INTERNATIONAL STANDARD

ISO/IEC 19794-3

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Information technology — Biometric data interchange formats —

Part 3: Finger pattern spectral data

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

Partie 3: Données spectrales de la forme du doigt

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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 the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

ISO/IEC 19794-3 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*

— *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*

Introduction

In the interest of implementing interoperable personal biometric recognition systems, this part of ISO/IEC 19794 establishes a data interchange format for finger pattern spectral data. The goal of this part of ISO/IEC 19794 is to allow the exchange of local or global spectral data derived from a fingerprint image without the exchange of the entire image. This will allow more compact data representations.

This part of ISO/IEC 19794 allows for representation of spectral components, such as Discrete Fourier Transform and (single-scale) Gabor Filter components, extracted from global or stationary (not image dependent and not varying over the image) local overlapping or non-overlapping uniform-sized regions of the original intensity (non-color) image. Some or all of the extracted spectral components will be stored in the data format, depending upon the implementation. This part of ISO/IEC 19794 does not accommodate multi-scale (wavelet) decompositions.

There are fingerprint recognition algorithms that use spectral data directly for pattern matching. Spectral data-based recognition algorithms process "globally" local sections (cells) of biometric images, in contrast to morphological-based algorithms, which extract singularities in the morphological features. At the current time, there is no established mechanism for the interchange of finger pattern spectral information for use with spectral-based fingerprint matching algorithms.

By establishing a standard for spectral-based representation of fingerprints, we

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

The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning the quantized co-sinusoidal triplets method of formatting the pattern spectral data. ISO and IEC take no position concerning the evidence, validity and scope of this patent right. The holder of this patent right has assured the ISO and IEC that he/she is willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applications throughout the world. In this respect, the statement of the holder of this patent right is registered with ISO and IEC. Information may be obtained from:

Bioscrypt Inc.
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Markham, Ontario, Canada
L3R 8E3

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Information technology — Biometric data interchange formats —

Part 3: Finger pattern spectral data

1 Scope

This part of ISO/IEC 19794 specifies the interchange format for the exchange of spectral-based fingerprint data.

2 Conformance

A biometric system or algorithm conforms to this part of ISO/IEC 19794 if it satisfies the mandatory requirements for the generation of the finger pattern spectral data as defined in Clause 7 and the generation of the data record as described in Clause 8.

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 19784-1:2006, *Information technology — Biometric application programming interface — Part 1: BioAPI specification*

ISO/IEC 19785-1:2006, *Information technology — Common Biometric Exchange Formats Framework — Part 1: Data element specification*

ANSI/NIST-ITL 1:2000, *Standard Data Format for the Interchange of Fingerprint, Facial, & Scar Mark & Tattoo (SMT) Information*

ANSI/IEEE Std 754-1985, IEEE *Standard for Binary Floating-Point Arithmetic*

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1
biometric data
biometric sample at any stage of processing, biometric reference, biometric feature or biometric property

NOTE For the purpose of this document, biometric data refers to finger pattern spectral data, quality data, and other data derived from an acquired biometric sample.