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AMENDMENT 1
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**Information technology — Extensible
biometric data interchange formats —**

Part 4:
Finger image data

AMENDMENT 1: Extension towards
improved interoperability with ANSI/
NIST-ITL

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[ISO/IEC 39794-4:2019/Amd 1:2023](https://standards.iteh.ai/catalog/standards/sist/a5ab8953-644b-443f-8a5d-3c27841e36b7/iso-iec-39794-4-2019-amd-1-2023)

<https://standards.iteh.ai/catalog/standards/sist/a5ab8953-644b-443f-8a5d-3c27841e36b7/iso-iec-39794-4-2019-amd-1-2023>



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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 and IEC websites.

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AMENDMENT 1: Extension towards improved interoperability with ANSI/NIST-ITL

7.3

Replace:

“The year shall be the year of the publication of this document.”

with:

“The year shall be the year of the publication of the standard or amendment or corrigendum that specifies the used version of the format.”

8.2

Add:

<https://standards.iteh.ai/catalog/standards/sist/a5ab8953-644b-443f-8a5d-3c27841e36b7/iso-iec-39794-4-2019-amd-1-2023>

“The encoding example in Clause B.2 is available at <https://standards.iso.org/iso-iec/39794/-4/ed-1/en>. The XSD in Clause A.4 extends the XSD in Clause A.2 by allowing the use of the same palm position codes and impression codes as ANSI/NIST ITL 1.^[3] The XSD in Clause A.4 and the encoding example in Clause B.3 are available at <https://standards.iso.org/iso-iec/39794/-4/ed-1/en/amd/1>.”

Annex A

Insert the following text as Clause A.3.

A.3 ANSI-NIST ITL Harmonized ASN.1 module for tagged binary encoding

```
ISO-IEC-39794-4-ed-1-v2 {iso(1) standard(0) iso-iec-39794(39794) part-4(4) ed-1(1) v2(2) iso-iec-39794-4(0)}
```

```
-- Permission is hereby granted, free of charge in perpetuity, to any person
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```

ISO/IEC 39794-4:2019/Amd. 1:2023(E)

-- USE OR OTHER DEALINGS IN THE ASN.1 MODULE.

DEFINITIONS IMPLICIT TAGS ::= BEGIN

IMPORTS

QualityBlocks,
ScoreOrError,
RegistryIdBlock,
CertificationIdBlocks,
CaptureDateTimeBlock,
PADDataBlock,
VersionBlock,
CoordinateCartesian2DUnsignedShortBlock,
ExtendedDataBlock

FROM ISO-IEC-39794-1-ed-1-v1;

PositionCode ::= ENUMERATED {

unknownPosition(0),
rightThumbFinger(1),
rightIndexFinger(2),
rightMiddleFinger(3),
rightRingFinger(4),
rightLittleFinger(5),
leftThumbFinger(6),
leftIndexFinger(7),
leftMiddleFinger(8),
leftRingFinger(9),
leftLittleFinger(10),
rightFourFingers(13),
leftFourFingers(14),
bothThumbFingers(15),
rightExtraDigitFinger(16),
leftExtraDigitFinger(17),
unknownFrictionRidge(18),
entireJointImage(19),
unknownPalm(20),
rightFullPalm(21),
rightWritersPalm(22),
rightLowerPalm(23),
rightUpperPalm(24),
rightOtherPalm(25),
rightInterdigital(26),
rightThenar(27),
rightHypothenar(28),
leftFullPalm(29),
leftWritersPalm(30),
leftLowerPalm(31),
leftUpperPalm(32),
leftOtherPalm(33),
leftInterdigital(34),
leftThenar(35),
leftHypothenar(36),
rightGrasp(37),
leftGrasp(38),
rightIndexMiddleFingers(40),
rightMiddleRingFingers(41),
rightRingLittleFingers(42),
leftIndexMiddleFingers(43),
leftMiddleRingFingers(44),
leftRingLittleFingers(45),
rightIndexLeftIndexFingers(46),
rightIndexMiddleRingFingers(47),
rightMiddleRingLittleFingers(48),
leftIndexMiddleRingFingers(49),
leftMiddleRingLittleFingers(50),
rightFourFingertips(51),
leftFourFingertips(52),
rightFingertips(53),
leftFingertips(54),
leftMiddleIndexRightIndexMiddleFingers(55),
unknownSole(60),

```

    rightSole(61),
    leftSole(62),
    unknownToe(63),
    rightBigToe(64),
    rightSecondToe(65),
    rightMiddleToe(66),
    rightFourthToe(67),
    rightLittleToe(68),
    leftBigToe(69),
    leftSecondToe(70),
    leftMiddleToe(71),
    leftFourthToe(72),
    leftLittleToe(73),
    rightFrontBallFoot(74),
    rightBackHeelFoot(75),
    leftFrontBallFoot(76),
    leftBackHeelFoot(77),
    rightMiddleFoot(78),
    leftMiddleFoot(79),
    rightCarpalDelta(81),
    leftCarpalDelta(82),
    rightFullWithWriterPalm(83),
    leftFullWithWriterPalm(84),
    rightBracelet(85),
    leftBracelet(86),
    otherPosition(999)
}

