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Information technology — Biometric data interchange formats —

Part 6: Iris image data

AMENDMENT 1: Conformance testing methodology and clarification of defects

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

Partie 6: Données d'image de l'iris

AMENDEMENT 1: Méthodologie d'essai de conformité et clarification des défauts

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Foreword

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Amendment 1 to ISO/IEC 19794-6:2011 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information Technology*, Subcommittee SC 37, *Biometrics*.

Information Technology — Biometric data interchange formats — Part 6: Iris image format

Amendment 1: Conformance testing methodologies and clarification of defects

1. The following text is to be added to the "Introduction" clause of ISO/IEC 19794-6:

Annex A of this International Standard is distinct from the ISO/IEC 29109-6 which addressed conformance testing only of the first, 2005, edition of the ISO/IEC 19794-6. The normative Annex A of this International Standard addresses conformance testing of data formats specified in this International Standard (i.e. second edition of 19794-6).

2. The following text is to be added to the "Scope" clause of ISO/IEC 19794-6:

This part of ISO/IEC 19794 also specifies elements of conformance testing methodology, test assertions, and test procedures as applicable to this part of ISO/IEC 19794. It establishes test assertions pertaining to the structure of the iris image data format as specified in Clause 6, 7 and 8 of this part of ISO/IEC 19794 (Type A Level 1 as defined in ISO/IEC 19794-1/Amd 1:2013), test assertions pertaining to internal consistency by checking the types of values that may be contained within each field (Type A Level 2 as defined in ISO/IEC 19794-1/Amd 1:2013), and semantic test assertions (Type A Level 3 as defined in ISO/IEC 19794-1/Amd 1:2013.

The conformance testing methodology specified in this part of ISO/IEC 19794 does not establish

— tests of other characteristics of biometric products or other types of testing of biometric products (e.g. acceptance, performance, robustness, security),

— tests of conformance of systems that do not produce data records conforming to the requirements of this part of ISO/IEC 19794.

3. The following text is to be added to the "Conformance" clause of ISO/IEC 19794-6:

Biometric data interchange format conformance tests conform to this part of ISO/IEC 19794 if they satisfy all of the normative requirements set forth in clause 8. Specifically, they shall use the test methodology specified in Clauses A.1, A.2 and A.3 of ISO/IEC 19794-1/Amd 1:2013, and all Level 1, Level 2 and Level 3 tests shall use the assertions defined in Table A.2 of Clause A.3 of this part of ISO/IEC 19794 in conformity with the concept and rules set in 19794-1 Annex A1.

Implementations of this part of ISO/IEC 19794 tested according to the specified methodology shall be able to claim conformance only to those biometric data record (BDR) requirements specified in this part of ISO/IEC 19794 that are tested by the test methods established by this methodology.

Implementations of this part of ISO/IEC 19794 do not necessarily need to conform to all possible aspects of this part of ISO/IEC 19794, but only to those requirements that are claimed to be supported by the implementation in an implementation conformance statement (ICS), filled out in accordance with Clause A.3 of ISO/IEC 19794-1/Amd 1:2013 and tables of Clause A.3 of this part of ISO/IEC 19794.

4. The following referenced document is to be added to clause "Normative References" of ISO/IEC 19794-6:

— ISO/IEC 19794-1:2011 – Information Technology – Biometric data interchange formats – Part 1: Framework. Amendment 1: Generalized Conformance Testing Methodology

5. In clause 6.1 of ISO/IEC 19794-6:2011, Table 1, delete title "compression", replace "Mode" with "Compression mode", replace "method" with "Data encoding method", and replace all appearances of "n/a" with "RAW"

6. In clause 6.5.1 of ISO/IEC 19794-6:2011, remove 2nd sentence: "At least one region shall be masked."

7. In clause 6.5.1 of ISO/IEC 19794-6:2011, add to the end of the 1st paragraph the following text:

In the Cropped and Masked Iris Image type, the image regions outside of the iris itself shall be masked with uniform pixel values in order to increase compressibility and to ensure that coding bytes are allocated maximally to the iris texture itself.

Pixels in the sclera shall be replaced uniformly with the value 200.

Furthermore, when upper and/or lower eyelids are detected within the cropped image, then pixels in these eyelid regions and beyond shall be replaced with the value 128 such that normal methods for detecting and fitting such eyelid boundaries in unmasked images may continue to function with the Cropped and Masked Iris Image type. Note that none, one or both of the upper or lower eyelids may occlude the iris (see Figure 3). In all these cases, the pixels in the sclera shall be replaced uniformly with the value 200, and if eyelid regions are detected, pixels in those regions and beyond shall be replaced with the value 128.

