INTERNATIONAL STANDARD

ISO/IEC 19989-2

First edition
2020-10

Information security — Criteria and methodology for security evaluation of biometric systems —

Part 2: Biometric recognition performance

Sécurité de l'information — Critères et méthodologie pour l'évaluation de la sécurité des systèmes biométriques —

Partie 2: Efficacité de reconnaissance biométrique

Reference number
ISO/IEC 19989-2:2020(E)

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

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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.

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).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 27, *Information security, cybersecurity and privacy protection*.

A list of all parts in the ISO/IEC 19989 series can be found on the ISO website.

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.

Introduction

Biometric systems can be subject to presentation attacks where attackers attempt to subvert the system security policy by presenting their natural biometric characteristics or artefacts holding copied or faked characteristics. Presentation attacks can occur during enrolment or identification/verification events. Techniques designed to detect presentation artefacts are generally different from those to counter attacks where natural characteristics are used. Defence against presentation attacks with natural characteristics typically relies on the ability of a biometric system to discriminate between genuine enrolees and attackers based on the differences between their natural biometric characteristics. This ability is characterized by the biometric recognition performance of the system – how well or badly a biometric recognition system executes its required functions. Biometric recognition performance and presentation attack detection have a bearing on the security of biometric systems. Hence, the evaluation of these aspects of performance from a security viewpoint will become important considerations for the procurement of biometric products and systems.

Biometric products and systems share many of the properties of other IT products and systems which are amenable to security evaluation using the ISO/IEC 15408 series and ISO/IEC 18045 in the standard way. However, biometric systems embody certain functionality that needs specialized evaluation criteria and methodology which is not addressed by the ISO/IEC 15408 series and ISO/IEC 18045. Mainly, these relate to the evaluation of biometric recognition and presentation attack detection. These are the functions addressed in ISO/IEC 19989 (all parts).

ISO/IEC 19792 describes these biometric-specific aspects and specifies principles to be considered during the security evaluation of biometric systems. However, it does not specify the concrete criteria and methodology that are needed for security evaluation based on the ISO/IEC 15408 series.

The ISO/IEC 19989 series provides a bridge between the evaluation principles for biometric products and systems defined in ISO/IEC 19792 and the criteria and methodology requirements for security evaluation based on the ISO/IEC 15408 series. The ISO/IEC 19989 series supplements the ISO/IEC 15408 series and ISO/IEC 18045 by providing extended security functional requirements together with assurance activities related to these requirements. The extensions to the requirements and assurance activities found in the ISO/IEC 15408 series and ISO/IEC 18045 relate to the evaluation of biometric recognition and presentation attack detection which are particular to biometric systems.

ISO/IEC 19989-1 consists of the introduction of the general framework for the security evaluation of biometric systems, including extended security functional components, and supplementary methodology, which is additional evaluation activities for the evaluator. The detailed recommendations are developed for biometric recognition performance aspects in this document and for presentation attack detection aspects in ISO/IEC 19989-3.

This document describes supplements to the evaluation methodology for biometric recognition performance evaluation for the security evaluation of biometric products. It supplements the ISO/IEC 15408 series, ISO/IEC 18045 and ISO/IEC 19989-1. It builds on the general considerations described in ISO/IEC 19792 and the biometric performance testing methodology described in ISO/IEC 19795-1 by providing additional guidance to an evaluator.

In this document the term “data subject” is used while "user" is used in ISO/IEC 19989-1, in order to be consistent with biometric vocabulary, as biometric experts are supposed to be the main readers of this document.

Information security — Criteria and methodology for security evaluation of biometric systems —

Part 2: Biometric recognition performance

1 Scope

For security evaluation of biometric verification systems and biometric identification systems, this document is dedicated to the security evaluation of biometric recognition performance applying the ISO/IEC 15408 series.

It provides requirements and recommendations to the developer and the evaluator for the supplementary activities on biometric recognition performance specified in ISO/IEC 19989-1.

The evaluation of presentation attack detection techniques is out of the scope of this document except for presentation from impostor attempts under the policy of the intended use following the TOE guidance documentation.

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 2382:2015, *Information technology — Vocabulary*

ISO/IEC 2382-37:2017, *Information technology — Vocabulary — Part 37: Biometrics*

ISO/IEC 15408-1:2009, *Information technology — Security techniques — Evaluation criteria for IT security — Part 1: Introduction and general model*

ISO/IEC 15408-3:2008, *Information technology — Security techniques — Evaluation criteria for IT security — Part 3: Security assurance components*

ISO/IEC 18045:2008, *Information technology — Security techniques — Methodology for IT security evaluation*

ISO/IEC 19792:2009, *Information technology — Security techniques — Security evaluation of biometrics*

ISO/IEC 19795-1:2006, *Information technology —Biometric performance testing and reporting —Part 1: Principles and framework*

ISO/IEC 19795-2:2007, *Information technology — Biometric performance testing and reporting — Part 2: Testing methodologies for technology and scenario evaluation*

ISO/IEC 19989-1:2020, *Information security — Criteria and methodology for security evaluation of biometric systems — Part 1: Framework*

ISO/IEC 30107-3:2017, *Information technology — Biometric presentation attack detection — Part 3: Testing and reporting*