Training Guidelines for Video Analysis, Image Analysis and Photography

Video/Imaging Technology & Analysis Subcommittee
Digital/Multimedia Scientific Area Committee
Organization of Scientific Area Committees (OSAC) for Forensic Science
Disclaimer:

This document has been developed by the Video/Imaging Technology & Analysis Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science through a consensus process and is proposed for further development through a Standard Developing Organization (SDO). This document is being made available so that the forensic science community and interested parties can consider the recommendations of the OSAC pertaining to applicable forensic science practices. The document was developed with input from experts in a broad array of forensic science disciplines as well as scientific research, measurement science, statistics, law, and policy.

This document has not been published by an SDO. Its contents are subject to change during the standards development process. All interested groups or individuals are strongly encouraged to submit comments on this proposed document during the open comment period administered by ASTM International (www.astm.org).
Ballot Rationale: This document provides training guidelines and recommendations to assist organizations in designing a training program for forensic video analysts, image analysts, and photographers to ensure competency in the completion of forensic tasks and analyses.

Training Guidelines for Video Analysis, Image Analysis and Photography.

This standard is issued under the fixed designation X XXXX; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Purpose

1.1. The purpose of this document is to provide guidelines and recommendations to assist organizations in designing a training program for forensic video analysts, image analysts, and photographers to ensure competency in the completion of forensic tasks and analyses.

2. Scope

2.1. This document will recommend topics and guidelines for training within the disciplines of video analysis, image analysis, and photography as a supplement to the "Standard Practice for Forensic Scientist Practitioner Training, Continuing Education and Professional Development Programs".

3. Referenced Document


4. Terminology
4.1. **Video Analysis**, the scientific examination, comparison, or evaluation of video in legal matters.¹

4.2. **Image Analysis**, the application of image science and domain expertise to examine and interpret the content of an image, the image itself, or both in legal matters.²

4.3. **Photography**, the mix of art and science for the capture of images on a light sensitive surface³.

4.4. **Competency**, Possessing and demonstrating the requisite knowledge, skills and abilities to successfully perform a specific task.⁴

4.5. **Proficiency**, the ongoing demonstration of competency.⁵

5. **Limitations**

5.1. Some organizations may include additional topics of training beyond what is recommended in this document. Regardless of the exact training topics selected, the program should demonstrate and document that the training selected is adequate to ensure competency for the specific tasks being undertaken by the trainee.

5.2. Training topics introduced in this document may not fit the needs of individual organizations, when job-specific duties are limited to a subset of those listed. Each organization should determine the minimum training guidelines for examinations performed.

5.3. Training can quickly become obsolete, and continuing education is needed to maintain proficiency.

5.4. Additional training may be needed for new technologies and procedures that are not included in this document.

6. **Job Categories**

6.1. Organizations may choose to use different titles, but the typical responsibilities are defined below. Differentiation between job categories is based on the degree to which personnel are involved in the collection and examination process. However, since job categories frequently overlap, training programs should be specific to the tasks performed.

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¹ ASTM E2916-13, 2013.
² SWGDE Training Guidelines for Video Analysis, Image Analysis and Photography Version: 1.1
³ SWGDE Training Guidelines for Video Analysis, Image Analysis and Photography Version: 1.1
⁴ SWGFAST Document 19.
⁵ SWGFAST Document 19.
performed by the individual, and may contain topics related to several of the following job categories.

6.1.1. First Responder includes personnel who are the first to secure, preserve, or collect video, image, and photographic evidence at a crime scene. These personnel often have general crime-scene evidence collection responsibilities.

6.1.2. Field Photographer/Videographer includes personnel who document and preserve conditions and evidence through photography or videography, primarily, but not exclusively, outside the laboratory.

6.1.3. Technician includes personnel whose primary responsibility is to collect or prepare video, image, and photographic evidence for examination and analysis.

6.1.4. Laboratory Photographer includes personnel whose primary responsibility is to document and preserve evidence through photography within the laboratory.

6.1.5. Examiner/Analyst includes personnel for whom examination, analysis, or recovery of video, image, and photographic evidence is a major component of their routine duties.

7. Training Topics According to Job Category

7.1. First Responder

7.1.1. Technical Foundations

7.1.1.1. Video formats, standards and file identification

7.1.1.2. Basic photography concepts

7.1.2. Equipment

7.1.2.1. Recording and playback devices

7.1.2.2. Monitors and other output devices

7.1.2.3. Media types

7.1.2.4. Digital camera

7.1.3. Techniques

7.1.3.1. Basic crime scene photography

7.1.3.2. Video data recovery

7.1.3.3. Evidence handling and packaging

7.1.4. Legal Foundations
7.1.4.1. Specific legal requirements to include admissibility issues, discovery and an overview of the criminal justice system.

7.1.4.2. Courtroom testimony

7.2. Field Photographer

7.2.1. Technical Foundations

7.2.1.2. Principals of Photography, including lighting, exposure, file formats and compression, and composition of images.

