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Part 1: Framework

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Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Abbreviated terms ... **4**
5 Conformance ... **4**
6 Biometric sample quality criteria ... **4**
6.1 Reference model ... 4
6.2 Quality aspects: character, fidelity, utility ... 5
6.3 Use cases of data quality measures ... 6
6.3.1 General ... 6
6.3.2 Real-time quality assessment ... 6
6.3.3 Use in different applications ... 6
6.3.4 Use as a survey statistic ... 7
6.3.5 Accumulation of relevant statistics ... 7
6.3.6 Sample-based reference database improvement ... 7
6.3.7 Quality-based conditional processing ... 8
6.3.8 Quality-directed fusion ... 8
6.3.9 Interchange of quality measures by disparate systems ... 8
6.3.10 Workload reduction with quality scores ... 8
6.3.11 Selection of the best of a series of biometric samples ... 8
7 Data interchange format field definition ... **8**
7.1 Abstract description ... 8
7.1.1 Overview ... 8
7.1.2 Quality assessment algorithm identifier block ... 9
7.1.3 Quality measure (quality score or quality component) or error ... 9
7.2 XML encoding ... 11
7.3 Tagged binary encoding ... 11
8 Exchange of quality assessment algorithm results ... **12**
9 Quality score normalization ... **12**
10 Pairwise quality ... **13**
11 Evaluation ... **14**
11.1 General ... 14
11.2 False non-match error versus discard method ... 14
11.3 False match error versus discard method ... 15
11.4 DET versus discard method ... 16
11.5 Sample acceptance or discard rate ... 17
Annex A (informative) **Example of encoding a biometric sample quality block** ... **18**
Annex B (informative) **Example of standardized exchange of quality assessment algorithm results** ... **19**
Annex C (informative) **Procedures for aggregation of utility-based quality scores for sample-based systems** ... **21**
Annex D (informative) **Example code for computing utility-prediction performance metrics** ... **24**
Bibliography ... **26**

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 37, *Biometrics*.

This third edition cancels and replaces the second edition (ISO/IEC 29794-1:2016), which has been technically revised.

The main changes are as follows:

— the definitions of “quality”, “quality score”, and “utility” have been aligned with those in ISO/IEC 2382-37:2022;

— methods for evaluating the efficacy of quality assessment algorithms have been added;

— ASN.1 encoding as defined in ISO/IEC 39794-1 is supported.

A list of all parts in the ISO/IEC 29794 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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Introduction

Quality measures are useful for several applications in the field of biometrics. While ISO/IEC 19784-1 specifies a structure and gives guidelines for quality score categorization, this document defines and specifies methodologies for objective and quantitative quality score expression, interpretation and interchange.

This document establishes a framework that facilitates the use of biometric sample quality assessment and scoring tools. The tools are intended to encourage innovation and performance improvements in, and interoperability of, biometric systems generally. The ISO/IEC 29794 series presents several biometric sample quality assessment and scoring tools, the use of which is generally optional but can be determined as mandatory by particular application profiles or specific implementations. The ISO/IEC 29794 series is prepared to accommodate additional parts that address the biometric modes specified by the ISO/IEC 19794 series and the ISO/IEC 39794 series, with part numbers and titles aligning appropriately. However, as this document is intended for use by all biometric modes, a mode does not necessarily need a mode-specific part to make use of quality scores.

Several applications can benefit from the use of biometric sample quality measures. An example is the use of real-time quality feedback as part of the biometric capture process to improve the operational efficiency and performance of a biometric system. Other examples include data fusion for which multiple samples or references are available in the comparison process, either from a single or multiple biometric mode, and hardening systems against presentation attacks using or targeting low quality biometric samples. The association of quality measures with biometric samples is an important component of quality measure standardization. Quality fields as specified in Clause 7 are included in biometric data interchange formats. If a CBEFF (Common Biometric Exchange Formats Framework) header is present, then CBEFF_BDB_quality may additionally be used to express quality measures. Useful analyses can be performed using quality measures along with other data to improve the performance of a biometric system. For example, correlating quality measures to other system metrics can be used to diagnose problems and highlight potential areas of performance improvement.

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Information technology — Biometric sample quality —

Part 1: Framework

1 Scope

This document establishes the following items for any or all biometric sample types as necessary:

— terms and definitions that are useful in the specification and use of quality measures;

— purpose and interpretation of biometric quality scores;

— motivation for developing biometric sample datasets for the purpose of quality score normalization;

— format for exchange of quality assessment algorithm results;

— methods for aggregation of quality scores;

— methods for evaluating the efficiency of quality assessment algorithms.

The following are outside the scope of this document:

— specification of minimum requirements for sample, module, or system quality scores;

— standardization of quality assessment algorithms;

— assessment of utility of biometric samples or references for human examiners.

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

ISO/IEC 19785-2, *Information technology — Common Biometric Exchange Formats Framework — Part 2: Biometric registration authority*

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.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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