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Information technology — Extensible biometric data interchange formats —

Part 2: Finger minutiae data

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Foreword

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A list of all parts in the ISO/IEC 39794 series can be found on the ISO and IEC websites.

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Introduction

Biometric data interchange formats enable the interoperability of different biometric systems. The first generation of biometric data interchange formats was published between 2005 and 2007 in the first edition of the ISO/IEC 19794 series. From 2011 onwards, the second generation of biometric data interchange formats was published in the form of second editions of the established parts and the first editions of a number of new parts of the ISO/IEC 19794 series. In the second generation of biometric data interchange formats, new useful data elements such as data elements related to biometric sample quality were added, the header data structures were harmonized across all parts of the ISO/IEC 19794 series, and XML encoding was added in addition to the binary encoding.

In anticipation of the future need for additional data elements and to avoid future compatibility issues, ISO/IEC JTC 1/SC 37 has developed the ISO/IEC 39794 series as a third generation of biometric data interchange formats, defining extensible biometric data interchange formats capable of including future extensions in a defined manner. Extensible specifications in ASN.1 (Abstract Syntax Notation One) and the distinguished encoding rules of ASN.1 form the basis for encoding biometric data in binary tag-length-value formats. XML Schema Definitions form the basis for encoding biometric data in XML (eXtensible Markup Language).

This third generation of finger minutia data interchange formats complements ISO/IEC 19794-2:2005 and ISO/IEC 19794-2:2011. The first generation of biometric data interchange formats, which has been adopted in mass deployments, will be retained in the standards catalogue as long as required.

This document is intended for those applications requiring the exchange of fingerprint minutiae data. It will provide implementers with the flexibility to accommodate minutiae captured from dissimilar devices, varying image sizes, spatial sampling rates and different grey-scale depths. Use of the finger minutiae will allow each vendor to implement their own algorithms to determine whether two fingerprint records are from the same finger.

This document supports both binary and XML encoding, to support a spectrum of user requirements. With XML, this document meets the requirements of modern IT architectures. With binary encoding, this document is also able to be used in bandwidth- or storage-constrained environments.

For use on integrated circuit cards and other tokens (see ISO/IEC 7816-11 and ISO/IEC 24787-1:—[1)]), this document also specifies an on-card biometric comparison format and on-card comparison parameters based on extensible tag-length-value (TLV) encoding. ISO/IEC 24787-1 specifies the encapsulation of biometric data in on-card biometric comparison format into TLV-structured verification data for on-card biometric comparison.

This document defines specifics of the extraction of key points (called minutiae) from fingerprint ridge patterns. These specifics include a description of the types of minutiae identified, the method used for the placement of minutiae on an image, a definition of the coordinate system used, and the methods used to calculate the angle associated with each minutia.

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Information technology — Extensible biometric data interchange formats —

Part 2: Finger minutiae data

1 Scope

This document specifies:

— generic extensible data interchange formats for the representation of finger minutia data:

  — a tagged binary data format based on an extensible specification in ASN.1,

  — a textual data format based on an XML schema definition that is capable of holding the same information as the tagged binary format, and

  — an on-card biometric comparison format based on extensible TLV encoding;

— on-card biometric comparison parameters based on extensible TLV encoding for constructing valid probe data in the on-card biometric comparison format;

— examples of data record contents;

— application-specific requirements, recommendations and best practices in determining minutiae location, direction and type; and

— conformance test assertions and conformance test procedures applicable to this document.

NOTE Whereas ISO/IEC 39794-4 covers finger, palm, toe and foot image data, this document covers only finger minutiae and is not applicable to palms, toes or feet.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 39794-1, *Information technology — Extensible biometric data interchange formats — Part 1: Framework*

ISO/IEC 8825-1, *Information technology — ASN.1 encoding rules — Part 1: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*

ISO/IEC 19785-3, *Information technology — Common Biometric Exchange Formats Framework — Part 3: Patron format specifications*

ISO/IEC 2382-37, *Information technology — Vocabulary — Part 37: Biometrics*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 2382-37, ISO/IEC 39794-1 and the following apply.

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