FORENSIC DATA FOR FACE & IRIS

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ANSI/NIST-ITL 1-2011
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Emerging Questions for Forensics

- Many agencies utilizing Face Recognition (FR)
- Many Agencies interested in Facial Identification (FI)
- FISWG formed to address utilization of FR systems and perform FI
  - Includes Capture Practices
  - Several dozen agencies currently represented.

FISWG Organizations

- ARGIS
- Arkansas Crime Information Center
- Biometrics Identity Management Agency (DOD)
- Canada Border Services Agency
- DHS/US Border Patrol
- DHS/US Marshal's Service
- DHS/US Secret Service
- DHS/US TSA
- US-VISIT (DHS)
- FBI, CJIS
- FBI, OTD
- FBI, Charlotte Division
- Finland National Bureau of Investigation, Forensic Laboratory
- Florida Department of Law Enforcement
- Home Office Scientific Development Branch, UK
- IAI
- Illinois State Police Michigan State Police
- Metropolitan Police Service, London
- MITRE
- National Counterterrorism Center (NCTC/ODNI)
- National Institute for Justice (NIJ)
- National Institute for Standards & Technology (NIST)
- National Policing Improvement Agency, UK
- Netherlands Forensic Institute
- Nevada DMV (Public Safety)
- New York Police Department
- New York State DMV
- NOBLIS
- North Carolina DMV
- OK State Bureau of Investigation
- Pennsylvania DOT
- Pinellas County Sheriff's Office
- RCMP
- SC State Law Enforcement Division
- Texas DPS
- US DHS
- USACIL
- US Government
- University of North Carolina Wilmington
- University of Notre Dame
- WA State, Pierce County Sheriff's Office
- West Virginia University (CITeR)

Emerging Questions for Forensics

- FISWG working in shadow of NAS Report
- Need for standards, not just best practices
- WWW.FISWG.ORG
- Utilization of Iris for forensics – no legacy data?

Emerging Questions for Forensics – “Shout outs”

- NOTE on Type 20 – Original Reference Image Record
  - Need to retain original image/video
- Full-size files retained – no compression, no cropping, no resizing…
  - No common template/communication problems
  - Advances in State-of-the-art
- NOTE on Image Hashes throughout
  - Allows for automated verification of data files

ANSI/NIST-ITL 1-2011 Data

- ANSI/NIST-ITL 1-2007 Modifications included SAP Levels 50/51
  - Designed for 6 Mega-pixel images of face
  - 0.1-mm spatial resolution on plane of face
- Changes for 2011 geared toward forensics
- Anthropometric points for forensic face
  - Both 2D and 3D (when possible)

