FINAL
DRAFT

INTERNATIONAL STANDARD

ISO/IEC FDIS 2382-37

Information technology — Vocabulary —

Part 37:
Biometrics

Technologies de l'information — Vocabulaire —

Partie 37: Biométrie

Reference number
ISO/IEC FDIS 2382-37:2021(E)

© ISO/IEC 2021

iTeh STANDARD PREVIEW
(standards.iteh.ai)

COPYRIGHT PROTECTED DOCUMENT

Contents

iTeh STANDARD PREVIEW
(standards.iteh.ai)

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see https://patents.iec.ch).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

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

This third edition cancels and replaces the second edition (ISO/IEC 2382-37:2017), which has been technically revised.

The main changes are as follows:

— modifications to some of the terms published in the 2017 edition; and

— addition of new terms.

A list of all parts in the ISO/IEC 2382 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

Introduction

The main purpose of this document 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 document is addressed to biometrics standardizers and to users of these standards.

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

Words that are written in italics are defined in this document. Words that are written in upright font 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 (COED), Thumb Index Edition (tenth edition, revised, 2002).

The numbering of all terms in this document begins with "37" to indicate the Subcommittee of ISO/IEC Joint Technical Committee that created the terms. This is consistent will all other parts of the ISO/IEC 2382 series. The subsequent numerical heading for each entry within this document (37.xx) represents the number of the highest-level category in our concept map in which the term primarily falls. This is consistent with "Systematic Order" as described in ISO 10241-1:2011, 5.1.2, in which the heading reflects the concept system. In the first edition of this document (ISO/IEC 2382-37:2012), the third numerical designator (37.xx.yy) was also consistent with "Systematic Order", moving from most general to more specific terms within each highest-level category of the concept map. With the development of the current edition of this document (ISO/IEC 2382-37:2021), the decision was made to append the new terms in each category such that the numbering of the earlier terms inherited from the 2012 edition would not change. This implies that the third numerical designator is now in "Mixed Order" as described in ISO 10241-1:2011, 5.1.3.

So, words are added to this document in batches for each updated version. These words are added in alphabetical order. This ensures that the numbers allocated to a term remain the same and that they can be referred to consistently.

The terms in this document are listed under a number of general headings.

The layout follows the directions given in ISO 10241-1. Thus, the elements of an entry appear in the following order:

— Entry number (mandatory)

— Preferred term(s) (mandatory)

— Admitted term(s)

— Deprecated term(s)

— Definition (mandatory)

— Example(s)

— Note(s) to entry.

The alphabetical index includes preferred and admitted terms.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Information technology — Vocabulary —

Part 37: Biometrics

1 Scope

This document establishes a systematic description of the concepts in the field of biometrics pertaining to recognition of human beings. This document also reconciles variant terms in use in pre-existing International Standards on biometrics against the preferred terms, thereby clarifying the use of terms in this field.

This document does not cover 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 of scope of this document.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 Terms related to general concepts

37.01.01
biometric, adj
of or having to do with *biometrics* ([37.01.03](#))

Note 1 to entry: The use of biometric as a noun, to mean for example, *biometric characteristic* (37.01.02*)*, 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* ([37.02.05](#)) 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.

Note 2 to entry: Since the late 19th century the terms biometrics and biometry have been used with the general meaning of counting, measuring and statistical analysis of any kind of data in the biological sciences including the relevant medical sciences.

37.01.02
biometric characteristic
DEPRECATED biometric
biological and behavioural characteristic of an individual from which distinguishing, repeatable *biometric features* ([37.03.11](#)) can be extracted for the purpose of *biometric recognition* ([37.01.03](#))

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.

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

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

Note 2 to entry: 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 to entry: Biometric recognition encompasses *biometric verification* ([37.08.03](#)) and *biometric identification* ([37.08.02](#)).

Note 4 to entry: 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 to entry: Behavioural and biological 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 to entry: Use of 'authentication' as a synonym for "biometric verification or biometric identification" is deprecated; the term biometric recognition is preferred.

