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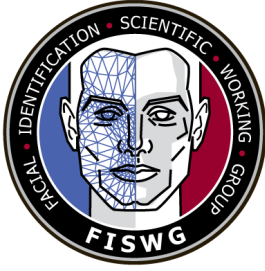
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Minimum Training Criteria When Using Facial Recognition Systems

1. Purpose

1.1 This document is intended to provide minimum training criteria for personnel who conduct facial comparisons using candidate images from facial recognition systems (FRS).

2. Introduction

2.1 An FRS typically provides a list of candidates from a database in response to a facial image query. The user of an FRS and the personnel reviewing the results are required to be aware of the major elements and limitations of the facial comparison discipline and training in the use of available tools.

2.2 The intended audience of this document includes agencies and individuals utilizing an FRS to search an image or receive a candidate list.

3. Referenced Documents

3.1 *ASTM Standards*:¹

¹ For referenced ASTM standards, visit www.nist.gov/osac/astm-launch-code, or 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.

14 E2916-19e1 Terminology for Digital and Multimedia Evidence Examination

15 E3149-18 Standard Guide for Facial Image Comparison Feature List for
16 Morphological Analysis

17 3.2 *FISWG Standards:*²

18 FISWG Facial Image Comparison Feature List for Morphological Analysis

19 FISWG Glossary

20 FISWG Physical Stability of Facial Features of Adults

21 FISWG Guide for Role-Based Training in Facial Comparison

22 FISWG Guide for Facial Comparison Training of Reviewers to Competency

23 FISWG Minimum Guidelines for Facial Image Comparison Documentation

24 **4. Terminology**

25 4.1 *Definitions of Terms Specific to This Standard:*

26 4.1.1 *CSI effect*—the perception of the near-infallibility of forensic science
27 in response to popular media.

28 4.1.2 *face recognition*—see facial recognition.

29 4.1.3 *facial recognition*— (1) the human cognitive process by which an observer

² Available from Facial Identification Scientific Working Group (FISWG),

30 identifies a person as being one they have seen before, (2) the automated searching
31 of a facial image (probe) against a known collection resulting in a list of candidates
32 ranked by computer-evaluated similarity score. This automated process is commonly
33 referred to as a one-to-many comparison.

34 4.1.4 *holistic process*—the innate human ability of comparing faces by looking at
35 the face as a whole without specifically considering the component parts in isolation.

36 4.1.5 *intentional alteration*—a temporary or permanent deliberate modification to
37 the face (e.g., tattoos, piercings, make-up).

38 4.1.6 *unfamiliar faces*—Faces of unknown or recently learned people.

39 4.1.6.1 Discussion: Unfamiliar faces characterize almost all of face identification
40 decisions made in forensic contexts, as the observer has no previous history with the
41 person they are required to identify.

42 4.2 *Acronyms:*

43 4.2.1 *CSI—crime scene investigation*

44 4.2.2 *FR—facial recognition*

45 **5. Agency Considerations Related to Training**

46 5.1 Agencies shall document completion of training and the competency of
47 their users.

48 5.2 Agencies shall include competency testing as a component of training and

49 quality assurance programs as a reliable means of measuring the quality of each
50 user's ability to perform work. Competency testing measures individual performance
51 and may help identify opportunities for continuing education and training.

52 5.3 The material provided below represents the minimum training criteria which
53 may be tailored to meet the individual agency's operational needs. FISWG
54 discourages the use of an FRS by users who have not successfully completed the
55 minimum training and strongly encourages further user training beyond the minimum
56 criteria. Resources for additional training information include, but are not limited to,
57 FISWG Guide For Facial Comparison Training Of Reviewers To Competency and
58 FISWG Role-Based Training In Facial Comparison.

59 **6. Training Recommendations**

60 6.1 The user should be familiar with the history of facial comparisons in
61 forensic science to include past methods and their shortcomings.

