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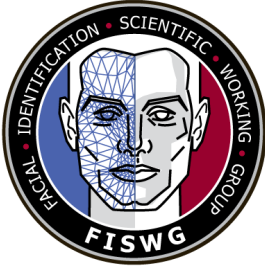
Image Processing Techniques for Facial Image Comparison

1. Scope

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

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

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

2. Referenced Documents

2.1 *ASTM Standards:* [1]

ASTM E2825 Standard Guide for Forensic Digital Image Processing

2.2 *FISWG Standards:* [2]

FISWG Guide for Facial Comparison Training of Reviewers to Competency

FISWG Guide for Facial Comparison Training of Examiners to Competency

3. Terminology

3.1 *Definitions:*

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

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[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@asstm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.
[2] For referenced FISWG documents, visit www.fiswg.org.

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3.1.2 *working copy*–a copy or duplicate of a recording or data that can be used for subsequent processing and/or analysis.

4. Recommended Guidelines

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

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

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

4.4 The practitioner should use the minimum amount of image processing to compare the images. They should be mindful if using image processing techniques as they can introduce artifacts to the imagery or eliminate/alter facial characteristics.

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

5. Image Processing Techniques

5.1 Image processing involves a change to image information. Examples of image processing techniques used with image processing tools are listed below. The use of these may differ based on agency guidelines.

5.1.1 Brightness/Contrast

5.1.2 Cropping

5.1.3 Rotation

5.1.4 Color balance

5.1.5 Levels

5.1.6 Curves

5.1.7 Grayscale/Extract channel

5.1.8 Mirroring/Flipping

6. Proper Documentation

6.1 The practitioner shall document all image processing steps taken, the software used, and the software version as per agency guidelines.

6.2 The image processing steps must be reproducible.

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

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