3.2   Terms related to biometric systems

37.02.01
biometric capture subsystem
biometric capture devices ([37.04.01](#)) and any sub-processes required to execute a *biometric capture process* ([37.05.02](#))

Note 1 to entry: In some *biometric systems* ([37.02.03](#)), converting a signal from a *biometric characteristic* (37.01.02) to a *captured biometric sample* ([37.03.25](#)) can include multiple components such as a camera, photographic paper, printer, digital scanner, ink and paper.

Note 2 to entry: 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* ([37.08.02](#))

37.02.03
biometric system
system for the purpose of the *biometric recognition* ([37.01.03](#)) of individuals based on their behavioural and biological characteristics

Note 1 to entry: A biometric system will contain both *biometric* ([37.01.01](#)) and non-biometric components.

37.02.04
biometric verification system
system that aims to perform *biometric verification* ([37.08.03](#))

37.02.05
mode
DEPRECATED biometric, noun
combination of a *biometric characteristic* (37.01.02) type, a sensor type and a processing method

Note 1 to entry: The processing algorithm may contain multiple methods, details of which are not necessarily externally apparent. Thus, a *biometric system* (37.02.03) is considered as using one processing method, until it is otherwise specified.

Note 2 to entry: 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 represent 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
multimodal
multiple in at least two out of three constituents of a *mode* (37.02.05) in a single *biometric system* (37.02.03)

Note 1 to entry: Multiple implies difference in type.

37.02.07
system participation ratio
proportion of individuals eligible to use the system who do use the system

Note 1 to entry: Enrolled individuals are a subset of eligible individuals.

Note 2 to entry: This term is used to express the extent of take-up and use of a *biometric system* (37.02.03).

37.02.08
biometric fusion
combination of *biometric* (37.01.01) information from different sources to inform a *comparison decision* (37.03.26) within a biometric *transaction* (37.06.45)

Note 1 to entry: The sources might be at the signal, feature, score, rank or decision level.

37.02.09
monobiometric system
biometric system (37.02.03) of which all of the following components are required to be singular: *biometric capture subsystem* (37.02.01), *biometric instance* (37.03.46), *biometric characteristic* (37.01.02) type*, biometric algorithm* (37.04.02) and *biometric presentation* (37.06.07)

Note 1 to entry: This term is needed for completeness. It can be the case that few systems are monobiometric, as multiple instances and multipresentations are normally allowed.

37.02.10
multibiometric system
biometric system (37.02.03) of which at least one of the following components is required to be multiple: *biometric capture subsystem* (37.02.01), *biometric instance* (37.03.46), *biometric characteristic* (37.01.02) type, *biometric algorithm* (37.04.02) or *biometric presentation* (37.06.07)

37.02.11
multipresentation system
system that accepts multiple interactions of the *biometric capture subject* (37.07.03) with the *biometric capture subsystem* (37.02.01) to obtain signals from a *biometric characteristic* (37.01.02) needed for a single *transaction* (37.06.45)

Note 1 to entry: The interaction is seen from the perspective of the biometric capture subject.

37.02.12
multibiometric, adj
based on multiple types of *biometric characteristics* ([37.01.02](#))

EXAMPLE   A biometric system that is based on two or more biometric characteristic types such as two or more of face, voice, finger, iris, retina, hand geometry, signature/sign, keystroke, lip movement, gait, vein, DNA, ear, foot, scent, etc.

3.3   Terms related to data in biometric systems

37.03.01
anonymized biometric data record
biometric data record ([37.03.08](#)) purposely disassociated from individual metadata

Note 1 to entry: The *biometric data* ([37.03.06](#)) within the biometric data record ultimately remains attributable to an individual.

37.03.02
biometric application database
database of *biometric data* ([37.03.06](#)) and associated metadata developed from and supporting the operation of a *biometric* ([37.01.01](#)) application

Note 1 to entry: The metadata may include *transaction* ([37.06.45](#)) history; authorizations (e.g. age) of the *biometric data subject* ([37.07.05](#)); and archived biometric data.