62 6.2 The user shall understand common terminology used in the discipline and
63 be able to explain the following (including differences and limitations):

64 6.2.1 Human face recognition (familiar/eyewitness)

65 6.2.2 Automated face recognition

66 6.2.3 Holistic face processing

67 6.2.4 Unfamiliar face matching

68 6.3 The user shall demonstrate an understanding of the basics of image
69 science including, but not limited to:

70 6.3.1 Human Vision (e.g., color, perception)

71 6.3.2 Photography (e.g., distortions, pose, illumination)

72 6.3.3 Components of digital images and compression (e.g., pixels, resolution)

73 6.3.4 Awareness of possible image alterations (intentional or unintentional)

74 6.3.5 Properties of video (e.g., limitations, formats, extraction of still images)

75 6.4 The user should be familiar with the proper handling of digital media,
76 write protection of that media, and generating working copies.

77 6.5 The user shall understand the principles of comparison. These
78 principles include:

79 6.5.1 Process of Analysis, Comparison, Evaluation, and Verification (ACE-V).

80 6.5.2 Assessment of facial image quality to determine the value for
81 comparison based on visibility of facial features.

82 6.5.3 The differences between class and individual characteristics.

83 6.5.4 Methods of Facial Comparisons

84 6.5.5 Morphological Analysis (the FISWG-recommended technique).

85 6.5.6 Superimposition (a technique which is only recommended by FISWG)

86 when used in conjunction with morphological analysis).

87 6.5.7 Photo-anthropometry and its limitations (a technique which is
88 not recommended by FISWG for facial review).

89 6.5.8 Opinion scale and levels of support relevant to facial review (e.g.,
90 exclusion, investigative lead).

91 6.5.9 Familiarity with scientific research related to the validity of facial
92 comparison methods, including strengths and limitations of any empirical studies
93 that have been conducted to test the accuracy of those methods.

94 6.5.10 Overview and effects of cognitive bias, to include confirmation bias.

95 6.6 The user should have a general knowledge of automated facial
96 recognition systems, to include, but not limited to:

97 6.6.1 User input and operation

98 6.6.2 System operation and output

99 6.6.3 Facial recognition algorithm limitations including, but not limited to:

100 6.6.3.1 Imaging conditions (e.g., image quality, lighting, pose)

101 6.6.3.2 Obstructions and accessories (e.g., eyeglasses, jewelry, masks,
102 scarves, head coverings)

103 6.6.3.3 Demographic performance variations

104 6.7 The user should be familiar with basic image processing operations
105 (e.g., brightness adjustments, rotations, cropping).

106 6.8 The user shall have a basic knowledge of the FISWG Facial Image
107 Comparison Feature List for Morphological Analysis (see also, ASTM E3149-18
108 Standard Guide for Facial Image Comparison Feature List for Morphological
109 Analysis).

110 6.9 The user should be aware of the variable nature of the human face over time
111 and the physical stability of individual features as they relate to expression, time-
112 related changes, weight change, changes in health and intentional alteration.

113 6.10 The user should be prepared to testify. Basic training for court testimony,
114 including knowledge of individual agency policies and procedures is beyond the
115 scope of this document and is the responsibility of the user's agency. However,
116 users should be aware of the following:

117 6.10.1 Their agency's authorities and policies regarding acceptable use of FRS
118 and dissemination of comparison information.

119 6.10.2 The response(s) of the legal system to the admission and use of facial
120 recognition and identification, and the perceptions of the public to facial recognition
121 and identification (e.g., "the CSI effect").

122 6.10.3 Proper chain of custody, documentation, notes, reporting of results,
123 and technical review.

124 6.11 The user should understand the results of FRS candidate review and
125 resulting action(s).

126 6.11.1 The user shall be aware FRS generated investigative leads are NOT
127 positive identifications.

128 6.11.2 Any possible connection or involvement of any subject shall be
129 determined through further investigation.

130 6.11.3 For administrative purposes, important decisions, such as negative
131 administrative actions or penalties, should not be taken based exclusively on
132 the potential candidate reported.

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FISWG documents can be found at www.fiswg.org.