



Digital/Multimedia Scientific
Area Committee Update
OSAC Public Update Meeting
Richard W. Vorder Bruegge
September 29, 2021

DMSAC's Structure

DMSAC Vice Chair – William Trenkle, USDA

Digital Evidence SC Chair – Lam Nguyen, DC3
(Tracy Walraven, CFLDFS)*

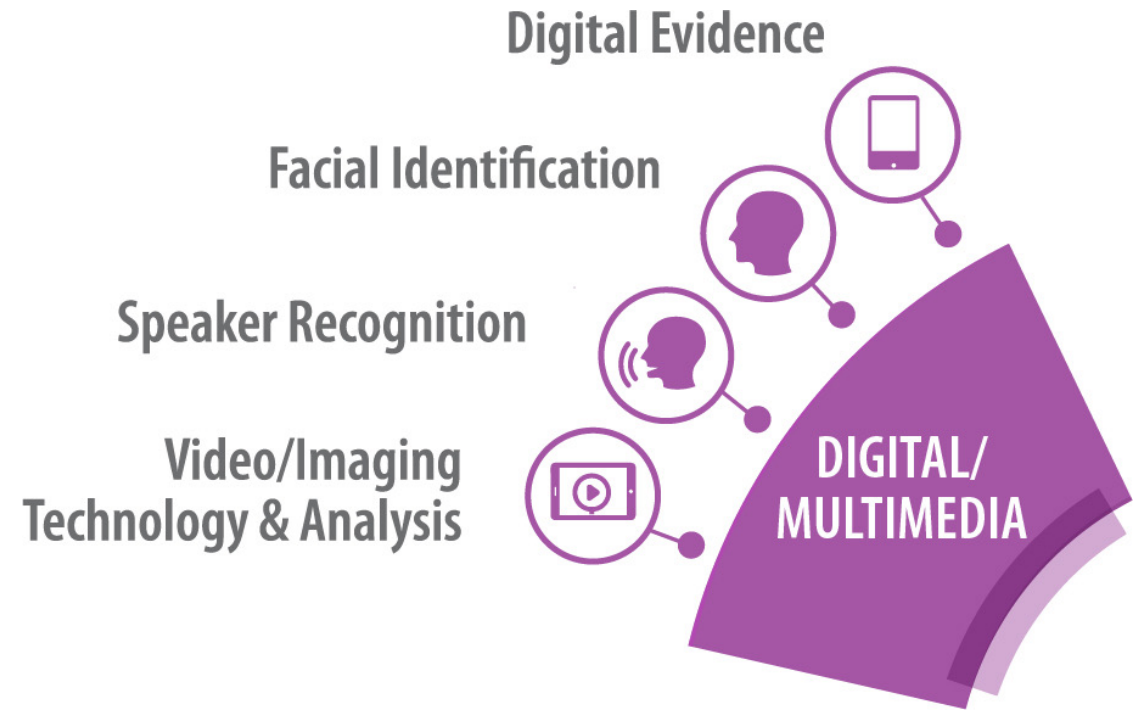
Facial Identification SC Chair – Lora Sims^, I3
(Jane Harris, MSP)*

Speaker Recognition SC Chair– David Marks, FBI

VITAL SC Chair – Julie Carnes, Target Corporation

* Incoming SC Chair as of October 1, 2021

^ Incoming SAC Chair as of October 1, 2021



OSAC Registry Standards



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standards

- **10** Biology/DNA (8 published & 2 OSAC Proposed)
- **1** Bloodstain Pattern Analysis
- **3** Digital Evidence
- **1** Dogs & Sensors
- **4** Facial Identification (3 published & 1 OSAC Proposed)
- **2** Fire & Explosion Investigation
- **6** Fire Debris Analysis
- **1** Firearms & Toolmarks
- **1** Footwear & Tire
- **4** Medicolegal Death Investigation (2 published & 2 OSAC Proposed)
- **2** Odontology
- **6** Seized Drugs
- **4** Toxicology
- **9** Trace Materials
- **5** Wildlife Forensics (4 published & 1 OSAC Proposed)
- **6** Interdisciplinary

<https://www.nist.gov/osac/osac-registry>



Digital Evidence Registry Standards

Digital Evidence

Published Standards

- [ASTM E2916-19e1 Standard Terminology for Digital and Multimedia Evidence Examination](#) (added July 7, 2020).
- [ASTM E3017-19 Standard Practice for Examining Magnetic Card Readers](#) (added July 7, 2020).
- [ASTM E3150-18 Standard Guide for Forensic Audio Lab Setup and Maintenance](#) (added July 7, 2020).



