



Standard Guide for Capturing Facial Images for Use with Facial Recognition Systems¹

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1. Scope

1.1 This guide is intended for use by practitioners who are choosing, setting up, and operating photographic equipment designed to capture facial images for use with an automated Facial Recognition System or used for manual comparisons by a trained facial examiner. This guide provides an overview of how to achieve the specifications defined in Annex E of ANSI/NIST-ITL-1-2011, Update 2015, for capturing facial images.

1.2 Annex E of ANSI/NIST-ITL-1-2011 defines a well-controlled capture environment and subject whereas this document will give guidance where tight controls in the capture environment and subject control cannot be achieved.

1.3 This guide addresses equipment considerations for two-dimensional (2D) conventional images. It does not address video, scanners, or three-dimensional (3D) capture.

1.4 The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversions to non-SI units that are provided for information only and are not considered standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This guide is under the jurisdiction of ASTM Committee E30 on Forensic Sciences and is the direct responsibility of Subcommittee E30.12 on Digital and Multimedia Evidence.

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2. Referenced Documents

2.1 *ASTM Standards:*²

E2916 *Terminology for Digital and Multimedia Evidence Examination*

2.2 *Other Biometric Standards:*

ANSI/NIST-ITL-1-2011, Update 2015 *Data Format for the Interchange of Fingerprint, Facial and Other Biometric Information*³

NIST Special Publication 500-280v2 *Mobile ID Device Best Practice Recommendation, Version 2.0*³

3. Terminology

3.1 *Definitions:*

3.1.1 For terms relating to digital and multimedia evidence, refer to Terminology E2916.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *fish eye effect, n*—a type of distortion, where central objects of the image erroneously appear closer than those at the edge typically resulting in what appear to be unusually large noses in the image.

3.3 *Acronyms:*

3.3.1 2D—two-dimensional

3.3.2 FR—facial recognition

4. Significance and Use

4.1 The key factors that determine image quality for highly controlled facial images (for example: passports, police mugshots, drive motor vehicle, etc.) are well understood with respect to their use in automated FR systems and are a critical factor which directly affects the searching accuracy of the FR system.

² 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.

³ Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 1070, Gaithersburg, MD 20899-1070, http://www.nist.gov.

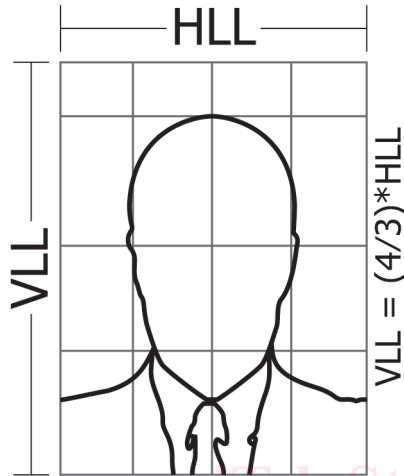
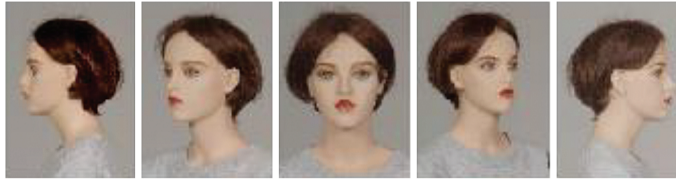


FIG. 2 Example Poses from a Controlled Acquisition Environment

5.2.2.5 Where available, multiple images should be captured to compensate for shortcomings in individual images.

5.3 *Uncontrolled Acquisition:*

5.3.1 This scenario refers to when neither the environment nor the subject can be controlled (for example, surveillance, hand held camera, body cameras, cell phones, etc.). It is characterized by high variations in quality and content and typically requires human review and specialized tools to identify and extract usable facial content. (See NIST Special Publication 500-280v2.)

