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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 2382-37 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 37, *Biometrics*.

ISO/IEC 2382 consists of a total of 37 parts, under the general title *Information technology — Vocabulary.*

Introduction

The main purpose of this part of ISO/IEC 2382 is to provide a systematic description of the concepts in the subject field of biometrics and to clarify the use of the terms in this subject field. The subject field of biometrics is broken down into sub-fields.

This part of ISO/IEC 2382 is addressed to biometrics standardizers, and to users of these standards.

Terms defined in this document are to be understood in the subject field of biometrics. When terms exist in various subject fields, the current subject field may be indicated in angle brackets.

Words in **bold** are defined in this document. Words that are not in bold are to be understood in their natural language sense. The authority for natural language use of terms in this document is the Concise Oxford English Dictionary (COD), Thumb Index Edition (tenth edition, revised, 2002). Words used in their natural language sense are considered out-of-scope for further definition in this document.

EXAMPLE
candidate
<biometrics> **biometric reference identifier** of a **biometric reference** in the **biometric reference database** determined to be similar to the **biometric probe**

candidate
<politics> a person who applies for a job or is nominated for election

Note: When using terms defined with a qualifier (for example, “biometric xxx”), it should be normal to include the qualifier on the first occurrence of the term in every paragraph, but to omit it on subsequent occurrences of that term within the same paragraph. In broader contexts, where the qualifier (in this case, ‘biometric’) is clearly understood, then the qualifier might be omitted completely.

The terms in this part of ISO/IEC 2382 are listed in a systematic order under a number of general headings.

The layout follows the directions given in ISO 10241. Thus, the elements of an entry appear in the following order:

- Entry number (mandatory)
- Preferred term(s) (mandatory)
- Admitted term(s) (mandatory)
- Deprecated term(s)
- Definition
- Example(s)
- Note(s)

To clarify in which grammatical context a term is defined the following indicators are used: (n) for a noun, (v) for a verb and (adj) for an adjective.

The alphabetical index includes preferred and admitted terms.

Information technology — Vocabulary —

Part 37:
Biometrics

1 Scope

This part of ISO/IEC 2382 establishes a systematic description of the concepts in the field of biometrics pertaining to recognition of human beings and reconciles variant terms in use in pre-existing biometric standards against the preferred terms, thereby clarifying the use of terms in this field.

Excluded from the scope of this document are concepts (represented by terms) from information technology, pattern recognition, biology, mathematics, etc. Biometrics uses such fields of knowledge as a basis.

In principle, mode specific terms are outside the scope of this part of ISO/IEC 2382.

Words in **bold** are defined in this document. Words that are not in bold are to be understood in their natural language sense. The authority for natural language use of terms in this document is the Concise Oxford English Dictionary (COD), Thumb Index Edition (tenth edition, revised, 2002). Words used in their natural language sense are considered out-of-scope for further definition in this document.

2 Normative references

There are no normative references.

3 Biometric vocabulary

3.1 General concept terms

37.01.01
biometric (adj)
of or having to do with **biometrics**

NOTE The use of **biometric** as a noun, to mean for example, **biometric characteristic**, is deprecated.

- EXAMPLE 1 Incorrect usage #1: ICAO resolved that face is the **biometric** most suited to the practicalities of travel documents.
- EXAMPLE 2 Correct usage #1: ICAO resolved that face recognition is the **biometric mode** most suited to the practicalities of travel documents.
- EXAMPLE 3 Incorrect usage #2: The **biometric** recorded in my passport is a facial image.
- EXAMPLE 4 Correct usage #2: The **biometric characteristic** recorded in my passport is a facial image.

37.01.02
biometric characteristic
biometric (deprecated)
biological and behavioural characteristic of an individual from which distinguishing, repeatable **biometric features** can be extracted for the purpose of **biometric recognition**

EXAMPLE Examples of **biometric characteristics** are: Galton ridge structure, face topography, facial skin texture, hand topography, finger topography, iris structure, vein structure of the hand, ridge structure of the palm, retinal pattern, handwritten signature dynamics, etc.