8. In clause 6.5.2 of ISO/IEC 19794-6:2011, change "The sclera mask shall extend to the first and last columns unless the upper and lower eyelids touch there." with "The sclera mask shall extend to the first and last columns unless the extremes of the upper and lower eyelids meet inside the left or right image boundary."

9. In clause 6.5.3 of ISO/IEC 19794-6:2011, change Figure 3 with the following one:

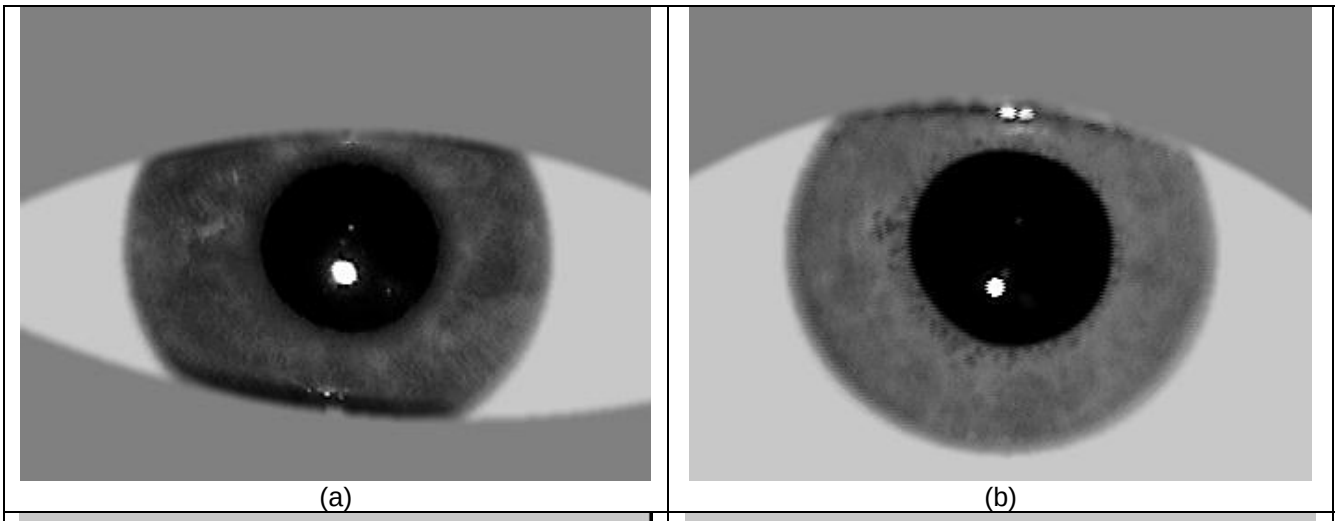

Figure 3 - Examples of Cropped and Masked iris images. (a) Iris occluded by both eyelids. (b) Iris occluded by the upper eyelid and not the lower eyelid. (c) Iris occluded by the lower eyelid and not the upper eyelid. (d) Iris is not occluded by eyelids

10. Replace Annex A of ISO/IEC 19794-6:2011 with the following one:

Annex A
(normative)

Conformance Testing Methodology

A.1 Introduction

The testing methodology specified in ISO/IEC 19794-1:2011 AMD 1 shall apply. The content of the tables below is based on the conformance testing methodology outlined in ISO/IEC 19794-1:2013 AMD 1 and shall only be used in the context of that testing methodology.

A.2 Table of requirements

The normative requirements of ISO/IEC 19794-6:2011 Biometric Data Interchange Formats – Part 6 - iris Image Data are listed in Table A.1 (Table A.1 extends over multiple pages). The supplier of the IUT shall explain which optional components of the standard are supported and the testing laboratory shall note the results of the test.

NOTE TO ISO EDITOR: it is required to repeat the title of all tables in this document wherever the table extends over multiple pages.

