DMSAC Subcommittees

Facial Identification
Speaker Recognition
Video/Imaging Technology & Analysis
Digital Evidence
Digital/Multimedia SAC Leadership

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Lam Nguyen, Vice Chair, Mandiant

Douglas Lacey, Executive Secretary, BEK TEK LLC

Julie Carnes, Chair, Video/Imaging Technology and Analysis, Target

John Duckworth, Chair, Digital Evidence, U.S. Postal Service Office of Inspector General

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</table>
DMSAC & OSAC Focus and Key Challenges

Scientific Paradigm for DMS Accreditation
Conclusion Scales
Terminology
Error Rates
DMSAC & OSAC Focus and Key Challenges
Scientific Paradigm for DMS – Task Group

A Framework for Harmonizing Forensic Science Practices and Digital/Multimedia Evidence

OSAC Task Group on Digital/Multimedia Science
DMSAC & OSAC Focus and Key Challenges

Accreditation Issues
DMSAC & OSAC Focus and Key Challenges

Conclusion Scales
Terminology

Working OSAC Task Groups addressing these issues.
DMSAC & OSAC Focus and Key Challenges

Error Rates
- Defining Areas for Further Study (e.g., Vehicle Make/Model)
- Promoting Existing Peer-Reviewed Research

Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms

PNAS June 12, 2018 115(24):E671-E676; first published May 29, 2018 https://doi.org/10.1073/pnas.1721551115
Edited by Thomas O. Albright, The Salk Institute for Biological Studies, La Jolla, CA, and approved April 30, 2018 (received for review December 13, 2017)
Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms


PNAS June 12, 2016 113 (24) 6171-6176; first published May 29, 2016 https://doi.org/10.1073/pnas.1521551115

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Edited by Thomas D. Allbritton, The Salk Institute for Biological Studies, La Jolla, CA, and approved April 30, 2018 (received for review December 13, 2017)

Diagram:

Examiners:

Reviewers:

Super-recognizers:

Fingerprint:

Students:

Group:

Type of error: ▲ +3 on different faces ● −3 on same faces

Estimate of error rate

0.00 0.05 0.10 0.15
**DMSAC Current Activities - Highlights**

Road Maps - What standards are being worked? (*DE Example)

Process Maps – Provides pointers for what standards should be established. (*SR Example)

Different Processes Require Different Kinds of Standard (i.e., not all standards are the same, nor can they all be judged using the same metrics.)
DMSAC “Generic” Process Map

Authorization received? Yes No

Survey/Evidence Collection Preservation

Possible to re-collect evidence? Yes No

Technical assessment/evidence fit for purpose?

Request authorization

Examination/Analysis

Obtain or identify reference data, as needed

Evaluation/Integration

Interpretation/Conclusions

Findings/Report/Work Product

Verification/Review

Is there concurrence? Yes No

Quality Management System
Facial Identification

Speaker Recognition

Video/Imaging Technology & Analysis

Digital Evidence

DMSAC Subcommittees

Facial Identification

Speaker Recognition

Video/Imaging Technology & Analysis

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Facial Identification


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, Guidelines and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

**Designation: E3149 – 18**

Standard Guide for Facial Image Comparison Feature List for Morphological Analysis

This standard is issued under the fixed designation E3149; 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. Scope
   1.1 This guide defines a set of facial components, characteristics, and descriptors to be considered during a morphological facial comparison (see FISWG Best Practices for Facial Image Comparison Feature List for Morphological Analysis).
   1.2 This set of facial components, characteristics, and descriptors describes the facial features that may be visible and comparable between images.
   1.3 This guide defines a standard set of facial components.

3. Terminology
   3.1 Definitions:
   3.1.1 characteristic descriptors, n—minutiae of the component characteristics.
   3.1.2 component characteristics, n—detailed features of the facial components.
   3.1.3 facial components, n—gross features considered in virtually all comparisons.

4. Significance and Use
Facial Identification

- ASTM E3148-18 Guidelines for Postmortem Facial Image Capture
- ASTM E3115-18 Guidelines for Capture and Equipment Assessment for Face Recognition Systems
Facial Identification

• GUIDE FOR ROLE BASED TRAINING IN FACIAL COMPARISON
Standards in Process – Under Development

Facial Identification

• Guide for Facial Comparison Training to Competency
• Standard Guide for Training, Continuing Education & Professional Development
• Impact of Printing Effects on Facial Comparison
• Collection Standards for Subjects in Headwear
Facial Identification

• Assessment of Accuracy of Facial Images from DNA
• Evaluation of Validity of Facial Comparison Training Methods
• Human Factors in Facial Comparison
• Post Capture Image Processing
• Establishing Physical Stability of Facial Features in Adults
DMSAC
Speaker
Recognition
Leadership

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Kenneth Marr, Federal Bureau of Investigation (retired)
Oscar Morales, U. S. Department of Defense

Christopher Cieri, Ph.D., Linguistic Data Consortium
Omid Sadjadi, Ph.D., National Institute of Standards and Technology
Alice Thomas, U. S. Secret Service
Pedro Torres-Carrasquillo, Ph.D., MIT Lincoln Laboratory
Speaker Recognition

• Guidelines for Electronic Transmission of Speech Files
• Guidelines for Collection of Audio at a Temporary Location
Technical Publications in Process

Speaker Recognition

- Foundational scientific literature for forensic speaker recognition
- Vocabulary Terms for Speaker Recognition
- Process Map*
- Best Practices for Forensic Human-Supervised Automatic Speaker Recognition: Pre-Processing and Relevant Population Data Selection
4200 - Human Supervised Automatic Analysis

