

Modifications of the Type 17 Iris Record

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Technical Issues Addressed :: Ins and Outs

In

- » Rectilinear compact formats (ISF)
- » Compression algorithms (CGA)
 - » PNG (lossless)
 - » JPEG2000 (lossless + lossy)
- » Scan (IST)
 - » Progressive
 - » Undefined
- » Illumination (EAS)
 - » NIR [700,900]
 - » Defined spectrum [a,b]
 - » Visible + Red [Caveated]
- » Markup (xEB, OCC)
 - » Iris-sclera, Pupil-sclera, Eyelids
 - » Occlusions

Out

- » Polar formats
- » Compression algorithms
 - » JPEG
- » Scan
 - » Interlaced frame
 - » Interlaced field



Technical Issues Addressed :: Ins and Outs

In

- » Frontal gaze (GAZ)
 - » Angle between optical axis of eye and line connecting optical centers of eye and camera
- » Boundaries as N points (x,y)
- » Eye color (ECL)
 - » Estimating eye color ... subjective, ... very limited reliability despite its intuitive use in a policing context. It is determined by ... melanin pigmentation, and spectrum of the incident light. Historically unavailable to recognition algorithms, and not currently used.
- » Vocabulary issue (ELR)
 - » Eye label L/R/U vs. Feature Identifier

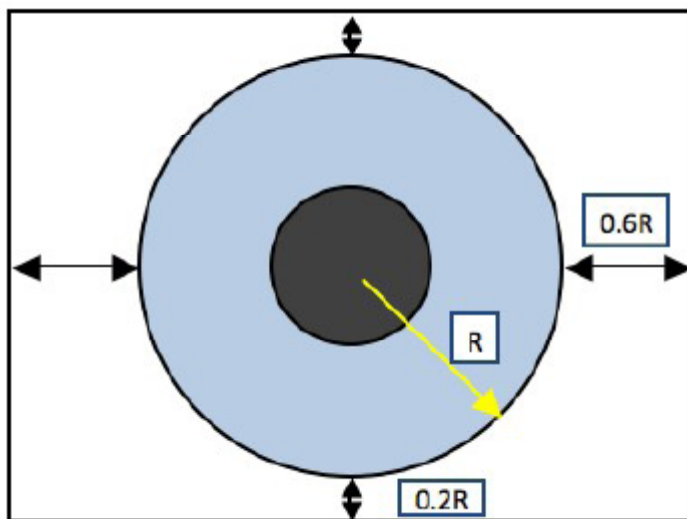
Out

- » Full pose description
 - » Head pose (RPY) AND
 - » Eye pose (RPY)
- » Boundaries as Fourier Descriptors
- » Transformation flags
 - » Dropped
- » Interlace options
 - » Interlaced imagery is prohibited

Iris Geometries :: Compact vs. Not

Table 75 Iris storage formats

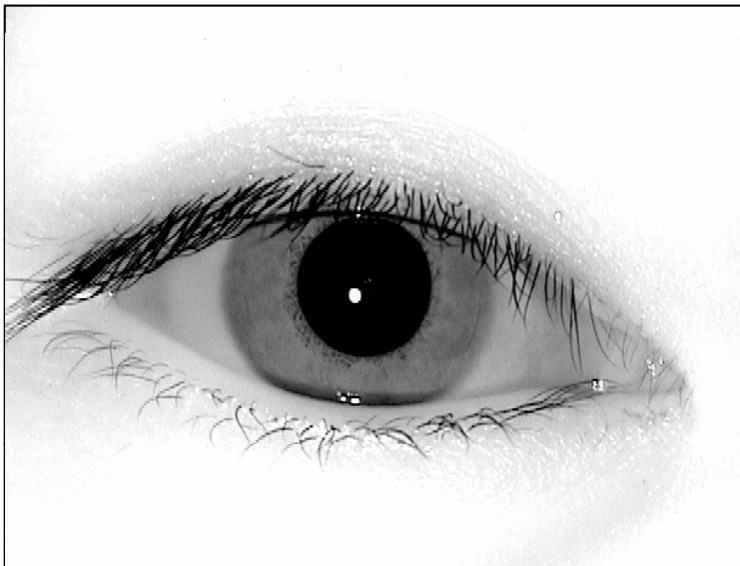
ISF code	Description	Iris Centering	Iris margin requirement	
			Horizontal	Vertical
1	Unconstrained	Recommended	$\geq 0.6R$	$\geq 0.2R$
2	Raw: 640x480	Recommended	$\geq 0.6R$	$\geq 0.2R$
3	Cropped	Required	$= 0.6R$	$= 0.2R$
7	Cropped and Masked	Required	$= 0.6R$	$= 0.2R$