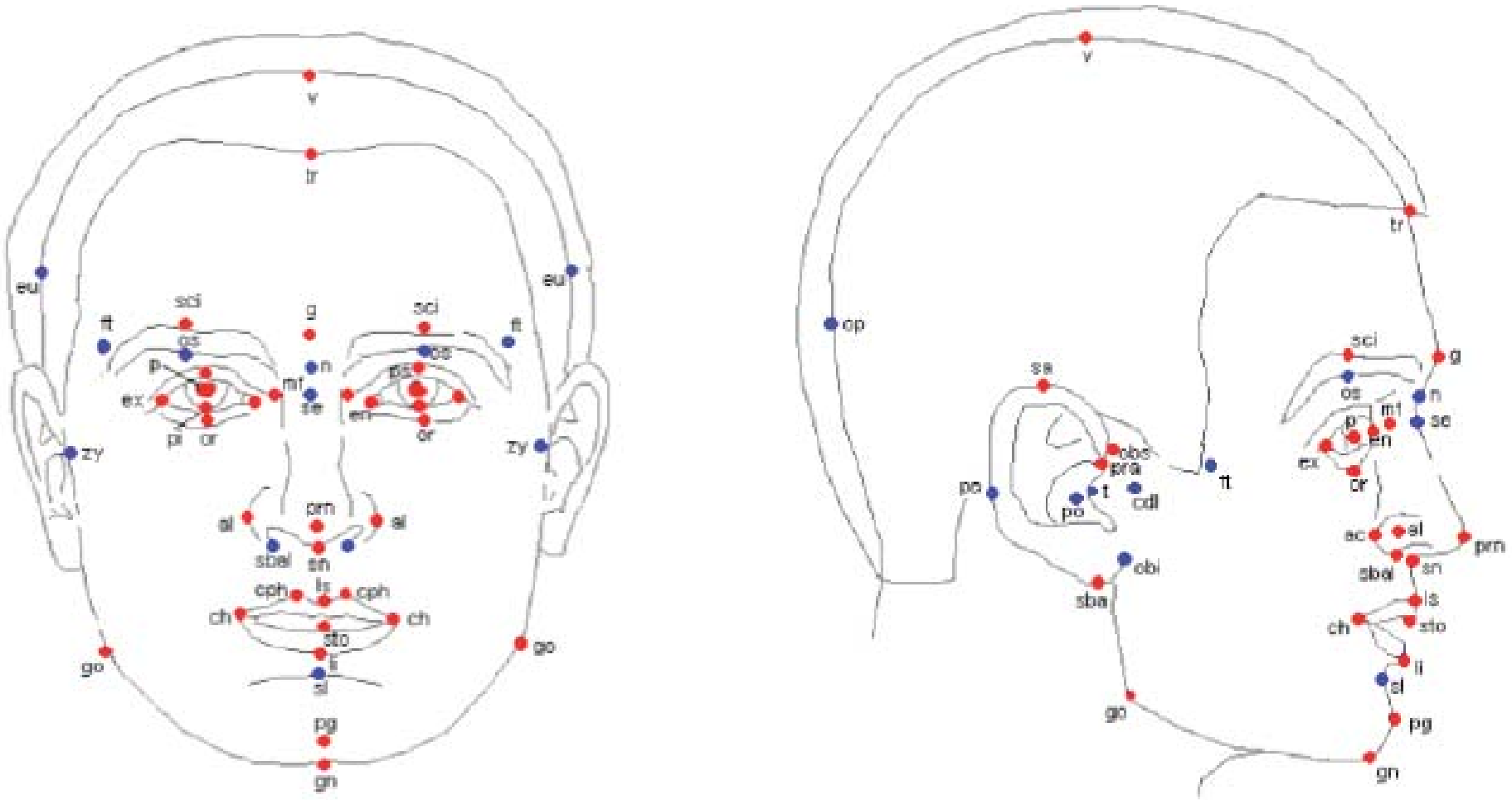
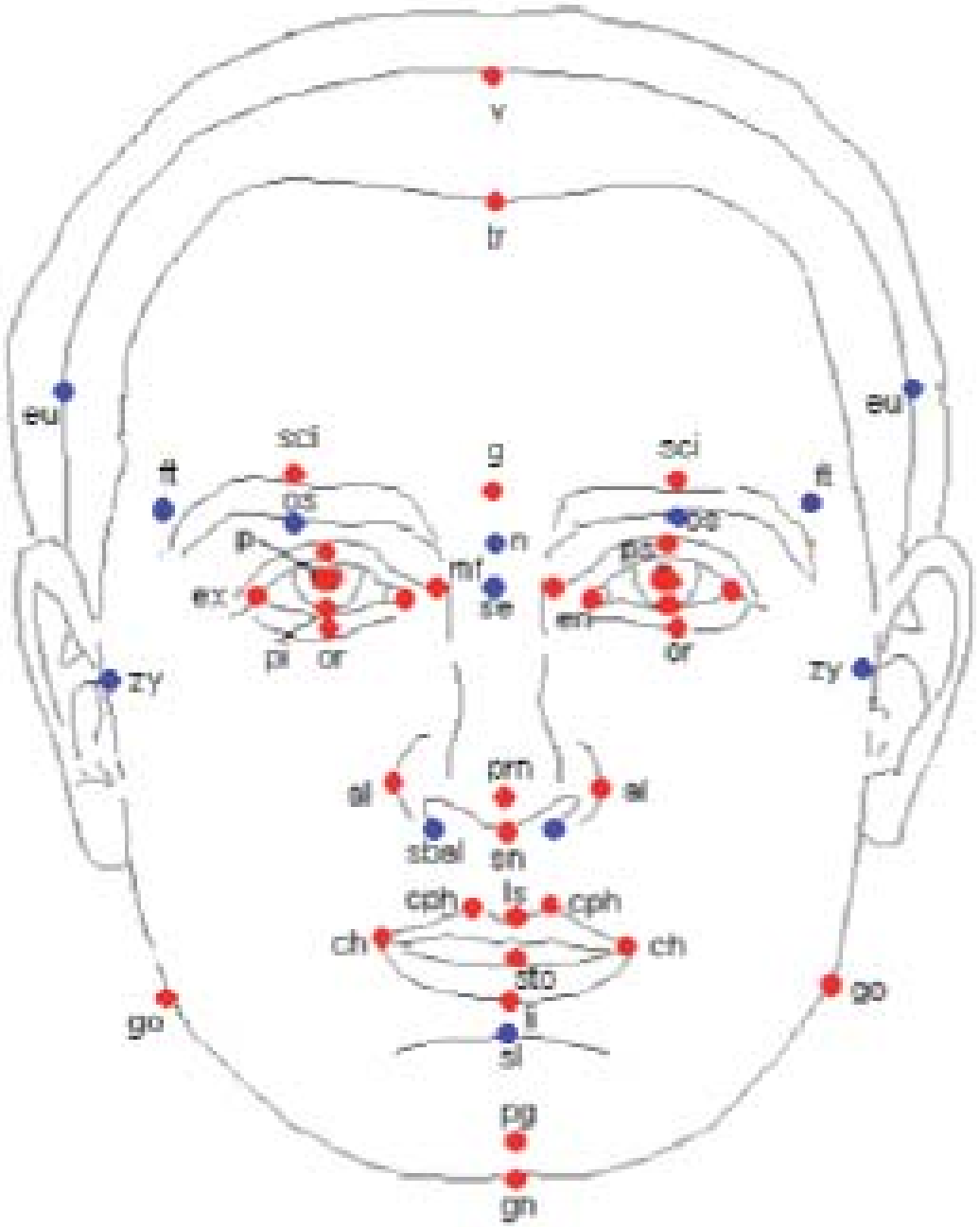