7.2.1.3. Procedures for recording quality images in various situations

7.2.1.4. Image handling and integrity

7.2.2. Equipment

7.2.2.1. Camera suitable for job function

7.2.2.2. Lighting sources

7.2.2.3. Ancillary equipment and accessories (tripods, removable media, scales, etc.)

7.2.2.4. Software/applications

7.2.3. Techniques

7.2.3.1. Various lighting techniques to include alternate light sources (ALS)

7.2.3.2. Macro Photography

7.2.3.3. Comparative photography (ie. Latent prints, impressions

7.2.3.4. General crime scene documentation

7.2.3.5. Subject (person) photography

7.2.3.6. Specialized photography (e.g., trajectory, aerial photography, panoramic photography, blood stain patterns, and techniques related to other forensic disciplines)

7.2.3.7. Evidence handling and packaging

7.2.4. Legal Foundations

7.2.4.1. Topics included in 7.1.4

7.3. Laboratory Photographer

7.3.2. Technical Foundations

7.3.2.1. Topics included in 7.2.1

7.3.2.2. Microscopy
7.3.2.3. Macro-photography
7.3.2.4. Scanner image capture

7.3.3. Equipment
7.3.3.1. Topics included in 7.2.2
7.3.3.2. Copy stands
7.3.3.3. Microscopes
7.3.3.4. Scanners

7.3.4. Techniques
7.3.4.1. Topics included in 7.2.3
7.3.4.2. Photomicrography
7.3.4.3. Other imaging technologies

7.3.5. Legal Foundations
7.3.5.1. Topics included in 7.1.4

7.4. Video Technician
7.4.2. Technical Foundations
7.4.2.1. Topics included in 7.1.1
7.4.2.2. Principles of analog video recording
7.4.2.3. Compression artifacts
7.4.2.4. Analog video security system concepts
7.4.2.5. Basic audio principles

7.4.3. Equipment
7.4.3.1. Topics included in 7.1.2
7.4.3.2. Hardware for duplication, conversion and optimization
7.4.3.3. Software for duplication, conversion and processing
7.4.3.4. Video signal measuring devices

7.4.4. Techniques
7.4.4.1. Topics included in 7.1.3
7.4.4.2. Playback optimization
7.4.4.3. Video processing techniques
7.4.4.4. Image processing techniques

7.4.5. Legal Foundations
7.4.5.1. Topics included in 7.1.4

7.5. Video Analyst

7.5.2. Technical Foundations

7.5.2.1. Topics included in 7.4.1

7.5.2.2. Broadcast theory and history

7.5.2.3. Basic digital theory

7.5.2.4. Imaging science

7.5.2.5. Frequency fundamentals

7.5.2.6. Video signal standards

7.5.2.7. Video editing

7.5.2.8. Human factors relating to forming conclusions in analysis (e.g., bias)

7.5.3. Equipment

7.5.3.1. Topics included in 7.4.2

7.5.3.2. Hardware for calibration and maintenance

7.5.4. Techniques

7.5.4.1. Topics included in 7.4.3

7.5.4.2. Video editing

7.5.4.3. Advanced video enhancement techniques

7.5.4.4. Advanced image enhancement techniques

7.5.4.5. Signal analysis

7.5.4.6. Video media reconstruction

7.5.4.7. Content authenticity

7.5.4.8. Source authenticity

7.5.5. Legal Foundations

7.5.5.1. Topics included in 7.1.4

7.5.5.2. Moot court exercises, including admissibility issues (e.g., Daubert v. Merrell Dow Pharmaceuticals (1993), Frye v. United States (1923), Federal Rules of Evidence (Rules 701-706), etc.)

7.5.5.3. Testimony monitoring

7.6. Image Technician
7.6.1. Technical Foundations

7.6.1.1. Principles of video recording
7.6.1.2. Principles of traditional and digital photography
7.6.1.3. Principles of digital media, file identification, and recovery
7.6.1.4. Image types and formats
7.6.1.5. Compression artifacts

7.6.2. Equipment

7.6.2.1. Recording and playback devices
7.6.2.2. Monitors and other output devices
7.6.2.3. Media types
7.6.2.4. Hardware for duplication, conversion and optimization
7.6.2.5. Software for duplication, conversion and processing

7.6.3. Techniques

7.6.3.1. Video processing techniques
7.6.3.2. Image processing techniques
7.6.3.3. Evidence handling and packaging

7.6.4. Legal Foundations

7.6.4.1. Those topics included in 7.1.4

7.7. Image Analyst

7.7.1. Technical and Scientific Foundations

7.7.1.1. Topics included in 7.6.1
7.7.1.2. Image science and technology
7.7.1.3. Image comparison theory
7.7.1.4. Optics
7.7.1.5. Photogrammetry theory
7.7.1.6. Data integrity and imaging artifacts
7.7.1.7. Specific domain knowledge for content analysis and comparison
7.7.1.8. Statistics
7.7.1.9. Human factors relating to forming conclusions in analysis (e.g., bias)

7.7.2. Equipment
7.7.2.1. Topics included in 7.6.2
7.7.2.2. Capture, input and output devices
7.7.2.3. Digital storage devices and media
7.7.2.4. Software, including
   7.7.2.4.1. File identification
   7.7.2.4.2. Diagnostics
   7.7.2.4.3. Calibration
   7.7.2.4.4. Restoration of corrupted files
   7.7.2.4.5. Analysis
   7.7.2.4.6. Metadata determination

7.7.3. Techniques
   7.7.3.1. Topics included in 7.6.3
   7.7.3.2. Photogrammetry
   7.7.3.3. Comparison
   7.7.3.4. Content authentication
   7.7.3.5. Source authentication
   7.7.3.6. Advanced video enhancement techniques
   7.7.3.7. Advanced image enhancement techniques

7.7.4. Legal Foundations
   7.7.4.1. Topics included in 7.5.4
8. Keywords

8.1. digital multimedia analysis
8.2. forensic video analysis
8.3. forensic photography
8.4. baseline education
8.5. categories of training
8.6. competency
8.7. education
8.8. image analysis
8.38. professional development
8.39. proficiency
8.40. training
## 9. History

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