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1. Scope

1.1 The purpose of this document is to provide guidance for the use of Analysis, Comparison, Evaluation, and Verification (ACE-V) methodology in one-to-one facial comparisons.

1.2 This document describes the various steps within the methodology of ACE-V.

2. Referenced Documents

2.1 ASTM Standards:\footnote{1}

- E3149 Facial Image Comparison Feature List for Morphological Analysis
- E2917 Standard Practice for Forensic Science Practitioner Training, Continuing Education, and Professional Development Programs

2.2 FISWG Documents:\footnote{2}

- FISWG Glossary

\footnotetext[1]{For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard’s Document Summary page on the ASTM website.}

\footnotetext[2]{Available from Facial Identification Scientific Working Group (FISWG), http://www.fiswg.org/documents.}
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3.1.3 Evaluation: (1) the third step of the ACE-V method, where a practitioner assesses the value of the details observed during the analysis and comparison steps and reaches an opinion (2) ascertaining the value of dissimilarities and similarities between two or more samples.

3.1.4 Verification: (1) the final step of the ACE-V method; (2) the review and independent analysis of the conclusion of another practitioner.

3.1.5 One-to-One comparison: the direct comparison of facial features in one image to facial features in another image by a trained practitioner.

3.2 Acronyms:

3.2.1 ACE-V: analysis, comparison, evaluation, and verification

4. Significance and Use

4.1 This document outlines the methods and criteria to be applied during a one-to-one comparison.

4.2 The documentation of the ACE-V process during comparison should follow the FISWG Minimum Guidelines for Facial Image Comparison Documentation.

5. Applying ACE-V to One-to-One Comparisons

5.1 Analysis: the step during which a practitioner considers the questioned image(s) or known image(s) in terms of its properties and facial features to assess whether a given image is suitable for comparison.

5.1.1 The practitioner should visually analyze the questioned image(s) before the known image(s).
5.1.2 Visual analysis should include, but is not limited to the following considerations:

5.1.2.1 Imaging factors (see FISWG Image Factors to Consider in Facial Image Comparison)

5.1.2.2 Image capture timeframe

5.1.2.3 Image alterations (e.g., filters, enhancements)

5.1.3 Subject factors (see FISWG Facial Images Comparison Feature List for Morphological Analysis and FISWG Physical Stability of Facial Features of Adults)

5.1.4 Image processing tools may be used to aid in the analysis and suitability determination.

5.1.5 It is beyond the capacity of this document to define the criteria that determine if an image is suitable for comparison. For example, there is currently no established criteria related to the quality of an image as it relates to facial comparisons.

5.1.6 If the images (questioned and known) are deemed to be suitable for comparison, the practitioner will move on to the comparison step. The determination of image suitability is based on the practitioner’s subjective assessment of whether or not an image has sufficient detail and comparability for a reliable and meaningful examination.

5.2 Comparison: the step during which the practitioner conducts a visual side by side comparison of facial images utilizing morphological analysis (see FISWG Facial Images Comparison Feature List for Morphological Analysis) and considering physical stability.
5.2.1 Practitioners should note any similarities or dissimilarities, along with any associated considerations where necessary (see step 5.1.2).

5.2.2 The practitioner may utilize image processing tools to aid in the Comparison step. Image processing should be kept to a minimum as it may introduce artifacts to the imagery or eliminate/alter facial characteristics (see FISWG Image Processing Techniques for Facial Image Comparison).

5.2.3 The practitioner may produce visual aids in which they annotate images to demonstrate the noteworthy facial features in the comparison (see FISWG Facial Image Comparison Best Practices for Markups & Annotations).

5.3 Evaluation: The step during which a practitioner evaluates the clarity, quantity, specificity, reproducibility, persistence, and the extent of observed similarities or dissimilarities of facial features and expected variations to form an opinion.

5.3.1 Expected variations that should be considered during the evaluation include, but are not limited to:

5.3.1.1 Stability of features (see FISWG Physical Stability of Facial Features of Adults)

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4 See OSAC definition “view, judgment, belief – takes into consideration other information in addition to observations, data, calculations, and interpretations”
5.3.1.2 Imaging Factors (see FISWG Image Factors To Consider In Facial Image Comparison)

5.3.2 During this step, the practitioner will reach an opinion by weighing the extent of similarities or dissimilarities, and any expected variations in the facial images as analyzed and compared in the previous steps.

5.3.3 At this time, there is no discipline-specific opinion scale for facial comparisons. There is an OSAC Standard Guide for Image Comparison Opinions (OSAC 2022-S-0001) that should be referenced when creating an opinion scale.

- Agencies should define the opinion scale utilized in conducting the facial comparison to include the following:
  - Consideration of alternative propositions (both the propositions of same source and of different source).
  - Criteria necessary to reach each of the opinions.

5.3.3.2 An opinion shall not be expressed as an absolute certainty. The following words or phrases shall not be used when expressing an opinion: “‘individualize,’ ‘individualization,’ ‘identifies,’ ‘identification,’ ‘includes,’ ‘inclusion,’ ‘excludes,’ ‘exclusion’, ‘to the exclusion of all others’.

5.4 Verification: The step in which the analysis, comparison, and evaluation steps shall be completed by a second, independent practitioner. Verification can be performed blindly (without knowledge of the other practitioner’s opinion) or non-blind (performed with knowledge of the other practitioner’s opinion).
5.4.1 A statement of verification (all opinions) shall be included within the documentation (see FISWG Minimum Guidelines for Facial Image Comparison Documentation) of a requested comparison. This documentation should be completed by all practitioners who have rendered an opinion of the same requested comparison. The number of practitioners verifying may vary and be agency specific.

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