No provision for storing irises that are too close to the boundary.

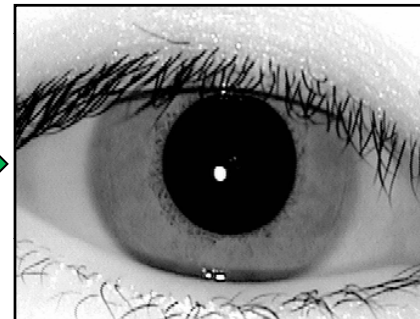
Type 17 :: New sets of fields 5 of 7 :: Compact

ISF	0	17.032	N	COMPACT STORAGE FORMAT	1	1
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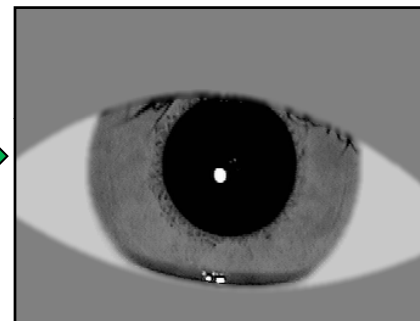
Parent image from camera

ISF 1



Cropped image

ISF 3



Cropped and masked image

ISF 7

Specialized image formats are standardized in
ANSI/NIST Type 17
ISO/IEC 19794-6:2011 Iris Image Format

Type 17 has new optional SAP field

» 7.13.3 Subject acquisition profile for iris

- » The SAP levels for iris acquisition are optional and are based upon those listed in the Mobile ID Best Practice Recommendation. They are entered in Field 17.031: Subject acquisition profile / SAP. Table 9 lists the differences between the SAP levels.

Table 9 Subject acquisition profiles for iris

CAPTURE	SAP 20	SAP 30	SAP 40
Iris diameter in true, non up-sampled pixels	≥ 140 pixels	≥ 170 pixels	≥ 210 pixels
Number of (quasi-) simultaneously captured eyes	≥ 1	≥ 1	2
Exposure time	≤ 33 ms	≤ 15 ms	≤ 10 ms
Viewfinder & image quality feedback	External or internal	Internal, optical or electronic	Internal, at least electronic

Thank You

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NIST

Type 17 :: Revise field 14 :: Rotation ??

- » Regarding 17.014: Rotation Angle of Eye (RAE)
 - » Currently encodes in-plane rotation *“This optional field shall indicate the rotation angle of the eye”*.
- » But could be extended
 - » Restate using Tait-Bryan (Y, P, R)
 - » Reword as *“This optional field gives an estimate of the angle between the optical axis of the eye and the optical axis of the camera, measured in degrees.”*

New topics 3 of 3, since July 27, yesterday

- » Proposal to remove ability to store color images in Type 17
 - » i.e. retain only grey-scale images
 - » Why? Because mainstream cameras all produce single luminance channel (from NIR illumination)
 - » Why not? The possibility to compare NIR enrollments with color search images, for example. The color image would be acquired in the visible.
 - » But interoperability concern would be that you could slip hyperspectral images into three RGB channels, without knowing what they mean.
 - » So keep color: But add text: “If the image is encoded as a color image, the illuminant shall be VIS”.