Note 2 to entry: The term application includes the policies that govern the operation of the *biometric system* ([37.02.03](#)) 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* ([37.01.01](#)) process

Note 1 to entry: The application decision may include more than a *comparison* ([37.05.07](#)) process. For example, a *biometric capture process* ([37.05.02](#)) may show that there are no *biometric characteristics* ([37.01.02](#)) to capture and a decision can be made on this before any biometric characteristics are compared.

Note 2 to entry: *Biometric application decisions* can be made on the basis of complex policies involving both *biometric data* ([37.03.06](#)) and non-biometric data.

37.03.04
biometric candidate
biometric reference identifier ([37.03.19](#)) of a *biometric reference* ([37.03.16](#)) in the *biometric reference database* ([37.03.17](#)) determined to be sufficiently similar to the *biometric probe* ([37.03.14](#)) to warrant further analysis

Note 1 to entry: Identification systems can be configured to return a fixed number of the most similar candidates and, in other cases, the system could be configured to return candidates with *biometric candidate scores* ([37.03.24](#)) that exceed a *threshold* ([37.03.36](#)).

37.03.05
biometric candidate list
set of zero, one or more *biometric candidates* ([37.03.04](#))

Note 1 to entry: The biometric candidate list can be tentative if it is to be reduced by further processing.

37.03.06
biometric data
biometric sample ([37.03.21](#)) or aggregation of biometric samples at any stage of processing

EXAMPLE   *Biometric reference* ([37.03.16](#)), *biometric probe* ([37.03.14](#)), *biometric feature* ([37.03.11](#)) or *biometric property* ([37.03.15](#)).

Note 1 to entry: 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)

37.03.08
biometric data record
data record containing *biometric data* (37.03.06)

Note 1 to entry: A biometric data record may include non-biometric data.

37.03.09
biometric enrolment database
database of *biometric enrolment data record(s)* (37.03.10)

Note 1 to entry: A database of *biometric data* (37.03.06) not attributable to *biometric data subjects* (37.07.05) is a *biometric database* (37.03.07), but not a biometric enrolment database, e.g. data for Universal Background Models.

Note 2 to entry: The biometric enrolment database can optionally contain the *biometric reference database* (37.03.17). Separation of the databases can be required due to security, privacy, legislation, architecture, performance, etc.

Note 3 to entry: A single *biometric reference* (37.03.16) (e.g. a fingerprint on a storage card) can be considered as a biometric enrolment database in some *transactions* (37.06.45).

37.03.10
biometric enrolment data record
data record attributed to a *biometric data subject* (37.07.05)**,** containing non-biometric data and associated with *biometric reference identifier(s)* (37.03.19)

Note 1 to entry: Data can be updated after enrolment.

Note 2 to entry: The biometric enrolment data record will either contain *biometric reference data record(s)* (37.03.18) or pointer(s) to biometric reference data record(s).

Note 3 to entry: The associated *biometric reference* (37.03.16) can be null (for example, *biometric enrollee* (37.07.06) lacks the *biometric characteristic* (37.01.02) or *biometric capture process* (37.05.02) is pending.

37.03.11
biometric feature
number or label extracted from *biometric samples* (37.03.21) and used for *comparison* (37.05.07)

Note 1 to entry: The set of numbers or labels are the output of a completed *biometric feature extraction* (37.05.04)**.**

Note 2 to entry: The use of this term should be consistent with its use by the pattern recognition and mathematics communities.

Note 3 to entry: A biometric feature set can also be considered a processed biometric sample.

Note 4 to entry: Biometric features may be extracted from an *intermediate biometric sample* (37.03.30).

Note 5 to entry: Filters applied to biometric samples are not themselves biometric features. However, the output of the filter applied to the biometric samples can be. Therefore, eigenfaces are not biometric features, for example.

37.03.12
biometric identification decision
comparison decision (37.03.26) as to whether a *biometric reference(s)* (37.03.16) of a particular *biometric data subject* (37.07.05) is in a *biometric reference database* (37.03.17)

Note 1 to entry: Return of a *biometric candidate list* (37.03.05) is not considered a biometric identification decision.

Note 2 to entry: A positive *biometric identification* (37.08.02) process is inferred from the output of a *biometric reference identifier* (37.03.19).