Figure 6 Anthropometric facial landmarks with (red) and without (blue) MPEG4 counterparts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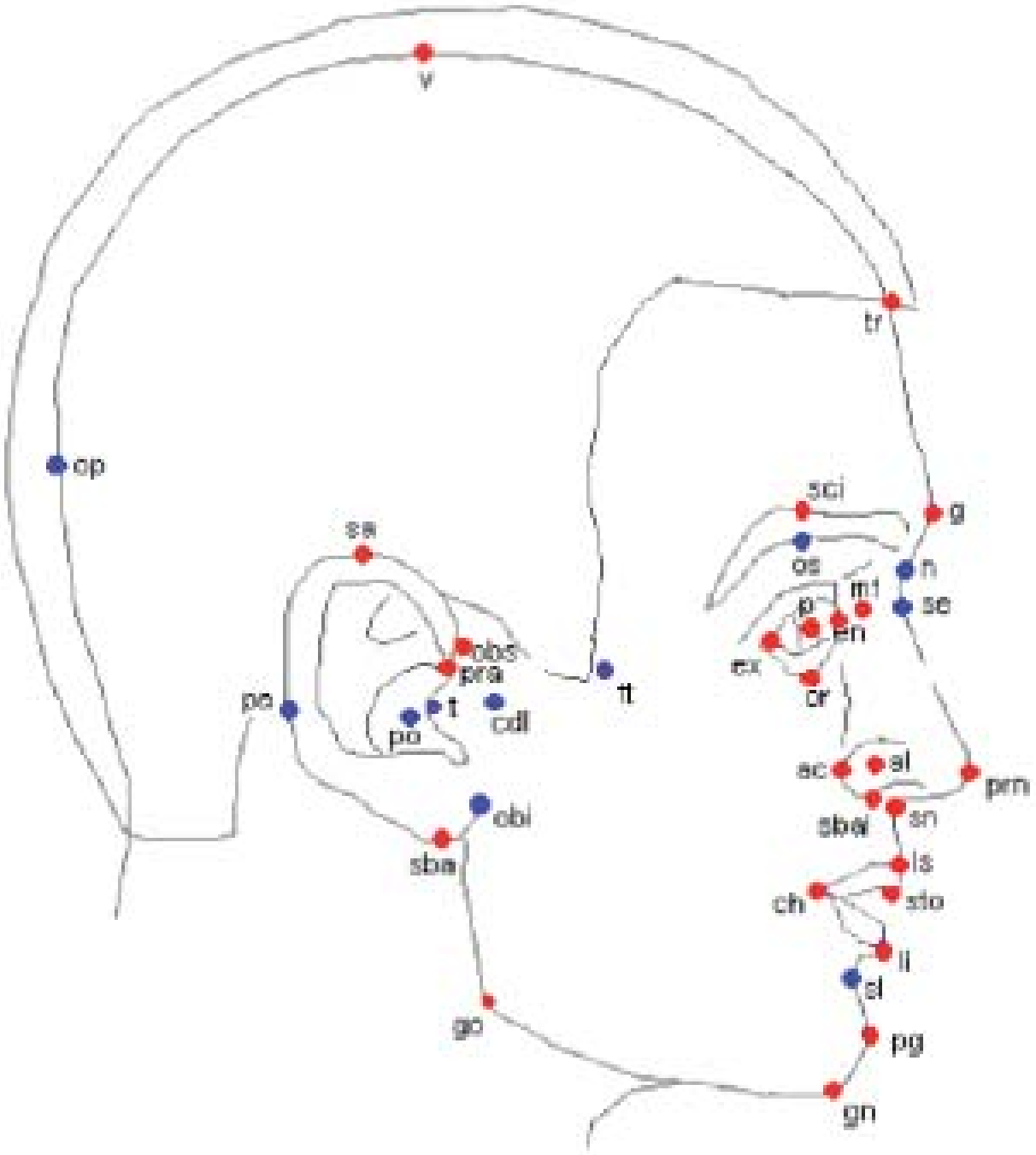
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MAGNA Study - Best subset of 30 landmarks from 62 Farkas points