Facial Identification Registry Standards

Facial Identification

Published Standards

- [ASTM E3115-17 Standard Guide for Capturing Facial Images for Use with Facial Recognition Systems](#) (added October 1, 2019).
- [ASTM E3148-18 Standard Guide for Postmortem Facial Image Capture](#) (added October 1, 2019).
- [ASTM E3149-18 Standard Guide for Facial Image Comparison Feature List for Morphological Analysis](#) (added February 14, 2019).

OSAC Proposed Standards

- [OSAC 2020-S-0002, Physical Stability of Facial Features of Adults](#) (added June 1, 2021 and sent to ASTM for further development and publication).
 - NOTE: This is an annex to the published standard, *ASTM E3149-18 Standard Guide for Facial Image Comparison Feature List for Morphological Analysis*, listed above.



2 DMSAC Standards Open For Comment

OSAC PROPOSED STANDARDS OPEN FOR COMMENT

The following draft OSAC Proposed Standards are being considered for submission to an SDO. The final draft provided to the SDO will be available on the [OSAC Registry](#) as an “OSAC Proposed Standard.” OSAC welcomes comments on whether the current draft is suitable for release to the SDO as well as suggestions for improvements in content and wording. **To be considered, comments must be placed in the [OSAC Comment Form](#) and sent to comments@nist.gov by 11:59 p.m. ET on October 4, 2021.**

- [OSAC 2021-S-0013, *Standard Guide for Post Mortem Photography*](#).
 - [OSAC 2021-S-0013 STRP Report | Task group response to STRP report](#)
- [OSAC 2021-N-0030, *Terminology for a Suspected Pattern of Dental Origin*](#).
- [OSAC 2021-N-0035, *Standard Guide for Scanning Facial Images for Manual Comparison*](#).
- [OSAC 2021-N-0039, *Standard for a Mentorship Program in Bloodstain Pattern Analysis*](#).

NOTE: OSAC RESOURCE TASK GROUP MEMBERS ARE ENCOURAGED TO COMMENT ON THESE STANDARDS BY DOWNLOADING THE RTG COMMENT TABLE FOUND ON THE INTERNAL WEBSITE AND SUBMITTING IT TO FORENSICS@NIST.GOV IN ACCORDANCE WITH THE REGISTRY APPROVAL PROCESS.

Comments submitted, including the commenter's name and/or affiliation, will be made available to the public.

<https://www.nist.gov/osac/standards-open-comment>



Digital Evidence Highlights

Documents sent to an SDO (ASTM):

Standard Guide for Education and Training in Computer Forensics.

Core Competencies for Forensic Audio

Document Proposed for Registry:

Minimum Requirements for Tool Testing used in Digital and Multimedia Forensics



Digital Evidence Highlights

Additional documents in process within the DE Subcommittee:

Best Practices for Mobile Device Evidence Collection and Preservation, Handling, and Acquisition

Best Practices for Archiving Digital and Multimedia Evidence

Best Practices for Mobile Device Analysis

Technical Note on Internet of Things (IoT) Devices



Digital Evidence Highlights

Quality Management in Digital Evidence Examination Project

- This project interviews senior laboratory personnel and “customers’ of digital forensics to include prosecutors and judges to examine which elements of a quality management system are most valued inside and outside the laboratory.
- Results will direct the DE SC in creating guidance and standards documents for the OSAC registry.

Key Accomplishments to Date:

- IRB approval received for the project.
- Completed approximately 20 interviews to date.



Digital Evidence

Research & Development Needs

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](#)



Two standards sent to SDO (ASTM)

Standard Practice/Guide for Image Processing to Improve Automated Facial Recognition Search Performance

Standard Guide for Developing Discipline Specific Methodology by ACE-V (interdisciplinary document)

One standard completed STRP process and will be sent to SDO

Physical Stability of Facial Features of Adults
(On Registry as Proposed OSAC Standard)



Two standards sent to SDO but will be coming back through the OSAC 2.0 process (STRP/Non-STRP).

Guide for Role Based Training in Facial Comparison

Standard Guide for Image Based Comparison Conclusions (Partnership with VITAL)

One FI drafted standard is now available for open comment (through October 4, 2021).

Standard Guide for Scanning Facial Images for Manual Comparison

Three additional drafted standards have been submitted for STRP/non-STRP reviews to start

Standard Guide for Facial Comparison Overview and Methodology Guidelines

Standard Guide for Minimum Facial Image Comparison Documentation

Standard Guide for Printing Method Effects on Facial Comparisons



Additional documents in process within the FI Subcommittee include:

Managing Head Coverings, Accessories, and Make-up (HCAM) for Booking Photographs

Minimum Training Criteria When Using Facial Recognition Systems

Guide for Facial Comparison Awareness Training of Assessors

Guide for Facial Comparison Training of Reviewers to Competency

Guide for Facial Comparison Training of Examiners to Competency

Guide for Mentorship of Facial Comparison Trainees in Role Based Facial Comparison