Table A.1 — Table of requirements for data formats

Requirement ID	Reference in Data Format	Requirement Summary	Level	Status	Applicable to format type				IUT Support	Supported Range	Test Result
					Type 01	Type 02	Type 03	Type 07			
R-1.	Table3 row 1	The format identifier shall be recorded in four bytes.	1	M	Y	Y	Y	Y			
R-2.	Table3 row 1	The format identifier shall consist of three characters "IIR", standing for iris image record, followed by a zero byte as a NULL string terminator.	1	M	Y	Y	Y	Y			
R-3.	Table3 row 2	The number for the version of that part of ISO/IEC 19794 used for constructing the iris image data record shall be placed in four bytes.	1	M	Y	Y	Y	Y			
R-4.	Table3 row 2	This version number shall consist of three ASCII numerals followed by a zero byte as a NULL string terminator. The first and second character will represent the major version number ('0','2') and the third character will represent the minor revision number ('0').	1	M	Y	Y	Y	Y			
R-5.	Table3 row 3	The length (in bytes) of the entire iris image data record shall be recorded in four bytes.	1	M	Y	Y	Y	Y			
R-6.	Table 3 row 3	The length of record shall be a value between 69 and (2^{32}-1)	1	M	Y	Y	Y	Y			
R-7.	Table3 row 3	This count shall be the total length of the data block including the iris record header and one or more representation records.	2	M	Y	Y	Y	Y			
R-8.	Table3 row 4	The total number of iris representations in the record shall be recorded in two bytes.	1	M	Y	Y	Y	Y			
R-9.	Table 3 row 4	The total number of iris representations in the record shall be a number between 1 and 65535	1	M	Y	Y	Y	Y			
R-10.	Table3 row 4	A minimum of one representation is required.	2	M	Y	Y	Y	Y			

R-11.	Table 3 row 4	The number of iris representations shall be equal to the number of representations present in the record	2	M	Y	Y	Y	Y			
R-12.	Table 3 row 5	The certification flag shall be composed of one single byte	1	M	Y	Y	Y	Y			
R-13.	Table 3 row 5	The certification flag shall be a 00_{Hex} value, as no certification blocks are expected	1	M	Y	Y	Y	Y			
R-14.	Table 3 row 5	There shall not be a certification data block within the register.	2	M	Y	Y	Y	Y			
R-15.	Table 3 row 6	The number of eyes represented shall be recorded in one byte	1	M	Y	Y	Y	Y			
R-16.	Table 3 row 6	The number of eyes represented shall be a number between 0 and 2	1	M	Y	Y	Y	Y			
R-17.	Table 3 row 6	The number of eyes represented shall be 1 if the eye label for all representations has the same value, being either 1 or 2	2	M	Y	Y	Y	Y			
R-18.	Table 3 row 6	The number of eyes represented shall be 2 if the eye label for all representations has a value of 1 or 2, and within all representations are one or some of them with the value of 1 and the rest with the value of 2	2	M	Y	Y	Y	Y			
R-19.	Table 3 row 6	The number of eyes represented shall be 0 if the eye label of any of the representations is declared to be undefined (i.e. its value is 0)	2	M	Y	Y	Y	Y			
R-20.	7.1	All data shall be stored in network byte (big-endian) order.	1	M	Y	Y	Y	Y			
R-21.	7.1	Where bit-level data definitions are specified, bit 1 shall be interpreted as the least significant bit	1	C	Y	Y	Y	Y			
R-22.	7.2	The record shall contain images from a single individual	3C	O1	Y	Y	Y	Y			
R-23.	7.2	The iris image biometric data record shall have an iris general header and at least the information about one image.	1	M	Y	Y	Y	Y			
R-24.	7.2	The record shall contain images from one or two eyes.	3C	O1	Y	Y	Y	Y			
R-25.	7.3	The iris image biometric data record shall have an iris record header that contains information about the number of images that follow, the number of eyes represented and the total length, plus other information stated in Table 3.	2	M	Y	Y	Y	Y			

R-100.	7.2	A Representation Header shall precede each representation providing information for that representation. There shall be one header for each representation contained in the BDIR.	1	M	Y	Y	Y	Y			
R-101.	Table 4 row 1	For each image representation, the representation length shall be coded as an integer value in 4 bytes	1	M	Y	Y	Y	Y			
R-102.	Table 4 row 1	Any representation length shall have a value between 53 and $((2^{32}-1)-16)$	1	M	Y	Y	Y	Y			
R-103.	Table 4 row 1	For each image representation, the representation length shall be the number of bytes between the end of the previous representation (or the general header for the first representation in the record), and the beginning of the next representation (or the end of the record for the last representation in the record)	2	M	Y	Y	Y	Y			
R-104.	Table 4 row 2	The capture date field shall be encoded in nine bytes	1	M	Y	Y	Y	Y			
R-105.	Table 4 row 2	The coding of the capture date field shall be in the format defined in ISO/IEC 19794-1	1	M	Y	Y	Y	Y			
R-106.	Table 4 row 2	The Gregorian calendar year of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	Y	Y	Y			
R-107.	Table 4 row 2	The month of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	Y	Y	Y			
R-108.	Table 4 row 2	The day of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	Y	Y	Y			
R-109.	Table 4 row 2	The hour of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	Y	Y	Y			
R-110.	Table 4 row 2	The minute of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	Y	Y	Y			
R-111.	Table 4 row 2	The second of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	Y	Y	Y			
R-112.	Table 4 row 2	The millisecond of the capture date and time field shall be encoded in the form given in ISO/IEC 19794-1.	1	M	Y	Y	Y	Y			