4205 Is additional analysis needed?

4210 Describe speakers in recording

4213 Optimize the selection

4219 Create new Tfs containing one speaker per recording

4223 How is separation of speakers of interests? (data sufficiency)

4227 Can I continue with the analysis?

4230 Conduct expert witness testing (set expectations and parameter selection)

4235 Use results to determine model,test data

4237 Model selection, overfitting, performance issues

4240 Train model using training data

4245 Test system using development data

4248 Evaluate performance

4250 Evaluate performance

4255 Is there a need to optimize the system?

4260 Make changes to system

4265 Adjust model, reference population and/or settings

4270 Document issues noted in step 4265

4275 Report that system performance under the case condition is adequate to proceed with an evaluation of the strength of evidence associated with the known and questioned speaker recordings

4279 Report only results that support likelihood ratio

4280 Report results

4285 Complete record (supervised automatic method) and data on new or updated ASRs

4287 Document issues noted in step 4265

4290 Complete record (supervised automatic method) and data on new or updated ASRs

4295 Report results

4299 Complete record (supervised automatic method) and data on new or updated ASRs

4300 Return to overview

Commentary

This document is a work product of the OSAC Speaker Recognition Subcommittee. Distribution is authorized only to OSAC members and affiliates until the document is approved for public release.
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Daren Ford, Weld County (Colorado) Sheriff's Office
David Hallimore, Recorded Evidence Solutions, LLC
James Holland, Wal-Mart Stores, Inc.
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Paul Reedy, District of Columbia Department of Forensic Sciences
Marcus Rogers, Ph.D., Purdue University
Brian Russell, U.S. Fish & Wildlife Service
David Shaver, U.S. Army
Steve Watson, VTO Labs
Digital Evidence Roadmap

Training and Tailoring
- NIST Special Publication 1800-13
- NIST Special Publication 1800-14
- U.S. Department of Justice, Bureau of Justice Statistics, Training and Technical Assistance

Presentation, Collection and Acquisition
- SAS70:2002
- HIPAA
- SOX
- PCI DSS
- GLBA
- FISMA
- GHOST
- FORETCOM
- CICS
- FEDRAMP
- NIST

Analysis
- NIST
- FBI
- NSA
- DNI
- OMB
- GAO
- OPM
- DHS

Quality Assurance
- NIST
- ISO
- ASIS
- ANSI
- ABA
- ACFE
- BCS
- CISA
- CISSP
- ITIL
- COBIT
- PCI DSS
- NIST

Documentation Reporting and Testimony
- NIST
- ISO
- IEC
- ASTM
- ACFE
- ABA
- BSA
- NIST
- ISO
- ACFE

Examination of Data from Digital Devices
- NIST
- ISO
- IEC
- ASTM
- ACFE
- ABA
- BSA
- NIST
- ISO
- ACFE

Early Warning System
- NIST
- ISO
- IEC
- ASTM
- ACFE
- ABA
- BSA
- NIST
- ISO
- ACFE

Light Blue
General Warning of Evidence
Green
OSAC standards or guidelines
Gray
Other criteria or guidance
Digital Evidence

• ASTM E2678-09(2014) Standard Guide for Education and Training in Computer Forensics (Revision of this existing standard)
• ASTM WK63926 Repair and Recovery of Damaged Audio Media
• ASTM WK66298 Forensic Audio Examination Workflow
• ASTM WK67924 Core Competencies for Forensic Audio
• *ASTM E3017-15 Standard Practice for Examining Magnetic Card Readers
Standards in Process – Under Development

Digital Evidence

- *Digital Evidence Testimony Preparation*
- *Quality Management System Framework*
- *Digital Evidence Tool Testing*
- *Standard Guide for Education and Training in Computer Forensics*
- *Forensic Report Writing (SWGDE)*
- *Preservation of Evidence from Mobile Devices*
Digital Evidence:
- Scientific Analysis of Hash Authentications
- Mobile Application Triage Tool
- De-Duplication of Digital Forensics Artifacts from Disparate Sources or Tools
- Internet of Things, User Artifacts
- Digital Forensics Tool to Support Virtual Machines and Virtual File Systems
DMSAC
Video/Imaging Technology & Analysis Leadership

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John Twomey, U.S. Secret Service
Jesus R. Valenzuela, Seattle Police Department
Robert Young, City of Mesa (Arizona) Police Department
Video / Imaging Technology and Analysis (VITAL)
**This standard is under review for placement on the OSAC Registry.**
VITAL Standards at ASTM

- Standard Training Guidelines for Video Analysis, Image Analysis, and Photography (WK66417)
- Standard Guide for Latent Print Evidence Imaging Resolution (WK66357)
- Standard Practice for Data Retrieval from Digital CCTV Systems (WK61709)
Standards in Process – Under Development

VITAL – Under Development
• Standard Guide for Content and Source Authentication
• Standard Guide for Forensic Photogrammetry
• Standard Guide for Forensic Digital Video Analysis
• Standard Guide for Crime Scene Photography
VITAL – Research Needs

- Determination of the Size of the Smallest Detail Required for Tire and or Shoe Comparisons
- Factors Affecting Image Quality When Extracting a Still from Video
- Software Validation Repository
- Vehicle Comparison Study
Thank you

https://www.nist.gov/topics/organization-scientific-area-committees-forensic-science