

Second edition
2011-12-15

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

Reference number
ISO/IEC 19794-8:2011(E)



This is a preview of "ISO/IEC 19794-8:2011". [Click here to purchase the full version from the ANSI store.](#)



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

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

This is a preview of "ISO/IEC 19794-8:2011". Click here to purchase the full version from the ANSI store.

Contents

Page

Foreword	v
Introduction.....	vi
1 Scope	1
2 Conformance	1
3 Normative references	2
4 Terms and definitions	2
5 Abbreviated terms	2
6 Determination of finger pattern skeletal data	2
6.1 Minutia	3
6.1.1 Minutia type.....	3
6.1.2 Minutia location and coordinate system.....	3
6.1.3 Angle conventions	4
6.1.4 Differences to minutia data in ISO/IEC 19794-2 – Finger minutia data	5
6.2 Encoding the skeleton ridge line by a direction code	5
6.2.1 Direction code.....	5
6.2.2 General skeleton line encoding rules.....	7
6.2.3 Constructing direction elements	7
6.2.4 Direction element length.....	8
6.3 Skeleton line neighbourhood index	10
6.3.1 Adjacent lines	10
6.3.2 Recording the neighbour indices	10
7 Finger pattern skeletal data record format	11
7.1 Introduction.....	11
7.1.1 Pattern record format summary.....	11
7.2 Record organization.....	14
7.3 General header	14
7.3.1 Format identifier	14
7.3.2 Version number	14
7.3.3 Length of total record	14
7.3.4 Number of finger representations	14
7.3.5 Certification flag	14
7.4 Single finger record format	15
7.4.1 Finger Pattern Skeletal Representation Header	15
7.4.2 Finger pattern skeletal data block	19
7.5 Extended data	20
7.5.1 Common extended data fields	20
7.5.2 Ridge count data format	21
7.5.3 Core and delta data format	23
7.5.4 Zonal quality data	25
7.5.5 Sweat pore position data	26
7.5.6 Finger pattern skeleton structural data.....	27
8 Finger pattern skeletal data card format.....	29
8.1 Normal size finger pattern skeletal format.....	29
8.2 Compact size finger pattern skeletal format.....	29
8.3 Finger pattern skeletal data block	30
8.3.1 Skeleton image size in x and y.....	30
8.3.2 Length of finger pattern skeletal data	30
8.3.3 Finger pattern skeletal data.....	30

This is a preview of "ISO/IEC 19794-8:2011". [Click here to purchase the full version from the ANSI store.](#)

8.3.4	Length of skeleton line neighbourhood index data	30
8.3.5	Skeleton line neighbourhood index data	30
8.4	The x or y coordinate extension for compact card format	30
8.5	Usage of additional features for the card format	31
8.6	Comparison parameters and card capabilities.....	31
8.6.1	Maximal data size.....	32
8.6.2	Indication of card capabilities	32
8.7	Pattern card format summary.....	32
9	CBEFF format owner and format types	33
Annex A (normative)	Conformance test methodology.....	34
Annex B (normative)	Capture device certifications.....	35
Annex C (informative)	Examples for finger pattern skeletal data	59
Annex D (informative)	Example data record.....	66
Bibliography	68

This is a preview of "ISO/IEC 19794-8:2011". [Click here to purchase the full version from the ANSI store.](#)

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.