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## Section 1

### Glossary

- 1  
2  
3  
4 **ACE-V**  
5 Acronym for Analysis, Comparison, Evaluation - Verification.  
6  
7 **Ad Hoc Image**  
8 See *Uncontrolled Image*.  
9  
10 **AFR**  
11 Acronym for automated facial recognition.  
12  
13 **Analysis**  
14 (1) The assessment of an image to determine suitability for comparison, including the ability to discriminate  
15 significant features. (2) The first step of the ACE-V method.  
16  
17 **Anthropometric Analysis**  
18 Explicit measurement of landmarks on the face and a comparison of these measurements between two samples.  
19  
20 **Aspect Ratio**  
21 Ratio of width to height. This can be specific to pixels or images.  
22  
23 **Attempt**  
24 The submission of a single set of biometric samples to a biometric system for identification or verification. Some  
25 biometric systems permit more than one attempt to identify or verify an individual.  
26  
27 **Backlight**  
28 A light source placed behind a subject in a controlled capture that reduces background shadows.  
29  
30 **Batch Mode Search**  
31 A mode of searching in which a group of probes are simultaneously or sequentially launched. Such computer-  
32 resource intensive searches are usually performed during non-peak usage hours (e.g., nights or weekends). Also  
33 known as batch search mode.  
34  
35 **Bias**  
36 See *Cognitive Bias*, *Confirmation Bias*, and *Contextual Bias*.  
37  
38 **Binning**  
39 (1) Any technique used by a facial recognition (FR) system to organize or optimize searching based upon some  
40 piece(s) of metadata. (2) Process of parsing (examining) or classifying data in order to accelerate and/or improve  
41 biometric matching.  
42  
43 **Biometric Match**  
44 A determination that two samples correspond to the same source based on some level of computer-evaluated  
45 similarity. Does not inherently imply that the probe and candidate are the same person.  
46  
47  
48

**49 Biometrics**

50 A general term used alternatively to describe a characteristic or a process. (1) As a characteristic: a measureable  
 51 biological (anatomical and physiological) and behavioral characteristic that can be used for automated recognition.  
 52 (2) As a process: automated methods of recognizing an individual based on measureable biological (anatomical and  
 53 physiological) and behavioral characteristics.

**54**  
**55 Capture**

56 The process of collecting a biometric sample from an individual via a sensor.  
 57

**58 Certification Authority**

59 A body that issues a biometric document and certifies that the data stored on the document is genuine in a way  
 60 which will enable detection of fraudulent alteration.  
 61

**62 Class Characteristics**

63 Characteristics common to many individuals (e.g., the overall shape of the nose, eyes, or mouth).  
 64

**65 Cognitive Bias**

66 (1) A mental error caused by one's simplified information processing strategies. It does not result from any  
 67 emotional or intellectual predisposition toward a certain judgment, but rather from subconscious mental procedures  
 68 for processing information. (2) A mental error that is consistent and predictable. (3) Influences that may affect the  
 69 reliability and validity of one's observations and conclusions.  
 70

**71 Comparison**

72 (1) The observation of two or more faces to determine the existence of discrepancies, dissimilarities, or similarities.  
 73 (2) The second step of the ACE-V method.  
 74

**75 Compression**

76 The process of reducing the size of a data file.  
 77

**78 Conclusion**

79 A reasoned deduction or inference.  
 80

**81 Confirmation Bias**

82 Tendency to search for data or interpret information in a manner that supports one's preconceptions.  
 83

**84 Control**

85 A sample or standard against which other conditions can be compared in a scientific experiment.  
 86

**87 Controlled Image**

88 An image captured in accordance with facial identification (FI) or facial recognition (FR) standards or guidelines  
 89 (e.g., a drivers license photo).  
 90

**91 CSI Effect**

92 The perception of the near-infallibility of forensic science in response to popular media.  
 93

**94 Digital Zoom**

95 A digital camera function used to make the image seem more close up by cropping and enlarging a photo. Digital  
 96 zoom is misleading because it enlarges the image without adding extra details.  
 97

**98 DMV**

99 Acronym for Department of Motor Vehicles or Division of Motor Vehicles.  
 100

**101 Enroll**

102 The act of capturing a facial image, creating a template, and entering the template into a FR gallery.  
 103  
 104

**105 Evaluation**

106 (1) Ascertaining the value of dissimilarities and similarities between two facial images. (2) The third step of the  
 107 ACE-V method where an examiner assesses the value of the details observed during the analysis and comparison  
 108 steps and reaches a conclusion.

**110 EXIF**

111 (1) Acronym for exchangeable image file format. (2) EXIF is a specification for the image file format used by some  
 112 digital cameras to add image capture metadata to file formats such as JPEG, TIFF, and RIFF WAV.