37.03.13
biometric model
stored function generated from *biometric data* (37.03.06)

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

Note 1 to entry: In most occasions the biometric model is a stored function which is dependent on the *biometric data subject* (37.07.05).

Note 2 to entry: The function may be determined through training.

Note 3 to entry: A biometric model may involve intermediate processing similar to *biometric feature extraction* (37.05.04).

37.03.14
biometric probe
biometric query
biometric sample (37.03.21) or *biometric feature* (37.03.11) set input to an algorithm for *comparison* (37.05.07) to a *biometric reference(s)* (37.03.16)

Note 1 to entry: In some comparisons a biometric reference might be used as the subject of the comparison with other biometric references or incoming biometric samples used as the objects of the comparison*s*. For example, in a duplicate enrolment check a biometric reference will be used as the subject for comparisons against all other biometric references in the database.

Note 2 to entry: Typically, in a comparison process, incoming biometric samples serve as the subject of comparison*s* against objects stored as biometric references in a database.

37.03.15
biometric property
descriptive attributes of the *biometric data subject* (37.07.05) estimated or derived from the *biometric sample* (37.03.21) by automated means

EXAMPLE   Fingerprints can be classified by the biometric properties of ridge-flow, i.e. arch, whorl and loop types. Estimates of age or *gender* (37.07.31) from face recognition would also be biometric properties.

37.03.16
biometric reference
one or more stored *biometric samples* (37.03.21), *biometric templates* (37.03.22) or *biometric models* (37.03.13) attributed to a *biometric data subject* (37.07.05) and used as the object of biometric *comparison* (37.05.07)

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

Note 1 to entry: A biometric reference may be created with implicit or explicit use of auxiliary data, such as Universal Background Models.

Note 2 to entry: The subject/object labelling in a comparison can be arbitrary. In some comparisons a biometric reference might be used as the subject of the comparison with other biometric references or incoming biometric samples and input to a *biometric algorithm* (37.04.02) for comparison. 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.

37.03.17
biometric reference database
database of *biometric reference data records* (37.03.18)

Note 1 to entry: The biometric reference database may be a subset of the *biometric enrolment database* (37.03.09), or it may be a separate database. Separation of the databases may be required due to security, privacy, legislation, architecture, performance, etc.

37.03.18
biometric reference data record
indexed data record containing *biometric reference(s)* (37.03.16)

Note 1 to entry: There is not necessarily a one to one correspondence between biometric reference data records and *biometric data subjects* (37.07.05). For example, a single biometric data subject can have several reference data records and in some applications a single biometric reference data record can be associated with multiple enrolments of a biometric data subject.

37.03.19
biometric reference identifier
pointer to a *biometric reference data record* (37.03.18) in the *biometric reference database* (37.03.17)

37.03.20
biometric representation
biometric sample (37.03.21) or *biometric feature* (37.03.11) set

Note 1 to entry: This term is used in the ISO/IEC 19794 series and the ISO/IEC 39794 series for labelling a sub-record in a *biometric data record* (37.03.08).

37.03.21
biometric sample
analogue or digital representation of *biometric characteristics* (37.01.02) prior to *biometric feature extraction* (37.05.04)

EXAMPLE   A record containing the image of a finger is a biometric sample.

37.03.22
biometric template
reference biometric feature set
set of stored *biometric features* (37.03.11) comparable directly to a *biometric probe* (37.03.14)

EXAMPLE   A record containing a set of finger minutiae is a biometric template.

Note 1 to entry: A *biometric reference* (37.03.16) consisting of an image, or other *captured biometric sample* (37.03.25), in its original, enhanced or compressed form, is not a biometric template.

Note 2 to entry: The *biometric features* (37.03.11) are not considered to be a biometric template unless they are stored for reference.

37.03.23
biometric verification decision
comparison decision (37.03.26) determining the validity of a *biometric claim* (37.06.04) in a *verification transaction* (37.06.21)

37.03.24
biometric candidate score
comparison score (37.03.27) for a *biometric candidate* (37.03.04)

37.03.25
captured biometric sample
DEPRECATED raw biometric sample
biometric sample (37.03.21) resulting from a *biometric capture process* (37.05.02)