Biometric Quality Workshop

Quality Aspects of the ANSI/NIST Fingerprint Facial & SMT Data Exchange Standard

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ANSI/NIST-ITL 1-2000

☐ **Transmission Standard describing biometric data interchange formats used by law enforcement agencies**

☐ **Defines 16 record types to exchange information describing:**

- **Descriptive, demographic, and rap sheet**
- **Finger and palm print image and minutiae**
- **Facial image**

☐ **Updated version by the end of 2006**

- **Two workshops held**
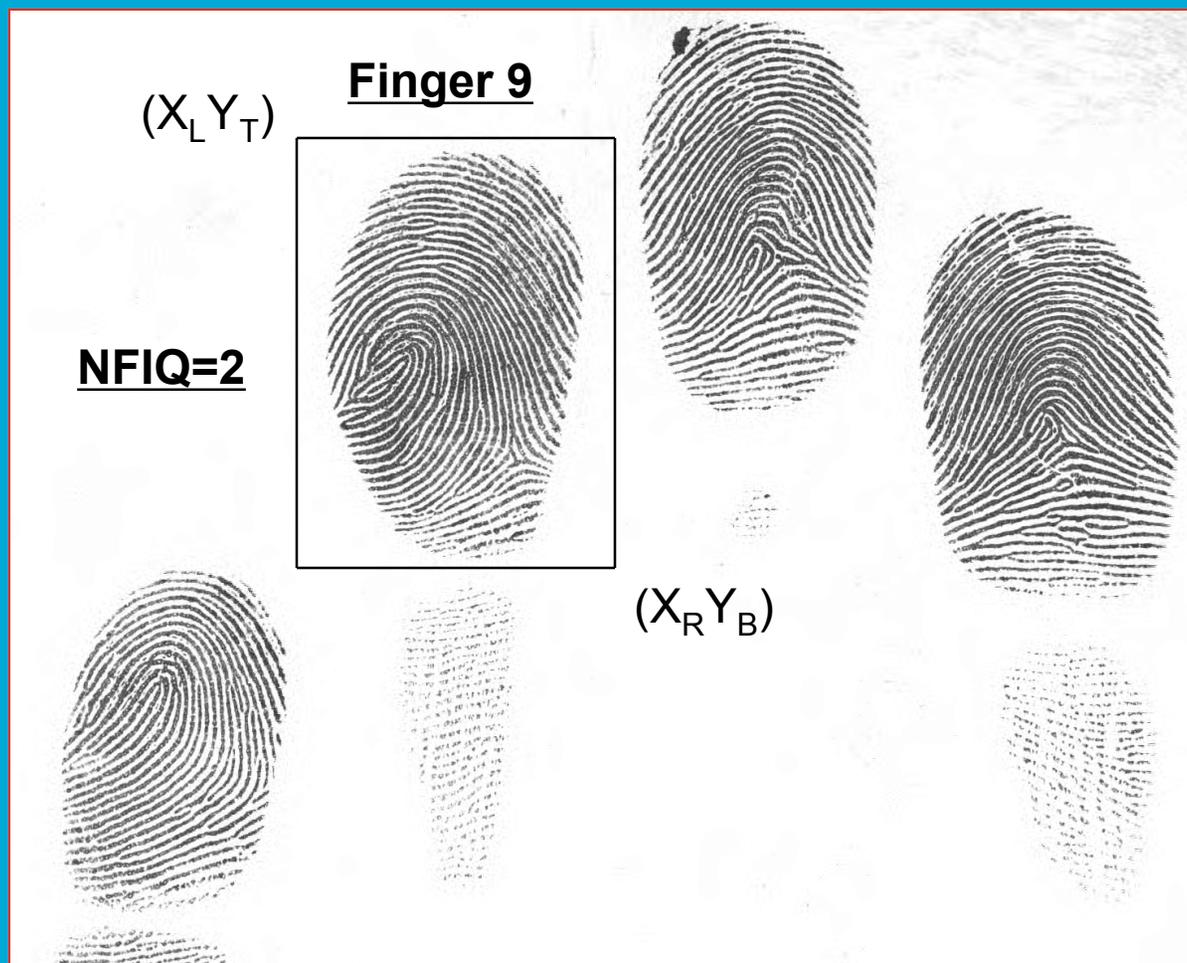- **Several ad hoc groups convened**

Proposed Updates to the Standard

NIST

- ❏ Harmonization with M1 minutiae & image formats
- ❏ Record for exchanging Iris data & other M1 data formats not defined by the ANSI/NIST standard
- ❏ Image compression algorithms specified
  - **JPEG 2000 & PNG**
  - **Compression codes formalized in standard**
- ❏ Changes to finger position/size/impression codes
- ❏ Optional field to provide device monitoring info
  - **Assisted, observed, Unattended, or Unknown**
- ❏ Part 2 - XML alternative version of the standard
- ❏ "Best Practice" for the capture of facial images

Fingerprint Image Quality Score

❒ Quality metric to predict matching performance

❒ Field 14.022 – Mandatory FBI EFTS 7.1 Finger Image Quality Metric

- ● Finger Number
- ● NFIQ Predictive Quality Score (1-5)

❒ Field 14.024 – Fingerprint Predictive Performance Metric

- ● Finger Number
- ● Predictive Quality Score
- ● Vendor Identification, algorithm code, version/revision

❒ Provision for additional scores

❒ Repeats for each finger of slap image – both fields

Segment & Assign NFIQ

Finger 9

$(X_L Y_T)$

NFIQ=2

$(X_R Y_B)$

Slap Image Segmentation & Quality Score

❐ Field 14.021 – Defines offsets to bounding boxes of individual fingers in a "slap" image
  - Finger number
  - X-coordinates (LEFT & RIGHT) Bounding box corners
  - Y-coordinates (TOP & BOTTOM) Bounding box corners

❐ Field 14.023 – Indication of the quality of the segmentation process
  - Finger Number
  - Predictive Quality Score
  - Vendor Identification, algorithm code, version/revision

❐ Provision for additional segmentation scores

Subject Acquisition Profile (SAP) Facial Image Capture Levels

NIST

❒ Field 10.013 - SAP Level

- Level 0: Unknown
- Levels 10-15: Complies with other facial standards or APIs
- Level 15 : PIV
- Level 20: Legacy mugshots
- Level 30: 1997 BPR & ANSI/NIST 2000
- Level 40: Added requirements (768x1024 pixels)
- Level 50/51: Increased resolution JPEG 2K required (3300x4400 head & shoulders)

Facial Image Quality Score

❒ Differentiates between quality scores generated by different algorithms and adjust for any differences in processing or analysis

❒ Field 10.025 - Subject Quality Score

- ● Quality metric used to predict the matching performance for a facial image
- ● Identification of the vendor of the quality algorithm
- ● Numeric product code assigned by the vendor
- ● Specifies the version of the algorithm used