**114 Expression**

115 Facial aspects resulting from muscle movement or position.

**117 Face Detection**

118 Automated determination of the locations and sizes of human faces in digital images.

**120 Face Recognition**

121 A biometric modality that uses an image of the visible physical structure of an individual's face for recognition  
 122 purposes.

**124 Facial Examination**

125 Formal systematic examination (e.g., ACE-V) of two images to determine if the same person is depicted in both.

**127 Facial Identification**

128 The manual examination of the differences and similarities between two facial images or a live subject and a facial  
 129 image (one-to-one) for the purpose of determining if they represent the same person.

**131 Facial Review**

132 (1) The review of a FR system candidate list to identify a possible match. (2) One-to-one comparison (verification)  
 133 conducted in a high-throughput environment (e.g., border crossing).

**135 Facial Mapping**

136 (1) The process of landmarking defined anthropological points. (2) A colloquial term often mistakenly used to  
 137 describe facial comparison.

**139 Facial Recognition**

140 The automated searching of a facial image in a biometric database (one-to-many), typically resulting in a group of  
 141 facial images ranked by computer-evaluated similarity.

**143 Features**

144 (1) Observable class or individual characteristics. (2) The components of biometric templates.

**146 FI**

147 Acronym for Facial Identification.

**149 FR**

150 Acronym for Facial Recognition.

**152 Frontal Pose**

153 A facial image captured from directly in front of the subject with the focal plane approximately parallel to the plane  
 154 of the subject's face.

**156 Gallery**

157 The FR system's database, which typically contains all known-person images and templates.

**159 Guideline**

160 Recommended practice that allows some discretion or leeway in its interpretation, implementation, or use.

- 161  
162 **HDMI**  
163 (1) Acronym for High-Definition Multimedia Interface. (2) An audio/video interface for transmitting uncompressed  
164 digital data.  
165  
166 **Histogram**  
167 A graph of a frequency distribution in which rectangles with bases on the horizontal axis are given widths equal to  
168 the class intervals and heights equal to the corresponding frequencies. In digital images, a histogram is frequently  
169 used to document the number of pixels of a given brightness value (e.g., 0-255).  
170  
171 **Holistic Comparison**  
172 The process of comparing faces by looking at the face as a whole and not the component parts in isolation.  
173  
174 **Hot Spots**  
175 Bright areas of light reflecting on a face that reduce visibility of features.  
176  
177 **Human Facial Recognition**  
178 The mental process by which an observer identifies a person as being one they have seen before.  
179  
180 **Identification**  
181 (1) Determination that class characteristics and overall morphology correspond between two faces. (2) A task where  
182 the biometric system searches a database for a reference matching a submitted biometric sample and, if found,  
183 returns a corresponding identity. (3) See *Individualization*.  
184  
185 **Identity**  
186 Within a biometric system, the collective set of biographic data, images, and templates assigned to one person.  
187  
188 **Individual Characteristics**  
189 Characteristics allowing one to differentiate between individuals having the same class characteristics (e.g., freckles,  
190 moles, and scars).  
191  
192 **Individualization**  
193 The determination of an examiner that there is sufficient quality and quantity of detail in agreement to conclude that  
194 two images depict the same person.  
195  
196 **Interpolation**  
197 A method of image processing whereby one pixel, block, or frame is stored based on the differences between the  
198 previous and subsequent pixel, block, or frame information (Encyclopedia of Photography, 3rd edition). This is  
199 often done to increase the apparent clarity of an image.  
200  
201 **Levels of Conclusion**  
202 A verbal or numeric scale that indicates the level of confidence regarding identification or exclusion of a subject.  
203  
204 **Lights Out**  
205 An automated decision based upon threshold scores with no human involvement.  
206  
207 **Lossless Compression**  
208 File reduction process in which no data is lost and all data can be retrieved in its original form (e.g., TIF with LZW  
209 compression).  
210  
211 **Lossy Compression**  
212 File size reduction process in which data is lost and cannot be retrieved in its original form (e.g., high-compression  
213 JPEG).  
214  
215 **Match/Matching**  
216 See *Identification*.

