AS ISO/IEC 39794.17:2024
ISO/IEC 39794-17:2021

Australian STANDARD®

STANDARDS Australia

Information technology — Extensible biometric data interchange formats

Part 17: Gait image sequence data

AS ISO/IEC 39794.17:2024

This Australian Standard® was prepared by IT-032, Biometrics and Identification. It was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 20 November 2024.

This Standard was published on 6 December 2024.

The following are represented on Committee IT-032:

Department of Defence (Australian Government)
Department of Foreign Affairs and Trade (DFAT)
Department of Home Affairs — Digital and Technology Policy Division
Photo Marketing Association
SITA

This Standard was issued in draft form for comment as DR AS ISO/IEC 39794.17:2024.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:
www.standards.org.au

ISBN 978 1 76139 951 0

Information technology — Extensible biometric data interchange formats

Part 17: Gait image sequence data

First published as AS ISO/IEC 39794.17:2024.

Preface

This Standard was prepared by the Standards Australia Committee IT-032, Biometrics and Identification.

The objective of this document is to specify examples of application-specific requirements, recommendations and best practices in data acquisition applicable to gait image sequence data. Its typical applications include —

(a) support for human examination of high-resolution video and still images;

(b) support for human biometric verification and identification based on video and still images; and

(c) automated gait image sequence verification and identification.

This document ensures that image sequences are suitable for human identification and human verification generated by video surveillance and other similar systems.

This document is identical with, and has been reproduced from, ISO/IEC 39794-17:2024, *Information technology — Extensible biometric data interchange formats — Part 17: Gait image sequence data.*

As this document has been reproduced from an international document, a full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

Contents

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 or www.iec.ch/members_experts/refdocs).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC 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) or the IEC list of patent declarations received (see patents.iec.ch).

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. In the IEC, see www.iec.ch/understanding-standards.

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

A list of all parts in the ISO/IEC 39794 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 and www.iec.ch/national-committees.

The purchase of this ISO/IEC document carries a copyright licence for the purchaser to use ISO/IEC copyright in the schemas in the annexes to this document for the purpose of developing, implementing, installing and using software based on those schemas, subject to ISO/IEC licensing conditions set out in the schemas.

Introduction

Most countries around the world use biometric recognition systems for law enforcement and border control. Many of these systems are not limited to face recognition purposes. To be consistent in such deployments and processes, technical documents, guidelines and best practice recommendations are being developed by different groups. However, these documents are primarily focused on travel documents and related border control systems and the technical and operational issues to be considered when planning and deploying them. Gait recognition is the biometric mode used as a secondary mode in addition to biometric full body recognition or for forensic purposes. Face recognition is the biometric mode best suited to the practicalities of travel documents and automated border processing.

There is little guidance covering the gait imaging for cross-border interoperability or law enforcement services. There is a need for guidance for the use of high-quality digital cameras and video surveillance devices to record gait image sequence data. This document is not restricted to full body gait image sequence data. For example, it can be possible to extract only head movement data for recognition. Gait recognition in this document therefore also covers recognition based on different body parts, e.g. head or limb.

To enable applications on a wide variety of devices, including devices that have limited data storage, and to improve biometric recognition accuracy, this document addresses not only data format, but also scene constraints (lighting, pose, expression, etc.), photographic properties (positioning, camera focus, etc.), and digital image attributes (image resolution, image size, etc.).

A specific biometric profile for cross-border interoperability is required for gait video and still images. Gait image sequence data standardization is required to achieve the threshold quality gait image database records required for automated gait biometric verification and identification. At the moment, border guards record gait video using local practices for gait biometric enrolment, verification and identification.

In order to fully understand the requirements implied in this document it is recommended that the user become acquainted with the following documents: ISO/IEC 39794-16, specifying full body image file formats; ISO 22311, giving information on a common output file format that can be extracted from the video-surveillance contents collection systems to perform necessary processing; the ISO/IEC 30137 series, giving information on the use of biometrics in video surveillance systems; and EN 62676[7] defining video surveillance systems for use in security applications.

This document is intended to provide advice on the use of body image data for gait and upper body movement recognition applications requiring exchange of gait image sequence data and upper body movement data. Typical applications are:

— automated body biometric verification and identification (one-to-one as well as one-to-many comparison),

— support for human biometric verification by comparison of persons based on video and still gait images, and

— support for human examination of video and still gait images with sufficient resolution to allow a human examiner to perform biometric verification.

The structure of the data format is compatible with ISO/IEC 39794-5 and ISO/IEC 39794-16.

This document specifies application-specific profiles including scene constraints, imaging properties and digital image attributes, like image spatial and temporal sampling rates, image size, etc. These modality and application profile specifics are contained in Figures 6 and 7 respectively. Data creation and exchange is described in ISO/IEC 39794-16. The body image data blocks used in encoding gait image sequence data are of type *BodyImageDataBlockType*, which is defined in ISO/IEC 39794-16. This document makes normative reference to other ISO/IEC International Standards.

Australian Standard®

Information technology — Extensible biometric data interchange formats

Part 17: Gait image sequence data

1 Scope

This document specifies examples of application-specific requirements, recommendations and best practices in data acquisition applicable to gait image sequence data. Its typical applications include

a) support for human examination of high-resolution video and still images;

b) support for human biometric verification and identification based on video and still images;

c) automated gait image sequence verification and identification.

This document ensures that image sequences are suitable for human identification and human verification generated by video surveillance and other similar systems.

The following topics are not in scope of this document:

— Definitions for facial and/or full body image related biometric profiles, which are fully covered in ISO/IEC 39794-5 and ISO/IEC 39794-16 respectively.

— Security aspects like digital image sequence electronic signature, Presentation Attack Detection (PAD) and morphing prevention.

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 10918-1, *Information technology — Digital compression and coding of continuous-tone still images: Requirements and guidelines*

ISO/IEC 10918-5, *Information technology — Digital compression and coding of continuous-tone still images: JPEG File Interchange Format (JFIF) — Part 5:*

ISO/IEC 14496-1, *Information technology — Coding of audio-visual objects — Part 1: Systems*

ISO/IEC 14496-2, *Information technology — Coding of audio-visual objects — Part 2: Visual*

ISO/IEC 15444-1, *Information technology — JPEG 2000 image coding system — Part 1: Core coding system*

ISO/IEC 15948, *Information technology — Computer graphics and image processing — Portable Network Graphics (PNG): Functional specification*

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

ISO/IEC 39794-1, *Information technology — Extensible biometric data interchange formats — Part 1: Framework*

ISO/IEC 39794-5, *Information technology — Extensible biometric data interchange formats — Part 5: Face image data*

ISO/IEC 39794-16, *Information technology — Extensible biometric data interchange formats – Part 16: Full body image data*

XML Schema Part 0: Primer Second Edition, W3C Recommendation, October 2004, https://www.w3.org/TR/xmlschema-0/