5.3.2 In these situations, the person capturing the image should improvise to get the best image possible (see Fig. 3):

5.3.2.1 When appropriate, use a camera flash or additional lights source(s) to improve illumination,

5.3.2.2 Position the camera to get the best pose possible or provide a visual attractor to influence the pose,

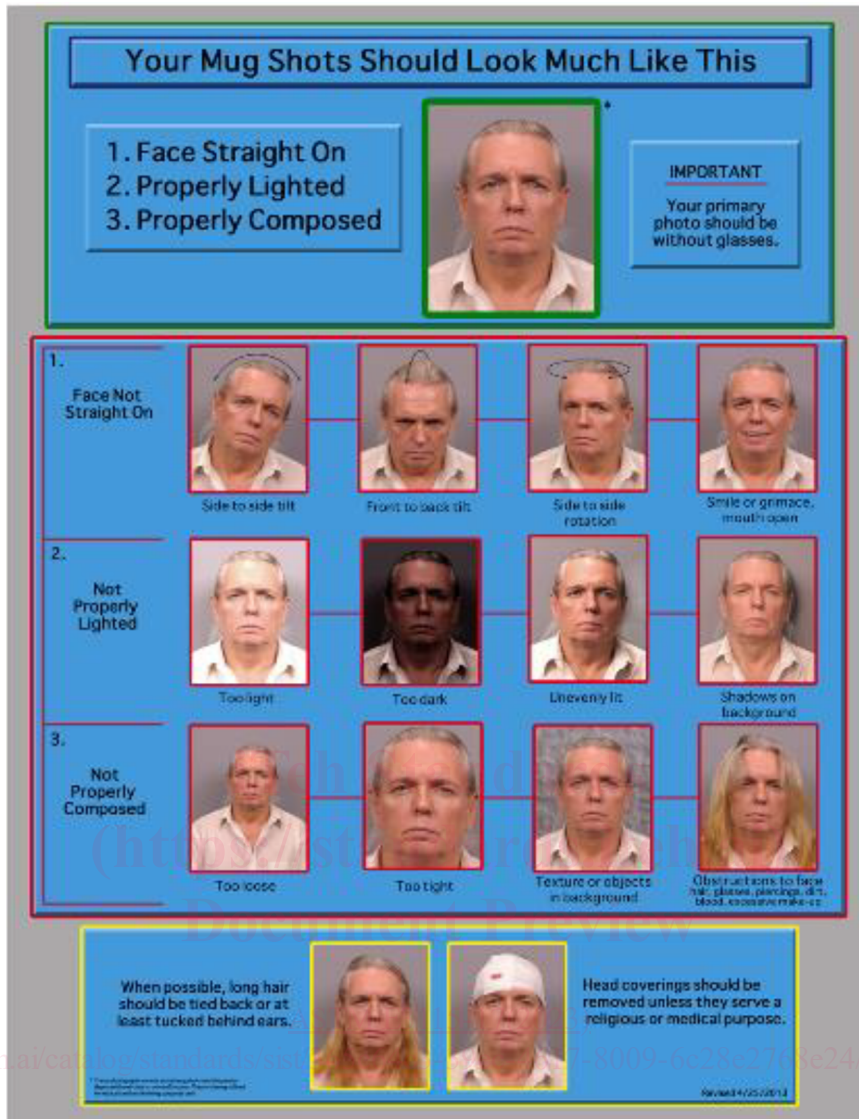
5.3.2.3 A single full frontal face with open eyes,

5.3.2.4 Elimination of convex lens distortion (subject should be more than 1 m (3 ft) from the camera), and

5.3.2.5 In these uncontrolled scenarios, multiple images should be captured to compensate for shortcomings in individual images.

6. **Keywords**

6.1 capture equipment; facial image; facial recognition



<https://standards.iteh.ai/catalog/standards/sis/8009-6c28-c27e24/astm-e3115-172023>

NOTE 1—Tennessee Bureau of Investigation, “Mug Shot Best Practices Guide,” available from [https://www.tn.gov/content/dam/tn/tbi/documents/Mug Shot Best Practices Poster.pdf](https://www.tn.gov/content/dam/tn/tbi/documents/MugShotBestPracticesPoster.pdf).

FIG. 3 Examples of Improper Poses from a Controlled Acquisition Environment