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**Information technology — Biometric data  
interchange formats —**

**Part 8:  
Finger pattern skeletal data**

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

*Partie 8: Données des structures du squelette de l'empreinte*



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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](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

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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 19794-8 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 19794-8:2006), Clauses 6, 7 and 8 and Annex B of which have been technically revised. It also incorporates the Technical Corrigendum ISO/IEC 19794-8:2006/Cor.1:2011.

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*

The following parts are under preparation:

- *Part 13: Voice data*
- *Part 14: DNA data*

## Introduction

With the interest of implementing interoperable personal biometric recognition systems, this part of ISO/IEC 19794 establishes a data interchange format for pattern-based skeletal fingerprint recognition algorithms. Pattern-based algorithms process sections of biometric images. Pattern-based algorithms have been shown to work well with the demanding, but commercially driven, fingerprint sensor formats such as small-area and swipe sensors.

The exchange format defined in this part of ISO/IEC 19794 describes all characteristics of a fingerprint in a small data record. Thus it allows for the extraction of both spectral information (orientation, frequency, phase, etc.) and features (minutiae, core, ridge count, etc.). Transformations like translation and rotation can also be accommodated by the format defined in this part of ISO/IEC 19794.

With this part of ISO/IEC 19794 for pattern-based skeletal representation of fingerprints:

- interoperability among fingerprint recognition vendors based on a small data record is allowed;
- proliferation of low-cost commercial fingerprint sensors with limited coverage, dynamic range, or resolution is supported;
- a data record that can be used to store biometric information on a variety of storage mediums (including, but not limited to, portable devices and smart cards) is defined;
- adoption of biometrics in applications requiring interoperability is encouraged.

Note that it is recommended that biometric data protection techniques in ANSI X9.84 or ISO/IEC 15408 be used to safeguard the biometric data defined in this part of ISO/IEC 19794 for confidentiality, integrity and availability.

# Information technology — Biometric data interchange formats —

## Part 8: Finger pattern skeletal data

### 1 Scope

This part of ISO/IEC 19794 specifies the interchange format for the exchange of pattern-based skeletal fingerprint recognition data. The data format is generic in that it can be applied and used in a wide range of application areas where automated fingerprint recognition is involved.

This part of ISO/IEC 19794 also specifies elements of conformance testing methodology, test assertions, and test procedures as applicable to the interchange format for the exchange of pattern-based skeletal fingerprint recognition data.

This part of ISO/IEC 19794 establishes

- test assertions of the structure of the finger pattern skeletal data format as specified in this part of ISO/IEC 19794 (Type A Level 1 as will be defined in ISO/IEC 19794-1:2011/Amd.2),
- test assertions of internal consistency by checking the types of values that may be contained within each field (Type A Level 2 as will be defined in ISO/IEC 19794-1:2011/Amd.2).

This part of ISO/IEC 19794 does not establish

- test of conformance of CBEFF structures required by this part of ISO/IEC 19794,
- test of consistency with input biometric data record (Level 3),
- test of other characteristics of biometric products or other types of testing of biometric products (e.g. acceptance, performance, robustness, security),
- test of conformance of systems that do not produce ISO/IEC 19794-8 records.

### 2 Conformance

A biometric data record conforms to this part of ISO/IEC 19794 if it satisfies all of the normative requirements related to:

- a) its data structure, data values, and the relationships between its data elements, as specified throughout Clause 7 for the finger pattern skeletal data record format and Clause 8 for the finger pattern skeletal data card format of this part of ISO/IEC 19794;
- b) the relationship between its data values and the input biometric data from which the biometric data record was generated, as specified throughout Clause 7 for the finger pattern skeletal data record format and Clause 8 for the finger pattern skeletal data card format of this part of ISO/IEC 19794.

A system that produces biometric data records is conformant to this part of ISO/IEC 19794 if all biometric data records that it outputs conform to this part of ISO/IEC 19794 (as defined above) as claimed in the Implementation Conformance Statement (ICS) associated with that system. A system does not need to be capable of producing biometric data records that cover all possible aspects of this part of ISO/IEC 19794, but only those that are claimed to be supported by the system in the ICS.

A system that uses biometric data records is conformant to this part of ISO/IEC 19794 if it can read, and use for the purpose intended by that system, all biometric data records that conform to this part of ISO/IEC 19794 (as defined above) as claimed in the ICS associated with that system. A system does not need to be capable of using biometric data records that cover all possible aspects of this part of ISO/IEC 19794, but only those that are claimed to be supported by the system in an ICS.

### 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.

ISO/IEC 19794-1:2011, *Information technology — Biometric data interchange formats — Part 1: Framework*

ISO/IEC 7816-6:2004, *Identification cards — Integrated circuit cards — Part 6: Interindustry data elements for interchange*

ISO/IEC 7816-11:2004, *Identification cards — Integrated circuit cards — Part 11: Personal verification through biometric methods*