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Standard Guide for Facial Image Comparison Feature List for Morphological Analysis¹

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1. Scope

1.1 This guide defines a set of facial components, characteristics, and descriptors to be considered during a morphological facial comparison (see FISWG Best Practices for Facial Image Comparison Feature List for Morphological Analysis).

1.2 This set of facial components, characteristics, and descriptors describes the facial features that may be visible and comparable between images.

1.3 This guide defines a standard set of facial components, characteristics, and descriptors that should be used for facial comparison.

1.4 This guide does not define the comparison process itself, just the feature set to be used during such comparisons.

1.5 This guide does not define a classification system to constrain how those descriptors shall be articulated as applied to samples.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 FISWG Standards:²

FISWG Best Practices for Facial Image Comparison Feature List for Morphological Analysis

¹ This guide is under the jurisdiction of ASTM Committee E30 on Forensic Sciences and is the direct responsibility of Subcommittee E30.12 on Digital and Multimedia Evidence.

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² Available from Facial Identification Scientific Working Group (FISWG), <http://www.fiswg.org/documents>.

3. Terminology

3.1 Definitions:

3.1.1 *characteristic descriptors, n*—minutiae of the component characteristics.

3.1.2 *component characteristics, n*—detailed features of the facial components.

3.1.3 *facial components, n*—gross features considered in virtually all comparisons.

4. Significance and Use

4.1 Morphological analysis used for facial comparison should utilize consistent terminology and methodology. This guide provides a standard set of facial components, characteristics, and descriptors to be used as a framework in conjunction with a systematic method of analysis for facial image comparison.

4.2 The order of the facial components in this set is presented from the top of the face to the bottom, not in order of importance or priority.

4.3 Within this guide, the term “face” generally refers to the face, head, and neck inclusively unless specified otherwise.

4.4 There are several instances in this guide in which the term “distance” or “approximate distance” is used. When this term is used in this guide, it does not mean to imply that the precise value of this dimension shall be determined, but rather the relative size of this dimension compared to the overall width or height of the face, if not otherwise specified. In this guide, it is recommended that photoanthropometry not be used at all because of its limitations.

5. Facial Feature List

5.1 The following feature list contains nineteen (19) facial components, each of which is further divided into two levels of detail.

5.2 The facial components are gross features to be considered in virtually all comparisons. The tables in 5.3 further expands each facial component into a set of component characteristics and their associated characteristic descriptors.

NOTE 1—In the figures, dotted lines indicate the position, orientation, or location of the feature, or combination thereof.

5.3 Facial Components—The human facial components are multifaceted and when imaging conditions allow, it may be possible to subdivide these components further. Any standard procedure using facial comparison analysis should consider all of the following facial components: Skin, Face/Head Outline, Face/Head Composition, Hair, Forehead, Eyebrows, Eyes, Cheeks, Nose, Ears, Mouth, Chin/Jawline, Neck, Facial Hair, Facial Lines, Scars, Facial Marks, and Alterations. If features are present and observable on a face that cannot fit into the categories below, those features should be considered and included as part of 5.3.19.

5.3.1 Skin—“Skin” refers to the overall appearance of the skin. See Table 1.

TABLE 1 Skin

Component Characteristics	Characteristic Descriptors
Overall skin appearance	• Overall texture • Overall tone (for example, luminance, and color)

5.3.2 Face/Head Outline—“Face/head outline” refers to the overall shape of the head (cranial vault) and face. See Table 2 and Fig. 1.

TABLE 2 Face/Head Outline

Component Characteristics	Characteristic Descriptors
Shape of cranial vault	• Portrait contour • Profile contour
Overall shape of face	• Portrait contour • Profile contour

5.3.3 Face/Head Composition—“Face/head composition” refers to the overall configuration of the facial components, to include their alignment and relative sized, internal to a single face. See Table 3 and Figs. 2³ and 3.

TABLE 3 Face/Head Composition

Component Characteristics	Characteristic Descriptors
Proportions/position of features on face	• Approximate width of nose relative to eye distances (for example, interpupillary distance, individual eye width, or overall distance between outer corners) • Approximate width of mouth relative to eye distances • Approximate width of nose relative to mouth • Approximate distance from nose to upper lip relative to face length • Approximate distance from chin to lower lip relative to face length • Ear position relative to eyes, nose, and mouth • Eye position relative to face length

5.3.4 Hair—“Hair” refers to the shape and distribution of head hair and does not include other facial hair (eyebrows, lashes, facial hair). Hair includes the appearance of the hair itself and the sections of hairline and baldness patterns. Hairline refers to the contour of the edge of the hair along the top and sides of the forehead to the top of the ears. Cranial baldness pattern refers to apparent baldness affecting the hairline as well as gaps on the crown and sides of the head. See Table 4 and Fig. 4.

TABLE 4 Hair

Component Characteristics	Characteristic Descriptors
Hair	• Shape/spatial distribution (including overall hair length) • Texture • Symmetry • Density and distribution of density (including gaps) • Tonality and variation in color/tonality
Forehead hairline	• Detailed shape (for example, symmetry, “widow’s peak,” “part line,” “cowlick”)
Hairline right side Hairline left side	• Detailed shape
Cranial baldness pattern	• Detailed shape and distribution

5.3.5 Forehead—“Forehead” refers to the part of the face above the eyes, including the brow ridges. See Table 5 and Fig. 5.

TABLE 5 Forehead

Component Characteristics	Characteristic Descriptors
Forehead shape	• Relative height • Relative width • Slope/contour (visible in profile)
Brow ridges	• Prominence • Continuity

5.3.6 Eyebrows—“Eyebrows” refers to the strips of hair above the eyes. See Table 6 and Fig. 6.

TABLE 6 Eyebrows

Component Characteristics	Characteristic Descriptors
Right eyebrow Left eyebrow	• Shape (may include detailed observations) • Size (width and length of eyebrow relative to eye size) • Lateral eyebrow vertical end position relative to medial eyebrow vertical position (tilt of eyebrow) (“A” in Fig. 6) • Vertical end position of lateral eyebrow relative to the lateral canthus (“B” in Fig. 6) • Vertical end position of medial eyebrow relative to the medial canthus (“C” in Fig. 6) • Horizontal end position of lateral eyebrow relative to lateral canthus (“D” in Fig. 6) • Horizontal end position of medial eyebrow relative to medial canthus (“E” in Fig. 6) • Conjoined left-right eyebrows (“unibrow”) • Density of hair within eyebrow and distribution of density • Hair details (for example, texture, length, thickness, shape, and color) • Noticeably longer hairs
Asymmetry between right and left eyebrows	• Overall shape, size, position, hair details, and so forth (see individual eyebrow descriptors)

5.3.7 Eyes—“Eyes” refers to the orbital region below the eyebrows and above the cheeks. See Table 7 and Figs. 7–9.

TABLE 7 Eyes

Component Characteristics	Characteristic Descriptors
Interocular distance	• Distance between inner corners of the right and left eyes

³ Vegter, F., and Hage, J., “Clinical Anthropometry and Canons of the Face in Historical Perspective,” *Plastic and Reconstructive Surgery*, Vol 106, No. 5, 2000, pp. 1090–1096.