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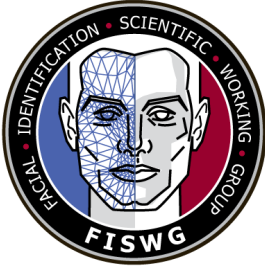


Image Processing Techniques for Facial Image Comparison

25 1. Scope

26 1.1 This document outlines guidelines and recommendations for image processing
27 techniques to be used with analysis and comparison of facial images.

28 1.2 This document does not discuss image processing techniques for running an
29 automated facial recognition search.

30 1.3 This document does not include all image processing techniques available or
31 discuss details of how to use the processing techniques.

32 2. Referenced Documents

33 2.1 *ASTM Standards:*¹

34 ASTM E2825 Standard Guide for Forensic Digital Image Processing

35 2.2 *FISWG Standards:*²

36 FISWG Guide for Facial Comparison Training of Reviewers to Competency

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.

² Available from Facial Identification Scientific Working Group, <https://fiswg.org>.

37 FISWG Guide for Facial Comparison Training of Examiners to Competency

38 **3. Terminology**

39 3.1 *Definitions:*

40 3.1.1 *lossless compression*—a data reduction process that is completely reversible,
41 such that all the original data can be retrieved in the original form.

42 3.1.2 *Working copy*—a copy or duplicate of a recording or data that can be used for
43 subsequent processing and/or analysis.

44 **4. Recommended Guidelines**

45 4.1 These guidelines should be used as a reference by practitioners of all levels
46 and experience/training

47 4.2 The practitioner should have the knowledge and understanding of image
48 processing as outlined in the FISWG Guide for Facial Comparison Training of
49 Reviewers, the FISWG Guide for Facial Comparison Training of Examiners, and the
50 ASTM E2825 Standard Guide for Forensic Digital Image Processing and should only be
51 performed if deemed useful to the subsequent comparison.

52 4.3 It is imperative to preserve the original image and image processing shall only
53 be done on a working copy.

54 4.4 The practitioner should use the minimum amount of image processing to
55 compare the images. They should be mindful if using image processing techniques as

56 they can introduce artifacts to the imagery or eliminate/alter facial characteristics.

57 4.5 All image processing techniques shall be made over the whole image and not in
58 localized areas.

59 **5. Image Processing Techniques**

60 5.1 The below example techniques can be used with image processing tools and
61 may differ based on agency guidelines:

62 5.1.1 Brightness/contrast

63 5.1.2 Cropping

64 5.1.3 Rotation

65 5.1.4 Color balance

66 5.1.5 Levels

67 5.1.6 Curves

68 5.1.7 Grayscale/Extract channel

69 5.1.8 Mirroring/Flipping

70 **6. Proper Documentation**

71 6.1 The practitioner shall document image processing steps taken, the software
72 used, and the software version with justification, if applicable per agency guidelines.

73 6.2 The image processing steps must be reproducible.

74 6.3 The image should be saved in a lossless compression format.

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