Image Factors to Consider in Facial Comparison

ACE-V document specific to Facial Identification



Facial Identification

Highlights

Additional non-standard documents within FI Subcommittee include:

Technical Guide on EBTS use with Facial Identification/Application Profiles (*approved for posting to FI Sub website*)

Technical Guide on Live FR use (*in draft*)



Facial Identification

Research & Development Needs

Facial Identification

- Human Factors in Facial Image Comparison
- Proper Monitor Selection and Setup for Forensic Image Examinations
- Validation of the "Physical Stability of Facial Features of Adults" Document



Speaker Recognition Highlights

Standard Sent to SDO (Audio Engineering Society SC-03-12)

Audio Collection at a Temporary Location (Standard)

Standards in Development

Validation of Forensic Speaker Recognition for the Purpose of Informing Legal Admissibility Decisions

Best Practices for Forensic Human-Supervised Automatic Speaker Recognition: Pre-Processing and Relevant Population Data Selection



Speaker Recognition Highlights

Other Work Products

Discipline-Specific Bibliographies and Bibliographic References

These documents may contain information to help forensic scientists, judges, lawyers, researchers, and other readers better understand the nature, scope, and foundations of the individual disciplines as currently practiced. The identification of these documents does not represent an endorsement by OSAC or NIST. Only standards that are posted on the OSAC Registry and Technical Guidance documents, are endorsed by OSAC. The referenced documents may be subject to copyright. **Note:** Subcommittee position statements or responses to data collections by the subcommittee do not necessarily represent the position of OSAC or NIST.

- [Essential Scientific Literature for Human-Supervised Automatic Approaches to Forensic Speaker Recognition.](#)

Process Maps

- [Speaker Recognition Process Map - Current Practices.](#)

Research & Development Needs

- See the [research and development needs](#) identified by the Speaker Recognition Subcommittee.



Speaker Recognition Highlights



ORGANIZATION OF SCIENTIFIC AREA COMMITTEES (OSAC)
FOR FORENSIC SCIENCE

SPEAKER RECOGNITION SUBCOMMITTEE

Essential scientific literature for human-supervised automatic approaches to forensic speaker recognition

*Prepared by Scientific Literature Working Group,
Speaker Recognition Subcommittee*

1st edition

April 2021



PREFACE

This document provides a structured bibliography of essential scientific literature for human supervised automatic approaches to forensic speaker recognition. The bibliography complies with criteria for foundational scientific literature published by the US National Commission on Forensic Science. The scope of the document is restricted to forensic speaker recognition conducted for the purpose of presenting testimony in court, as opposed to conducted for purely investigative purposes.



Speaker Recognition Highlights

Other SR Work Products in Progress*

Overview/Landscape of Speaker Recognition (TechPub)

Taxonomy of Mismatch Conditions for Speaker Recognition (TechPub)

Legal Challenges in Speaker Recognition (TechPub or SR-internal document)

***Why so much “Other Work”?** Analogy to Forensic DNA in late 1980s?



Speaker Recognition Highlights

Research & Development Needs

Speaker Recognition

- Effect of Specific Data Variations on Forensic Speaker Recognition Results
- Standard Forensic Speaker Recognition Test Data
- Synthetic Speech Detection



Two standards were recently approved at ASTM and will soon begin the “legacy” registry approval process for published standards.

Standard Guide for Digital Image Processing

Standard Practice for Latent Print Evidence Imaging Resolution

One VITAL drafted standard was recently reviewed by a STRP and is now available for open comment (through October 4, 2021).

Standard Guide for Post Mortem Examination Photography



VITAL standards under review by a STRP. Open comment period has closed.

Standard Guide for Laboratory Photography

Standard Guide for Image Authentication

VITAL standard pending review by a STRP

Standard Guide for Forensic Photogrammetry



Additional VITAL standards in preparation.

Standard Guide for Forensic Video Analysis

Standard Guide on Process Based Quality Assurance Criteria for Digital and Multimedia Evidence

Standard Guide on Digital Video and Image Analysis Work Product

Standard Guide for Image Management

Standard Guide for Discipline Specific Needs

Standard Practice for Photographing Scars, Marks and Tattoos (Interdisciplinary)

Standard Guide for Multiple Camera 3D Models

Standard Guide for Content Analysis



Other VITAL work products in progress

Video/Image Analysis Process Map

Approved Software Validation Repository Survey (refer to R&D need)

Resource Map (documents inter-relationship of standards)

Synthetic Media Primer

Emerging Technology Awareness & Emerging Technology Terminology



Video/Imaging Technology & Analysis Research & Development Needs

Video/Imaging Technology & Analysis

- [Authentication of PDF Documents](#)
- [Detecting Deepfakes](#)
- [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 Black Box and White Box Study](#)
- [Vehicle Year, Make and Model Analysis Black Box and White Box Study](#)

THANK YOU!

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