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Minimum Training Criteria When Using Facial Recognition Systems

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25 Purpose

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

29 1. Introduction

30 1.1 An automated FRS typically provides a list of candidates from a database in
31 response to a facial image query. A user of an FRS and the personnel reviewing the
32 results are required to be aware of the major elements and limitations of the facial
33 comparison discipline and training in the use of available tools. Results from an
34 automated FRS are used as investigative leads only and should be used in conjunction
35 with additional resources.

36 1.2 The intended audience of this document includes agencies and individuals
37 utilizing an automated FRS to search an image or receive a candidate list.

38 **2. Referenced Documents**

39 2.1 American Society for Testing and Materials (ASTM) International Standard¹
40 E2916-19e1 Standard Terminology for Digital and Multimedia Evidence Examination
41 <https://www.astm.org/Standards/E2916.htm>

42 2.2 FISWG Glossary

43 2.3 FISWG Guidelines for Recommendations for Facial Comparison Training to
44 Competency

45 2.4 FISWG Recommendations for a Training Program in Facial Comparison

46 2.5 FISWG Physical Stability of Facial Features of Adults

47 **3. Terminology**

48 3.1 *Definitions:*

49 3.1.1 *CSI effect:* *n*–the perception of the near-infallibility of forensic science in
50 response to popular media.

51 3.1.2 *face recognition:* *n*–see facial recognition.

52 3.1.3 *facial recognition:* *n*–(1) the human cognitive process by which an observer
53 identifies a person as being one they have seen before, (2) the automated searching of
54 a facial image (probe) against a known collection resulting in a list of candidates ranked
55 by computer-evaluated similarity score. This automated process is commonly referred to

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.

56 as a one-to-many comparison.

57 3.1.4 *intentional alteration: n*—a temporary or permanent deliberation modification to
58 the face (e.g., tattoos, piercings, make-up).

59 3.2 *Acronyms:*

60 3.2.1 *CSI—crime scene investigation*

61 3.2.2 *FR—facial recognition*

62 **4. Agency Considerations Related to Training**

63 4.1 Agencies shall document completion of training and the competency of their
64 users.

65 4.2 Agencies shall include competency testing as a component of training and
66 quality assurance programs as a reliable means of measuring the quality of each user's
67 ability to perform work. Competency testing measures individual performance and may
68 help identify opportunities for continuing education and training.

69 4.3 The material provided below represents the minimum training criteria which may
70 be tailored to meet the individual agency's operational needs. FISWG discourages the
71 use of an FRS by users who have not successfully completed the minimum training and
72 strongly encourages further user training beyond the minimum criteria. Resources for
73 additional training information include, but are not limited to, *FISWG Guidelines for*
74 *Recommendations for Facial Comparison Training to Competency* and *FISWG*
75 *Recommendations for a Training Program in Facial Comparison.*

76 **5. Training Requirements**

77 5.1 The user should be familiar with the history of facial comparisons in forensic
78 science to include past methods and their shortcomings.

79 5.2 The user shall understand common terminology and should be able to explain
80 human face recognition (familiar/eyewitness) and automated facial recognition, as well
81 as explain the differences, their distinction from holistic face processing and unfamiliar
82 face matching.

83 5.3 The user shall demonstrate an understanding of the basics of image science
84 including, but not limited to:

85 5.3.1 Human Vision (e.g., color, perception).

86 5.3.2 Photography (e.g., distortions, pose, illumination).

87 5.3.3 Components of digital images and compression (e.g., pixels, resolution).

88 5.3.4 Awareness of possible image alterations (intentional or unintentional).

89 5.3.5 Properties of video (e.g., limitations, formats, extraction of still images).

90 5.4 The user should be familiar with the proper handling of media, write protection of
91 that media, and generating working copies.

92 5.5 The user shall understand the principles of comparison. These principles
93 include:

94 5.5.1 Process of Analysis, Comparison, Evaluation and Verification (ACE-V).

95 5.5.2 Assessment of facial image quality to determine the value for comparison
96 based on visibility of facial features.

97 5.5.3 The differences between class and individual characteristics.

98 5.5.4 Methods of Facial Comparisons

99 5.5.5 Morphological Analysis (the FISWG-recommended technique).

100 5.5.6 Superimposition (a technique which is only recommended by FISWG when
101 used in conjunction with morphological analysis).

102 5.5.7 Photo-anthropometry and its limitations (a technique which is not
103 recommended by FISWG for facial review).

104 5.5.8 Conclusion scale and levels of support relevant to facial review (e.g.,
105 exclusion, investigative lead)

106 5.5.9 Familiarity with scientific research related to the validity of facial comparison
107 methods, including strengths and limitations of any empirical studies that have been
108 conducted to test the accuracy of those methods.

109 5.5.10 Overview and effects of cognitive bias, to include confirmation bias.

110 5.6 The user should have a general knowledge of automated facial recognition
111 systems, to include, but not limited to:

112 5.6.1 User input and operation.

113 5.6.2 System operation and output.

114 5.6.3 Facial recognition algorithm limitations including, but not limited to:

115 5.6.3.1 Imaging conditions (e.g., image quality, lighting, pose).

116 5.6.3.2 Obstructions and accessories (e.g., eyeglasses, jewelry, masks, scarves,
117 head coverings).

118 5.7 The user should be familiar with basic image processing operations (e.g.,
119 brightness and contrast adjustments, rotations, cropping).

120 5.8 The user shall have a basic knowledge of the FISWG Facial Image Comparison
121 Feature List for Morphological Analysis (see also, ASTM E3149-18 Standard Guide for
122 Facial Image Comparison Feature List for Morphological Analysis).

123 5.9 The user should be aware of the variable nature of the human face over time
124 and the physical stability of individual features as they relate to expression, time-related
125 changes, weight change, changes in health and intentional alteration.

126 5.10 The user should be prepared to testify. Basic training for court testimony,
127 including knowledge of individual agency policies and procedures is beyond the scope
128 of this document and is the responsibility of the user's agency. However, users should
129 be aware of the following:

130 5.10.1 Their agency's authorities and policies regarding acceptable use and
131 dissemination.

132 5.10.2 The response(s) of the legal system to the admission and use of facial
133 recognition and identification and the perception(s) of the public to facial recognition and
134 identification (e.g., "The CSI Effect").

135 5.10.3 Proper chain of custody, documentation, and notes, reporting of results, and
136 technical review.

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