R-113.	Table 4 row 2	The capture date and time field shall indicate when the capture of this representation started in Coordinated Universal Time (UTC).	3C	O1	Y	Y	Y	Y			
R-114.	Table 4 row 3	The capture device technology identifier shall be coded in one single byte	1	M	Y	Y	Y	Y			
R-115.	Table 4 row 3	The capture device technology identifier shall have a value of 0 or 1	1	M	Y	Y	Y	Y			
R-116.	Table 4 row 3	The capture device technology identifier shall have a value of 00_{Hex} when the capture device technology is unknown or unspecified.	3C	O1	Y	Y	Y	Y			
R-117.	Table 4 row 3	The capture device technology ID shall indicate the class of capture device technology used to acquire the captured biometric sample.	3C	O1	Y	Y	Y	Y			
R-118.	Table 4 row 4	The capture device vendor ID shall be coded in 2 bytes	1	M	Y	Y	Y	Y			
R-119.	Table 4 row 4	The capture device vendor ID shall be registered with the IBIA or other approved registration authority.	2	M	Y	Y	Y	Y			
R-120.	Table 4 row 4	A value of all zeros for capture device vendor ID shall indicate that the capture device vendor is unreported.	1	M	Y	Y	Y	Y			
R-121.	Table 4 row 4	The capture device vendor ID shall identify the biometric organization that owns the product that created the record.	3C	O1	Y	Y	Y	Y			
R-122.	Table 4 row 5	The capture device type ID field shall be coded in 2 bytes	1	M	Y	Y	Y	Y			
R-123.	Table 4 row 5	The capture device type ID shall be registered with the IBIA or other approved registration authority.	1	M	Y	Y	Y	Y			
R-124.	Table 4 row 5	A value of all zeros for capture device type ID shall indicate that the capture device type is unreported.	1	M	Y	Y	Y	Y			
R-125.	Table 4 row 5	The capture device type ID shall identify the product type that created the record	3C	O1	Y	Y	Y	Y			
R-126.	Table 4 row 6	If no quality information is present, the quality block shall be coded in one byte	1	M	Y	Y	Y	Y			

R-127.	Table 4 row 6	If no quality information is present, the length field in the quality block shall be 0	1	M	Y	Y	Y	Y			
R-128.	Table 4 row 6	If there is quality information within the representation, the quality block shall be coded as m bytes where m = (5*N+1) bytes, and N is the number of quality scores reported	1	M	Y	Y	Y	Y			
R-129.	Table 4 row 6	If there are N quality scores reported in the quality information block, then the quality length field shall be equal to N	2	M	Y	Y	Y	Y			
R-130.	Table 4 row 6	The quality block shall consist of a length field followed by zero or more quality sub-blocks.	1	M	Y	Y	Y	Y			
R-131.	Table 4 row 6	In the quality block, the length field shall consist of one byte coded as an unsigned integer	1	M	Y	Y	Y	Y			
R-132.	Table 4 row 6	The length field in the quality block shall represent the number of quality sub-blocks.	2	M	Y	Y	Y	Y			
R-133.	Table 4 row 6	If the number of quality blocks field is 0 then the Representation number field follows immediately after the number of quality blocks field.	2	M	Y	Y	Y	Y			
R-134.	Table 4 row 6	Each quality sub-block shall consist of a quality score, a quality algorithm vendor identifier, and a quality algorithm identifier	1	C	Y	Y	Y	Y			
R-135.	Table 4 row 6	Each “Quality score” shall be encoded in one byte as an unsigned integer.	1	C	Y	Y	Y	Y			
R-136.	Table 4 row 6	The quality score shall be recorded as a number between 0 and 100, if quality has been computed, or a 255 if the quality calculation has failed.	1	C	Y	Y	Y	Y			
R-137.	7.4	The quality algorithm vendor ID shall be encoded in two bytes.	1	C	Y	Y	Y	Y			
R-138.	7.4	A value of all zeros in the quality algorithm vendor ID shall be used if the quality algorithm vendor is unreported.	1	M	Y	Y	Y	Y			
R-139.	7.4	The quality algorithm vendor ID shall be registered by IBIA or other approved registration authority.	2	C	Y	Y	Y	Y			
R-140.	7.4	The quality algorithm ID shall be encoded in two bytes.	1	C	Y	Y	Y	Y			
R-141.	7.4	A value of all zeros in the quality algorithm ID shall be used if the quality algorithm is unreported	1	M	Y	Y	Y	Y			
R-142.	7.4	The quality algorithm ID shall be registered by IBIA or other	3C	O1	Y	Y	Y	Y			