

# **Biometric Quality Workshop**

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

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**[fingerprint.nist.gov/standard](http://fingerprint.nist.gov/standard)**

# **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**

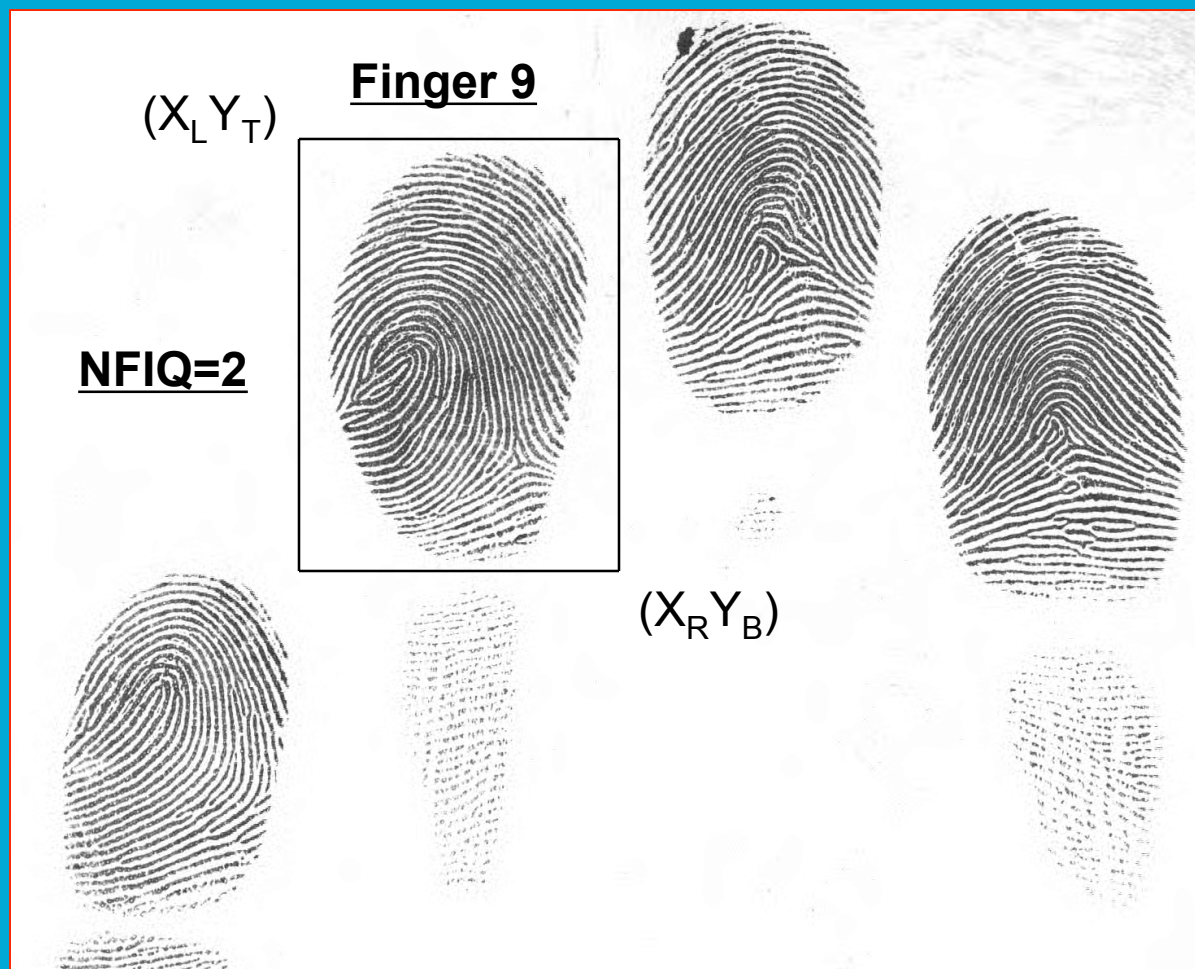
# Proposed Updates to the Standard

- ❑ 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



# 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

- ❑ 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