NOTE 1 Biological and behavioural characteristics are physical properties of body parts, physiological and behavioural processes created by the body and combinations of any of these.

NOTE 2 Distinguishing does not necessarily imply individualization.

37.01.03
biometric recognition
biometrics
automated recognition of individuals based on their biological and behavioural characteristics

NOTE 1 In the field of **biometrics** (as defined in this document), “Individual" is restricted in scope to refer only to humans.

NOTE 2 The general meaning of **biometrics** encompasses counting, measuring and statistical analysis of any kind of data in the biological sciences including the relevant medical sciences.

NOTE 3 **Biometric recognition** encompasses **biometric verification** and **biometric identification.**

NOTE 4 Automated recognition implies that a machine based system is used for the recognition either for the full process or assisted by a human being.

NOTE 5 Biological and behavioural characteristics cannot be completely separated which is why the definition uses ‘and’ instead of ‘and/or’. For example, a fingerprint image results from the biological characteristics of the finger ridge patterns and the behavioural act of presenting the finger.

NOTE 6 Use of 'authentication' as a synonym for “**biometric verification** or **biometric identification**” is deprecated; the term **biometric recognition** is preferred.

3.2 Biometric system terms

37.02.01
biometric capture subsystem
biometric capture device(s) and any sub-processes required to execute a **biometric capture process**

EXAMPLE In some systems, converting a signal from a **biometric characteristic** to a **captured biometric sample** may include multiple components such as a camera, photographic paper, printer, digital scanner, ink and paper.

NOTE A **biometric capture subsystem** can consist of only a single **biometric capture device**.

37.02.02
biometric identification system
system that aims to perform **biometric identification**

37.02.03
biometric system
system for the purpose of the **biometric recognition** of individuals based on their behavioural and biological characteristics

NOTE A **biometric system** will contain both **biometric** and non-biometric components.

37.02.04
biometric verification system
system that aims to perform **biometric verification**

37.02.05
mode
combination of a **biometric characteristic** type, a sensor type and a processing method

NOTE 1 The processing algorithm may contain multiple methods, details of which may not be externally apparent. Thus a **biometric system** is considered as using one processing method, until it is otherwise specified.

NOTE 2 Determining what constitutes a single type of sensor, processing method or **biometric characteristic** will depend on convention. For example, current convention is that images of ridge patterns from both thumbs and fingers constitute a single **biometric characteristic** type, i.e., fingerprints. With respect to sensors, infrared and optical bandwidth sensors are considered different types, but optical bandwidth sensors are considered a single type despite imaging red, green and blue bandwidths.

37.02.06
multi-modal
multiple in at least 2 out of 3 constituents of a **mode** in a single **biometric system**

NOTE Multiple implies difference in type.

3.3 Terms for data in biometric systems

37.03.01
anonymized biometric data record
biometric data record purposely disassociated from individual metadata

NOTE The **biometric data** within the **biometric data record** ultimately remains attributable to an individual.

37.03.02
biometric application database
database of **biometric data** and associated metadata developed from and supporting the operation of a **biometric application**

NOTE 1 The metadata may include transaction history; authorisations (e.g. age) of **biometric data subjects**; and archived **biometric data**.

NOTE 2 The term application includes the policies that govern the operation of the system and evidence of that operation.

37.03.03
biometric application decision
decision to perform an action at the application level based on the results of a **biometric** process

NOTE 1 The application decision may include more than a comparison process. For example, a **biometric capture process** may show that there are no characteristics to capture and a decision can be made on this before any **biometrics** are compared.

NOTE 2 **Biometric application decisions** can be made on the basis of complex policies involving both **biometric** and non-biometric data.

37.03.04
biometric candidate
biometric reference identifier of a **biometric reference** in the **biometric reference database** determined to be sufficiently similar to the **biometric probe** to warrant further analysis

37.03.05
biometric candidate list
set of zero, one or more **biometric candidates** that may be intermediate or final

NOTE 1 Intermediate **biometric candidate lists** may be produced by systems that use multi-pass **biometric identification**.

NOTE 2 **Biometric candidate lists** may or may not be ordered.

