

Second edition
2011-12-15

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

Reference number
ISO/IEC 19794-4:2011(E)



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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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Contents

Page

Foreword	v
Introduction.....	vi
1 Scope	1
2 Conformance	1
3 Normative references	2
4 Terms and definitions	2
5 Abbreviated terms	3
6 Data conventions.....	3
6.1 Byte and bit ordering	3
6.2 Scan sequence	3
7 Image acquisition requirements	3
7.1 General	3
7.2 Pixel aspect ratio	4
7.3 Bit-depth	4
7.4 Grayscale data	4
7.5 Dynamic range	4
7.6 Capture device spatial sampling rate	4
7.7 Image spatial sampling rate	5
7.8 Fingerprint image location	5
7.9 Palm image location	5
8 Finger image record format.....	5
8.1 Record structure.....	5
8.2 Finger image general header	6
8.3 Finger/palm image representation header	9
8.4 Extended data	18
9 Registered format type identifiers	23
Annex A (normative) Conformance test methodology	24
Annex B (normative) Capture device certifications	25
Annex C (informative) Finger image data record example	49
Annex D (informative) Conditions for capturing finger image data.....	51
Annex E (normative) WSQ Gray-scale fingerprint image compression specification.....	60
Bibliography.....	91

Figures

Figure 1 — Order of scanned lines	4
Figure 2 — Finger image record structure	6
Figure 3 — Order and size of fields in the finger image record.....	7
Figure 4 — Image quality layout.....	13
Figure 5 — Finger orientation for segmentation.....	22

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Tables

Table 1 — General record header	8
Table 2 — Finger image representation header record.....	9
Table 3 — Image and extended data	11
Table 4 — Capture device technology.....	12
Table 5 — Identifiers for certification schemes specified in the annexes.....	14
Table 6 — Finger position codes	15
Table 7 — Multiple finger position codes.....	15
Table 8 — Palm codes.....	16
Table 9 — Compression algorithm codes.....	17
Table 10 — Finger and palm impression codes	18
Table 11 — Extended data area type codes	19
Table 12 — Segmentation data	20
Table 13 — Annotation data	22
Table 14 — Format Type Identifiers	23

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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*.

This second edition cancels and replaces the first edition (ISO/IEC 19794-4:2005). It reflects the harmonization across the second generation of ISO/IEC 19794. Clause 8 has been technically revised and contains descriptions of the harmonized general and representation headers. Annex A is under development and will contain an amendment for conformance testing methodology for this part of ISO/IEC 19794. Annex B contains capture device certifications for capturing finger image data. Annex B has been technically revised. Annex D describes conditions for capturing finger image data, and Annex E contains the WSQ Gray-scale fingerprint image compression specification. The former Annex A "Image Quality Specification" has been removed.

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*
- *Part 7: Signature/sign time series data*
- *Part 8: Finger pattern skeletal data*
- *Part 9: Vascular image data*
- *Part 10: Hand geometry silhouette data*
- *Part 11: Signature/sign processed dynamic data*
- *Part 13: Voice data*
- *Part 14: DNA data*

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.

ISO/IEC 19794 is a series of International Standards being developed by ISO/IEC JTC 1/SC 37 that supports interoperability and data interchange among biometric applications and systems. The series specifies requirements that solve the complexities of applying biometrics to a wide variety of personal recognition applications, whether such applications operate in an open systems environment or consist of a single, closed system. Additional information regarding the series is provided in ISO/IEC 19794-1.

This part of ISO/IEC 19794 is intended for those applications requiring the exchange of raw or processed fingerprint and palm 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 grayscale 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 records cannot be compared with pattern skeletal data comparison subsystems.

Although the minutiae, pattern, or other approaches produce different intermediate outputs, all shall 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 comparison algorithms. 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, spatial sampling rates, 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.