistic for performance will vary by task (verification, open-set identification (watchlist), and closed-set identification). See www.biometricscatalog.org/biometrics/biometrics_101.pdf for further explanation. *See also d prime, detection error trade-off (DET), detect and identification rate, equal error rate, false acceptance rate (FAR), false alarm rate (FAR), false match rate, false non-match rate, false reject rate, identification rate, performance, verification rate.*

Algorithm

A limited sequence of instructions or steps that tells a computer system how to solve a particular problem. A biometric system will have multiple algorithms, for example: image processing, template generation, comparisons, etc.
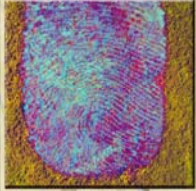
ANSI - American National Standards Institute

A private, non-profit organization that administers and coordinates the U.S. voluntary standardization and conformity assessment system. The mission of ANSI is to enhance both the global competitiveness of U.S. business and the U.S. quality of life by promoting and facilitating voluntary consensus standards and conformity assessment systems, and safeguarding their integrity. For more information visit www.ansi.org. *See also INCITS, ISO, NIST.*

Application Programming Interface (API)

Formatting instructions or tools used by an application developer to link and build hardware or software applications.

Arch

A fingerprint pattern in which the friction ridges enter from one side, make a rise in the center, and exit on the opposite side. The pattern will contain no true delta point. *See also delta point, loop, whorl.*
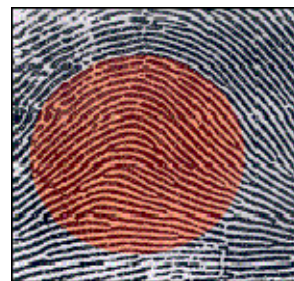
Attempt

The submission of a single set of biometric sample to a biometric system for identification or verification. Some biometric systems permit more than one attempt to identify or verify an individual. *See also biometric sample, identification, verification.*

Authentication

1. The process of establishing confidence in the truth of some claim. The claim could be any declarative statement for example: "This individual's name is 'Joseph K.' " or "This child is more than 5 feet tall."

2. In biometrics, "authentication" is sometimes used as a generic synonym for verification. *See also verification.*

Automated Biometric Identification System (ABIS)

1. Department of Defense (DOD) system implemented to improve the U.S. government's ability to track and identify national security threats. The system includes mandatory collection of ten rolled fingerprints, a minimum of five mug shots from varying angles, and an oral swab to collect DNA.

2. Generic term sometimes used in the biometrics community to discuss a biometric system. *See also AFIS.*

Automated Fingerprint Identification System (AFIS)

A highly specialized biometric system that compares a submitted fingerprint record (usually of multiple fingers) to a database of records, to determine the identity of an individual. AFIS is predominantly used for law enforcement, but is also being used for civil applications (e.g. background checks for soccer coaches, etc). *See also IAFIS.*

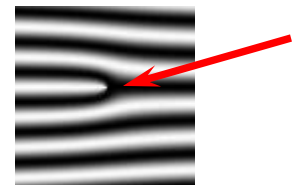## Behavioral Biometric Characteristic

A biometric characteristic that is learned and acquired over time rather than one based primarily on biology. All biometric characteristics depend somewhat upon both behavioral and biological characteristic. Examples of biometric modalities for which behavioral characteristics may dominate include signature recognition and keystroke dynamics. *See also biological biometric characteristic.*

Benchmarking

The process of comparing measured performance against a standard, openly available, reference.

Bifurcation

The point in a fingerprint where a friction ridge divides or splits to form two ridges, as illustrated below. *See also friction ridge, minutia(e) point, ridge ending.*

Binning

Process of parsing (examining) or classifying data in order to accelerate and/or improve biometric matching.

BioAPI – Biometrics Application Programming Interface

Defines the application programming interface and service provider interface for a standard biometric technology interface. The BioAPI enables biometric devices to be easily installed, integrated or swapped within the overall system architecture.

Biological Biometric Characteristic

A biometric characteristic based primarily on an anatomical or physiological characteristic, rather than a learned behavior. All biometric characteristics depend somewhat upon both behavioral and biological characteristic. Examples of biometric modalities for which biological characteristics may dominate include fingerprint and hand geometry. *See also behavioral biometric characteristic.*

Biometrics

A general term used alternatively to describe a characteristic or a process.

As a characteristic:

> A measurable biological (anatomical and physiological) and behavioral characteristic that can be used for automated recognition.

As a process:

> Automated methods of recognizing an individual based on measurable biological (anatomical and physiological) and behavioral characteristics.

Biometric Consortium (BC)

An open forum to share information throughout government, industry, and academia. For more information visit www.biometrics.org.

National Science and Technology Council (NSTC)

Committee on Technology

Committee on Homeland and National Security

Subcommittee on Biometrics

Biometric Data

A catch-all phrase for computer data created during a biometric process. It encompasses raw sensor observations, biometric samples, models, templates and/or similarity scores. Biometric data is used to describe the information collected during an enrollment, verification, or identification process, but does not apply to end user information such as user name, demographic information and authorizations.

Biometric Sample

Information or computer data obtained from a biometric sensor device. Examples are images of a face or fingerprint.

Biometric System

Multiple individual components (such as sensor, matching algorithm, and result display) that combine to make a fully operational system. A biometric system is an automated system capable of:

1. Capturing a biometric sample from an end user
2. Extracting and processing the biometric data from that sample
3. Storing the extracted information in a database
4. Comparing the biometric data with data contained in one or more reference references
5. Deciding how well they match and indicating whether or not an identification or verification of identity has been achieved.

A biometric system may be a component of a larger system.

Capture

The process of collecting a biometric sample from an individual via a sensor. *See also submission.*

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