37.03.06
biometric data
biometric sample or aggregation of biometric samples at any stage of processing, e.g. **biometric reference**, **biometric probe**, **biometric feature** or **biometric property**

NOTE Biometric data need not be attributable to a specific individual, e.g. Universal Background Models.

37.03.07
biometric database
database of **biometric data record(s)**

37.03.08
biometric data record
data record containing **biometric data**

NOTE A **biometric data record** may include **non-biometric data**.

37.03.09
biometric enrolment database
database of **biometric enrolment data record(s)**

NOTE 1 A database of biometric data not attributable to biometric data subjects is a biometric database, but not a biometric enrolment database. e.g. a universal background model.

NOTE 2 The **biometric enrolment database** may or may not contain the **biometric reference database**. Separation of the databases may be required due to security, privacy, legislation, architecture, performance, etc.

NOTE 3 A single **biometric reference** (e.g. a fingerprint on a storage card) may be considered as a **biometric enrolment database** in some transactions.

37.03.10
biometric enrolment data record
data record attributed to a **biometric data subject**, containing non-biometric data and associated with **biometric reference identifier**(s)

NOTE 1 Data can be updated after enrolment.

NOTE 2 The **biometric enrolment data record** will either contain biometric reference data record(s) or pointer(s) to biometric reference data record(s).

NOTE 3 The associated **biometric reference** may be NULL (for example, **biometric enrollee** lacks the **biometric characteristic** or **biometric capture** is pending).

37.03.11
biometric feature
numbers or labels extracted from **biometric samples** and used for comparison

NOTE 1 **Biometric features** are the output of a completed **biometric feature extraction**.

NOTE 2 The use of this term should be consistent with its use by the pattern recognition and mathematics communities.

NOTE 3 A **biometric feature** set can also be considered a processed **biometric sample**.

NOTE 4 **Biometric features** may be extracted from an intermediate **biometric sample**.

NOTE 5 Filters applied to **biometric samples** are not themselves **biometric features**, however the output of the filter applied to these samples may be. Therefore, for example, eigenfaces are not **biometric features**.

37.03.12
biometric identification decision
comparison decision as to whether a **biometric reference(s)** of a particular **biometric data subject** is in a **biometric reference database**

NOTE 1 Return of a **biometric candidate list** is not considered a **biometric identification decision**.

NOTE 2 A positive **biometric identification** process is inferred from the output of a **biometric reference identifier**.

37.03.13
biometric model
stored function generated from biometric data

EXAMPLE Examples of **biometric models** could be a Hidden Markov Model, Gaussian Mixture Model or an Artificial Neural Network.

NOTE 1 In most occasions the **biometric model** is a stored function which is dependent on the **biometric data subject**.

NOTE 2 The function may be determined through training.

NOTE 3 A **biometric model** may involve intermediate processing similar to **biometric feature extraction.**

37.03.14
biometric probe
biometric query
biometric sample or **biometric feature** set input to an algorithm for use as the subject of **biometric comparison** to a **biometric reference(s)**

NOTE 1 The term comparison refers to comparison in the biometric sense.

NOTE 2 The subject/object labeling in a comparison might be arbitrary. In some comparisons a **biometric reference** might be used as the subject of the comparison with other **biometric references** or incoming samples used as the objects of the comparisons. For example, in a duplicate enrolment check a **biometric reference** will be used as the subject for comparison against all other **biometric references** in the database.

NOTE 3 Typically in a biometric comparison process, incoming biometric samples serve as the subject of comparison against objects stored as biometric references in a database.

37.03.15
biometric property
descriptive attributes of the **biometric data subject** estimated or derived from the **biometric sample** by automated means

EXAMPLE Fingerprints can be classified by the biometric properties of ridge-flow, i.e. arch, whorl, and loop types. In the case of facial recognition, this could be estimates of age or gender.

37.03.16
biometric reference
one or more stored **biometric samples**, **biometric templates** or **biometric models** attributed to a **biometric data subject** and used as the object of biometric comparison

EXAMPLE Face image stored digitally on a passport; fingerprint minutiae template on a National ID card or Gaussian Mixture Model for speaker recognition stored in a database.