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Information technology — Biometric data interchange formats —

Part 4: Finger image data

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

Partie 4: Données d'image du doigt

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Contents

Page

Foreword v
Introduction vi
1 Scope 1
2 Conformance 1
3 Normative references 1
4 Terms and definitions 1
5 Abbreviated terms 3
6 Data conventions 3
6.1 Byte and bit ordering 3
6.2 Scan sequence 3
7 Image acquisition requirements 4
7.1 General 4
7.2 Pixel aspect ratio 4
7.3 Pixel depth 5
7.4 Grayscale data 5
7.5 Dynamic range 5
7.6 Scan resolution 6
7.7 Image resolution 6
7.8 Fingerprint image location 6
8 Finger image record format 6
8.1 Record structure 6
8.2 General record header 7
8.2.1 Required fields 7
8.2.2 Format identifier 7
8.2.3 Version number 8
8.2.4 Record length 8
8.2.5 Capture device ID 8
8.2.6 Image acquisition level 8
8.2.7 Number of finger/palm images 8
8.2.8 Scale units 8
8.2.9 Scan resolution (horizontal) 8
8.2.10 Scan resolution (vertical) 8
8.2.11 Image resolution (horizontal) 8
8.2.12 Image resolution (vertical) 9
8.2.13 Pixel depth 9
8.2.14 Image compression algorithm 9
8.2.15 Reserved 9
8.3 Finger record header 10
8.3.1 Required fields 10
8.3.2 Length of finger/palm data block 10
8.3.3 Finger/palm position 10
8.3.4 Count of views 11
8.3.5 View number 12
8.3.6 Finger/palm image quality 12
8.3.7 Impression type 12
8.3.8 Horizontal line length 12
8.3.9 Vertical line length 12
8.3.10 Finger/palm image data 12

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Annex A (normative) **Image quality specifications** **13**
A.1 Scope and purpose **13**
A.2 Fingerprint scanners **13**
A.2.1 Geometric image accuracy **13**
A.2.2 Modulation transfer function **14**
A.2.3 Signal-to-noise ratio **14**
A.2.4 Grayscale range of image data **15**
A.2.5 Grayscale linearity **16**
A.2.6 Output gray level uniformity **16**
A.3 Latent print scanners **16**
A.3.1 Geometric image accuracy **17**
A.3.2 Modulation transfer function **17**
Annex B (informative) **Finger image data record example** **19**
Bibliography **21**

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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 19794-4 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 37, *Biometrics*.

ISO/IEC 19794 consists of the following parts, under the general title *Information technology — Biometric data interchange formats*:

— *Part 1: Framework*

— *Part 2: Finger minutiae data*

— *Part 3: Finger pattern spectral data*

— *Part 4: Finger image data*

— *Part 5: Face image data*

— *Part 6: Iris image data*

The following parts are under preparation:

— *Part 7: Signature/sign behavioral data*

— *Part 8: Finger pattern skeletal data*

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Introduction

In the forensic community, the capture and transmission of fingerprint images has been a common choice for the exchange of fingerprint information used by Automatic Fingerprint Identification Systems (AFIS) for the identification of individuals. However, little to no fingerprint information is being exchanged between equipment from different vendors in the biometric user verification and access community. This has been due in part to the lack of agreement between vendors on the amount and type of information to capture, the method of capture, and the information to be exchanged.

This part of the ISO/IEC 19794 standard is intended for those applications requiring the exchange of raw or processed fingerprint images that may not necessarily be limited by the amount of resources required for data storage or transmitting time. It can be used for the exchange of scanned fingerprints containing detailed image pixel information. This part of ISO/IEC 19794 can also be used to exchange processed fingerprint image data containing considerably fewer pixels per inch and/or a lesser number of greyscale levels. This is in contrast to other parts of ISO/IEC 19794 used for exchanging lists of fingerprint characteristics such as minutiae, patterns, or other variants. These formats require considerably less storage than a fingerprint image. However, by using any of the other parts of ISO/IEC 19794, information recorded in one standard format cannot be used by algorithms designed to operate with another type of information. In other words, minutiae data cannot be used by pattern matching algorithms and pattern data cannot be used by minutiae matching algorithms.

Although the minutiae, pattern, or other approaches produce different intermediate outputs, all must initially capture a reasonably high quality fingerprint image before reducing the size of the image (in bytes) or developing a list of characteristic data from the image. Use of the captured or processed image can provide interoperability among vendors relying on minutiae-based, pattern-based or other algorithms. As a result, data from the captured finger image offers the developer more freedom in choosing or combining matching algorithm technology. For example, an enrolment image may be stored on a contactless chip located on an identification document. This will allow future verification of the holder of the document with systems that rely on either minutiae based or pattern based algorithms. Establishment of an image-based representation of fingerprint information will not rely on pre-established definitions of minutiae, patterns or other types. It will provide implementers with the flexibility to accommodate images captured from dissimilar devices, varying image sizes, resolutions, and different grayscale depths. Use of the fingerprint image will allow each vendor to implement their own algorithms to determine whether two fingerprint records are from the same finger.

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Information technology — Biometric data interchange formats —

Part 4: Finger image data

1 Scope

This part of the ISO/IEC 19794 standard specifies a data record interchange format for storing, recording, and transmitting the information from one or more finger or palm image areas within an ISO/IEC 19785-1 CBEFF data structure. This can be used for the exchange and comparison of finger image data. It defines the content, format, and units of measurement for the exchange of finger image data that may be used in the verification or identification process of a subject. The information consists of a variety of mandatory and optional items, including scanning parameters, compressed or uncompressed images and vendor-specific information. This information is intended for interchange among organizations that rely on automated devices and systems for identification or verification purposes based on the information from finger image areas. Information compiled and formatted in accordance with this part of the ISO/IEC 19794 standard can be recorded on machine-readable media or may be transmitted by data communication facilities.

2 Conformance

Systems claiming conformance with this part of the ISO/IEC 19794 standard shall be capable of encoding and decoding finger image data and the associated parameter data used in the transmitting and/or receiving of fingerprint images as defined by this part of the ISO/IEC 19794 standard. At a minimum, conformance shall require the ability to capture, exchange, and compare interoperable fingerprint image information.

3 Normative references

The following referenced documents are indispensable for the application 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.

IAFIS-IC-0110 (V3), WSQ Gray-scale Fingerprint Image Compression Specification 1997

ISO/IEC 19785.1, *Information technology — Common biometric exchange formats framework — Part 1: Data element specification*

ISO/IEC 15444 (all parts), *Information technology — JPEG 2000 image coding system*

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