Final 30 offers good overall coverage

(Reference: *Computer-Aided Forensic Facial Comparison*, Evison and Vorder Bruegge, 2010)

ANSI/NIST-ITL 1-2011 Changes for Forensics

15.28 Field 10.029: 2D Facial feature points

Short name: **FFP**

Long name: **FaceImageFeaturePoint**

The optional field shall be used for the exchange of facial image data feature points or landmarks. When present, it shall describe special attributes of manually or automatically detected facial feature points of the captured facial image. This information shall be entered as a six-information item feature point block as described in Table 17. Multiple facial points may be listed using these six information items.

Feature points shall be included in the record format if they have been accurately determined, thereby providing the option that that these parameters do not have to be re-determined when the image is processed for face recognition tasks.

Typically a computer algorithm will either accurately determine the position of the feature point or completely fail and provide either clearly erroneous or no landmark information. Therefore, a method for accurate determination is the use of computer-automated feature point determination followed by human verification and potential override of the computer determined feature points.

ANSI/NIST-ITL 1-2011 Changes for Forensics

- Additional fields for Face (highlights)
  - Face position in original image (Type 20)
  - Image Transform (resize, enhancements…)
    - Submissions cropped, placed in documents
  - Distortion (barrel, pincushion …)
    - Submissions cropped or distortion not noticed
  - Lighting artifacts
    - E.g., “Hot spot” or actual feature?

ANSI/NIST-ITL 1-2011 Changes for Forensics

- Iris – Looking ahead
  - Image data to improve comparison whether automated or manual

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