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Part 7: Signature/sign time series data

Technologies de l'information — Formats d'échange de données biométriques —

Partie 7: Données de série chronologique de signature/signe

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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.

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 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 19794-7:2014), which has been technically revised. It also incorporates the Amendment ISO/IEC 19794-7:2014/Amd 1:2015.

The main changes are as follows:

— inclusion of ISO/IEC 19794-7:2014/Amd 1:2015, *XML encoding*, and correction of technical defects therein.

A list of all parts in the ISO/IEC 19794 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.

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Information technology — Biometric data interchange formats —

Part 7: Signature/sign time series data

1 Scope

This document specifies data interchange formats for signature/sign behavioural data captured in the form of a multi-dimensional time series using devices such as digitizing tablets or advanced pen systems. The data interchange formats are generic, in that they can be applied and used in a wide range of application areas where handwritten signs or signatures are involved. No application-specific requirements or features are addressed in this document.

This document contains:

— a description of what data can be captured;

— three binary data formats for containing the data: a full format for general use, a compression format capable of holding the same amount of information as the full format but in compressed form, and a compact format for use with smart cards and other tokens that does not require compression/decompression but conveys less information than the full format;

— an XML schema definition; and

— examples of data record contents and best practices in capture.

Specifying which of the format types and which options defined in this document are to be applied in a particular application is out of scope; this needs to be defined in application-specific requirements specifications or application profiles.

It is advisable that cryptographic techniques be used to protect the authenticity, integrity, and confidentiality of stored and transmitted biometric data; yet such provisions are beyond the scope of this document.

This document also specifies elements of conformance testing methodology, test assertions and test procedures as applicable to this document. It establishes test assertions on the structure and internal consistency of the signature/sign time series data formats defined in this document (type A level 1 and 2 as defined in ISO/IEC 19794-1) and semantic test assertions (type A level 3 as defined in ISO/IEC 19794-1).

The conformance testing methodology specified in this document does not establish:

— tests of other characteristics of biometric products or other types of testing of biometric products (e.g. acceptance, performance, robustness, security); or

— tests of conformance of systems that do not produce data records claimed to conform to the requirements of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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ISO/IEC 8825-1, *Information technology — ASN.1 encoding rules — Part 1: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*

ISO/IEC 19794-1, *Information technology — Biometric data interchange formats — Part 1: Framework*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19794-1 and the following apply.

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
channel
data item (captured, intermediate, or processed) recorded in form of a time series

EXAMPLE Pen tip position *x* and *y* coordinates, pen tip force, *pen tilt along the x-axis* (3.7), *pen tilt along the y-axis* (3.8), *pen azimuth* (3.3), *pen elevation* (3.5), *pen rotation* (3.6).

3.2
compression
process that reduces the size of a digital file with or without loss of information

Note 1 to entry: The compression format defined in Clause 10 includes data compressed by lossless compression schemes.

3.3
pen azimuth
angle measured clockwise from the positive *y*-axis to the perpendicular projection of the pen onto the writing plane

Note 1 to entry: The pen azimuth may range from 0° to 360°.

3.4
pen-down event
event from which on the pen tip is touching the writing plane

3.5
pen elevation
angle between the perpendicular projection of the pen onto the writing plane and the pen

Note 1 to entry: The pen elevation may range from 0° to 90°.

3.6
pen rotation
angle of the rotation of the pen about its longitudinal axis measured counter-clockwise from a device-specific rotational reference position

Note 1 to entry: The pen rotation may range from 0° to 360°.

3.7
pen tilt along the *x*-axis
angle measured clockwise from the positive *z*-axis to the perpendicular projection of the pen onto the *xz* plane

Note 1 to entry: The pen tilt along the *x*-axis may range from –90° to +90°.

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3.8
pen tilt along the *y*-axis
angle measured clockwise from the positive *z*-axis to the perpendicular projection of the pen onto the *yz* plane

Note 1 to entry: The pen tilt along the *y*-axis may range from –90° to +90°.

3.9
pen-up event
event from which on the pen tip is not touching the writing plane, after a *pen-down event* (3.4)

3.10
sampling rate
number of samples per second (or per another unit) taken from a continuous signal to make a discrete signal

3.11
signature/sign representation
data recorded from a single signature/sign

3.12
***x* jitter**
sample standard deviation of at least 100 *x*-coordinate samples from a stationary pen

3.13
***y* jitter**
sample standard deviation of at least 100 *y*-coordinate samples from a stationary pen

3.14
***x* pixel density**
number of dots per millimetre that the capture device resolves in the *x* (horizontal) direction

3.15
***y* pixel density**
number of dots per millimetre that the capture device resolves in the *y* (vertical) direction

4 Abbreviated terms

ASCII	American Standard Code for Information Interchange
BDB	biometric data block
BDIR	biometric data interchange record
BHT	biometric header template
BIR	biometric information record
BIT	biometric information template
CBEFF	Common Biometric Exchange Formats Framework
IBIA	International Biometrics & Identification Association
ICS	implementation conformance statement
lsb	least significant bit
msb	most significant bit

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