AnsiNistItlPalmPositionCode ::= ENUMERATED {
    leftFullPalm(23),
    leftWritersPalm(24),
    rightLowerPalm(25),
    rightUpperPalm(26),
    leftLowerPalm(27),
    leftUpperPalm(28),
    rightOtherPalm(29),
    leftOtherPalm(30),
    rightInterdigital(31),
    rightThenar(32),
    rightHypothenar(33)
}

PositionExtensionBlock ::= SEQUENCE {
    fallback [0] PositionCode,
    ...,
    [[2022: -- added in ISO/IEC 39794-4:2019/Amd.1:2022
        ansiNistItlPalmPositionCode [1] AnsiNistItlPalmPositionCode OPTIONAL
    ]]
}

Position ::= CHOICE {
    code [0] PositionCode,
    extensionBlock [1] PositionExtensionBlock
}

ImpressionCode ::= ENUMERATED {
    plainContact(0),
    rolledContact(1),
    latentImage(4),
    swipeContact(8),
    stationarySubjectContactlessPlain(24),
    stationarySubjectContactlessRolled(25),
    movingSubjectContactlessPlain(41),
    movingSubjectContactlessRolled(42),
    otherImpression(28),
    unknownImpression(29)
}

AnsiNistItlImpressionCode ::= ENUMERATED {
    movingSubjectContactlessRolled(41),
    movingSubjectContactlessPlain(42)
}

```

```
}  
  
ImpressionExtensionBlock ::= SEQUENCE {  
    fallback [0] ImpressionCode,  
    ...,  
    [[2022: -- added in ISO/IEC 39794-4:2019/Amd.1:2022  
        ansiNistItlImpressionCode [1] AnsiNistItlImpressionCode OPTIONAL  
    ]]  
}  
  
Impression ::= CHOICE {  
    code [0] ImpressionCode,  
    extensionBlock [1] ImpressionExtensionBlock  
}  
  
CaptureDeviceTechnologyIdCode ::= ENUMERATED {  
    unknownCaptureDeviceTechnology(0),  
    otherCaptureDeviceTechnology(1),  
    scannedInkOnPaper(2),  
    opticalTIRBrightField(3),  
    opticalTIRDarkField(4),  
    opticalImage(5),  
    opticalLowFrequency3DMapped(6),  
    opticalHighFrequency3DMapped(7),  
    capacitive(9),  
    capacitiveRF(10),  
    electroLuminescence(11),  
    reflectedUltrasonic(12),  
    impediographicUltrasonic(13),  
    thermal(14),  
    directPressure(15),  
    indirectPressure(16),  
    liveTape(17),  
    latentImpression(18),  
    latentPhoto(19),  
    latentMolded(20),  
    latentTracing(21),  
    latentLift(22)  
}  
  
CaptureDeviceTechnologyIdExtensionBlock ::= SEQUENCE {  
    fallback [0] CaptureDeviceTechnologyIdCode,  
    ...  
}  
  
CaptureDeviceTechnologyId ::= CHOICE {  
    code [0] CaptureDeviceTechnologyIdCode,  
    extensionBlock [1] CaptureDeviceTechnologyIdExtensionBlock  
}  
  
ImageDataFormatCode ::= ENUMERATED {  
    pgm(0),  
    wsq(1),  
    jpeg2000Lossy(2),  
    jpeg2000Lossless(3),  
    png(4)  
}  
  
ImageDataFormatExtensionBlock ::= SEQUENCE {  
    ...  
}  
  
ImageDataFormat ::= CHOICE {  
    code [0] ImageDataFormatCode,  
    extensionBlock [1] ImageDataFormatExtensionBlock  
}  
  
CoordinateBlock ::= CoordinateCartesian2DUnsignedShortBlock  
  
CoordinatesBlock ::= SEQUENCE (SIZE(2..MAX)) OF CoordinateBlock
```



```

SegmentBlock ::= SEQUENCE {
    position [0] Position,
    enclosingCoordinatesBlock [1] CoordinatesBlock,
    orientation [2] INTEGER (0..255) OPTIONAL,
    qualityBlocks [3] QualityBlocks OPTIONAL,
    confidence [4] ScoreOrError OPTIONAL,
    ...
}

SegmentBlocks ::= SEQUENCE (SIZE(1..4)) OF SegmentBlock

SegmentationBlock ::= SEQUENCE {
    algorithmIdBlock [0] RegistryIdBlock,
    segmentBlocks [1] SegmentBlocks,
    ...
}

