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

Part 3: Presentation attack detection

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

Partie 3: Détection d'attaque de présentation

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 ISO documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 vulnerable 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 detect 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. 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 regular 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 this document.

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.

This document provides guidance and requirements to the developer and the evaluator for the supplementary activities on presentation attack detection specified in ISO/IEC 19989-1. It builds on the general considerations described in ISO/IEC 19792 and the presentation attack detection testing methodology described in ISO/IEC 30107-3 by providing additional guidance to the evaluator.

In this document, the term "user" is used to mean the term "capture subject" used in biometrics.

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Part 3: Presentation attack detection

1 Scope

For security evaluation of biometric verification systems and biometric identification systems, this document is dedicated to security evaluation of presentation attack detection applying the ISO/IEC 15408 series. It provides recommendations and requirements to the developer and the evaluator for the supplementary activities on presentation attack detection specified in ISO/IEC 19989-1.

This document is applicable only to TOEs for single biometric characteristic type but for the selection of a characteristic from multiple characteristics.

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 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 19989-1:2020, *Information Technology — Security techniques — 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*