217	<b>Metadata</b>
218	Non image-based information associated with an image file.
219	
220	<b>Morphological Analysis</b>
221	The direct comparison of class and individual facial characteristics without explicit measurement.
222	
223	<b>Occlusion</b>
224	An object that obscures facial features (e.g., sunglasses or objects in the environment, such as a tree).
225	
226	<b>Perspective</b>
227	Camera to subject geometry, including both camera to subject distance and orientation of the camera relative to the subject.
228	
229	
230	<b>Perspective Distortion</b>
231	Facial feature warping or transformation introduced by insufficient subject to camera distance (e.g., larger nose or smaller ears). Photographing faces from a distance of less than two meters introduces noticeable perspective distortion.
232	
233	
234	
235	<b>Photo-Anthropometry</b>
236	The application of anthropometric analysis to images.
237	
238	<b>Photographic Comparison</b>
239	An assessment of the correspondence between features in images and known objects or images for the purpose of rendering an expert opinion regarding identification, elimination, or a qualified conclusion (as opposed to a demonstrative exhibit).
240	
241	
242	
243	<b>Pitch</b>
244	The rotation in degrees about the (horizontal) x-axis. Frontal poses have a pitch angle of 0 degrees. Positive angles represent faces looking down (a counter-clockwise rotation around the x-axis). (ISO/IEC 19794-5).
245	
246	
247	<b>Pose</b>
248	The orientation of the face with respect to the camera, consisting of pitch, roll, and yaw. Common poses are frontal and profile.
249	
250	
251	<b>Probabilistic Model</b>
252	Statistical analysis tool that estimates, on the basis of past (historical) data, the probability of an event occurring again.
253	
254	
255	<b>Probe</b>
256	The facial image searched against the gallery in an FR system.
257	
258	<b>RAW</b>
259	A digital camera or scanner file format, usually proprietary, for minimally processed digital image data.
260	
261	<b>Recognition</b>
262	(1) See <i>Human Facial Recognition</i> . (2) See <i>Face Recognition</i> .
263	
264	<b>Registration</b>
265	(1) Enrollment of an identity in a biometric system. (2) The process by which two facial images are sized and aligned with each other for direct comparison.
266	
267	
268	<b>Relative Frequency</b>
269	How often facial features or combinations thereof occur in a given population.
270	
271	
272	

- 273 **Resolution**  
 274 The act, process, or capability of distinguishing between two separate but adjacent elements of detail in an image.  
 275 Resolution normally has three components: spatial (e.g., pixels per inch), spectral (e.g., number of colors), and  
 276 radiometric (e.g., number of shades).  
 277
- 278 **Roll**  
 279 The rotation in degrees about the z-axis (the horizontal axis from front to back). Frontal poses have a roll angle of  
 280 zero degrees. Positive angles represent faces tilted toward their right shoulder (counter-clockwise rotation around  
 281 the z-axis). A roll angle of zero degrees denotes that the left and right eye centers have identical Y coordinates  
 282 (ISO/IEC 19794-5).  
 283
- 284 **SAP**  
 285 Acronym for Subject Acquisition Profile.  
 286
- 287 **Search**  
 288 The act of comparing a probe against a gallery.  
 289
- 290 **Search Result Set**  
 291 The candidate list returned from a search.  
 292
- 293 **Spoofing**  
 294 In a biometric system, the process by which an imposter is recognized as another person or is missed as an existing  
 295 identity in the gallery.  
 296
- 297 **sRGB**  
 298 (1) Acronym for standard red, green, and blue. (2) Standard default color space used for the Internet and for  
 299 displaying or printing images.  
 300
- 301 **Standard**  
 302 Protocols established and recognized by the relevant community.  
 303
- 304 **Subject Acquisition Profile**  
 305 Facial image capture criteria described in ANSI/NIST-ITL 1-2007 (e.g., SAP Level 40 includes the requirement for  
 306 768 x 1024 pixels).  
 307
- 308 **Superimposition**  
 309 The use of a registered overlay as an aid to comparison.  
 310
- 311 **System Bias**  
 312 (1) Errors repeatedly introduced through automation (e.g., errors in template generation or comparison). (2) Errors  
 313 repeatedly introduced through operational practices in an organization or unit (e.g., improper lighting or camera  
 314 position guidance).  
 315
- 316 **Template**  
 317 A set of biometric measurement data prepared by an FR system from a facial image.  
 318
- 319 **Third Party Imagery**  
 320 Images utilized in FR or FI that were not captured by the agency performing the comparison (e.g., family snapshots  
 321 of a missing person).  
 322
- 323 **Uncontrolled Image**  
 324 An image not captured in accordance with FI/FR standards or guidelines (e.g., a surveillance image).  
 325
- 326 **Verification**  
 327 (1) In a biometric system, the process of conducting a one-to-one comparison. (2) A review and independent  
 328 analysis of the conclusion of another examiner. (3) The final step of the ACE-V method.

- 329 **Yaw**  
330 The rotation in degrees about the y-axis (vertical axis). Frontal poses have a yaw angle of zero degrees. Positive  
331 angles represent faces looking to their left (a counter-clockwise rotation around the y-axis). (ISO/IEC 19794-5).  
332  
333 **YUV422**  
334 A color space standard used by many digital video cameras.  
335

DRAFT

336 **Reference List**

337  
338  
339  
340

FISWG documents can be found at:  
[www.FISWG.org](http://www.FISWG.org)

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