AnnotationReasonCode ::= ENUMERATED {
    unknown(0),
    other(1),
    amputated(2),
    unableToPrint(3),
    bandaged(4),
    physicallyChallenged(5),
    diseased(6)
}

AnnotationReasonExtensionBlock ::= SEQUENCE {
    fallback [0] AnnotationReasonCode,
    ...
}

AnnotationReason ::= CHOICE {
    code [0] AnnotationReasonCode,
    extensionBlock [1] AnnotationReasonExtensionBlock
}

AnnotationBlock ::= SEQUENCE {
    position [0] Position,
    reason [1] AnnotationReason,
    ...
}

UnitDimensionCode ::= ENUMERATED {
    inch(0),
    cm(1)
}

SpatialSamplingRateBlock ::= SEQUENCE {
    samplesPerUnit [0] INTEGER (0..65535),
    unitDimension [1] UnitDimensionCode
}

CaptureDeviceBlock ::= SEQUENCE {
    modelIdBlock [0] RegistryIdBlock,
    technologyId [1] CaptureDeviceTechnologyId OPTIONAL,
    certificationIdBlocks [2] CertificationIdBlocks OPTIONAL,
    ...
}

FingerRotation ::= INTEGER (0..359)

SegmentationBlocks ::= SEQUENCE OF SegmentationBlock

AnnotationBlocks ::= SEQUENCE OF AnnotationBlock

CommentBlock ::= VisibleString

CommentBlocks ::= SEQUENCE OF CommentBlock

VendorSpecificDataBlock ::= ExtendedDataBlock

```

```
VendorSpecificDataBlocks ::= SEQUENCE OF VendorSpecificDataBlock

RepresentationBlock ::= SEQUENCE {
    position [0] Position,
    impression [1] Impression,
    imageDataFormat [2] ImageDataFormat,
    imageData [3] OCTET STRING,
    captureDateTimeBlock [4] CaptureDateTimeBlock OPTIONAL,
    captureDeviceBlock [5] CaptureDeviceBlock OPTIONAL,
    qualityBlocks [6] QualityBlocks OPTIONAL,
    spatialSamplingRateBlock [7] SpatialSamplingRateBlock OPTIONAL,
    positionComputedByCaptureSystem [8] BOOLEAN OPTIONAL,
    originalRotation [9] FingerRotation OPTIONAL,
    imageRotatedToVertical [10] BOOLEAN OPTIONAL,
    imageHasBeenLossilyCompressed [11] BOOLEAN OPTIONAL,
    segmentationBlocks [12] SegmentationBlocks OPTIONAL,
    annotationBlocks [13] AnnotationBlocks OPTIONAL,
    pADDataBlock [14] PADDDataBlock OPTIONAL,
    commentBlocks [15] CommentBlocks OPTIONAL,
    vendorSpecificDataBlocks [16] VendorSpecificDataBlocks OPTIONAL,
    ...
}

RepresentationBlocks ::= SEQUENCE OF RepresentationBlock

FingerImageDataBlock ::= [APPLICATION 4] SEQUENCE {
    versionBlock [0] VersionBlock,
    representationBlocks [1] RepresentationBlocks,
    ...
}
```

END

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Annex A

ISO/IEC 39794-4:2019/Amd 1:2023

Insert the following text as Clause A.4.

<https://standards.iteh.ai/catalog/standards/sist/a5ab8953-644b-443f-8a5d-3c27841e36b7/iso-iec-39794-4-2019-amd-1-2023>

A.4 ANSI-NIST ITL Harmonized XML schema definition for XML encoding

```
<?xml version="1.0" encoding="utf-8" ?>
<!--Permission is hereby granted, free of charge in perpetuity, to any person obtaining
a copy of the Schema, to use, copy, modify, merge and distribute free of charge, copies
of the Schema for the purposes of developing, implementing, installing and using software
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following notice: THIS SCHEMA HAS BEEN MODIFIED FROM THE SCHEMA DEFINED IN ISO/IEC 19794-
4, AND SHOULD NOT BE INTERPRETED AS COMPLYING WITH THAT STANDARD-->
<xs:schema
    xmlns:xs="https://www.w3.org/2001/XMLSchema"
    xmlns:vc="https://www.w3.org/2007/XMLSchema-versioning"
    xmlns:cmn="https://standards.iso.org/iso-iec/39794/-1"
    xmlns="https://standards.iso.org/iso-iec/39794/-4/v2"
    vc:minVersion="1.0"
    targetNamespace="https://standards.iso.org/iso-iec/39794/-4/v2"
    elementFormDefault="qualified"
    attributeFormDefault="unqualified">
    <xs:import namespace=https://standards.iso.org/iso-iec/39794/-4 schemaLocation="iso-
    iec-39794-4-ed-1-v1.xsd" />
    <xs:complexType name="AnsiNistITLPalmPositionCodeType">
    <xs:choice>
```