Why is Biometric Quality Important to DHS and Other Government Agencies?

NIST Biometric Quality Workshop

March 8-9, 2006

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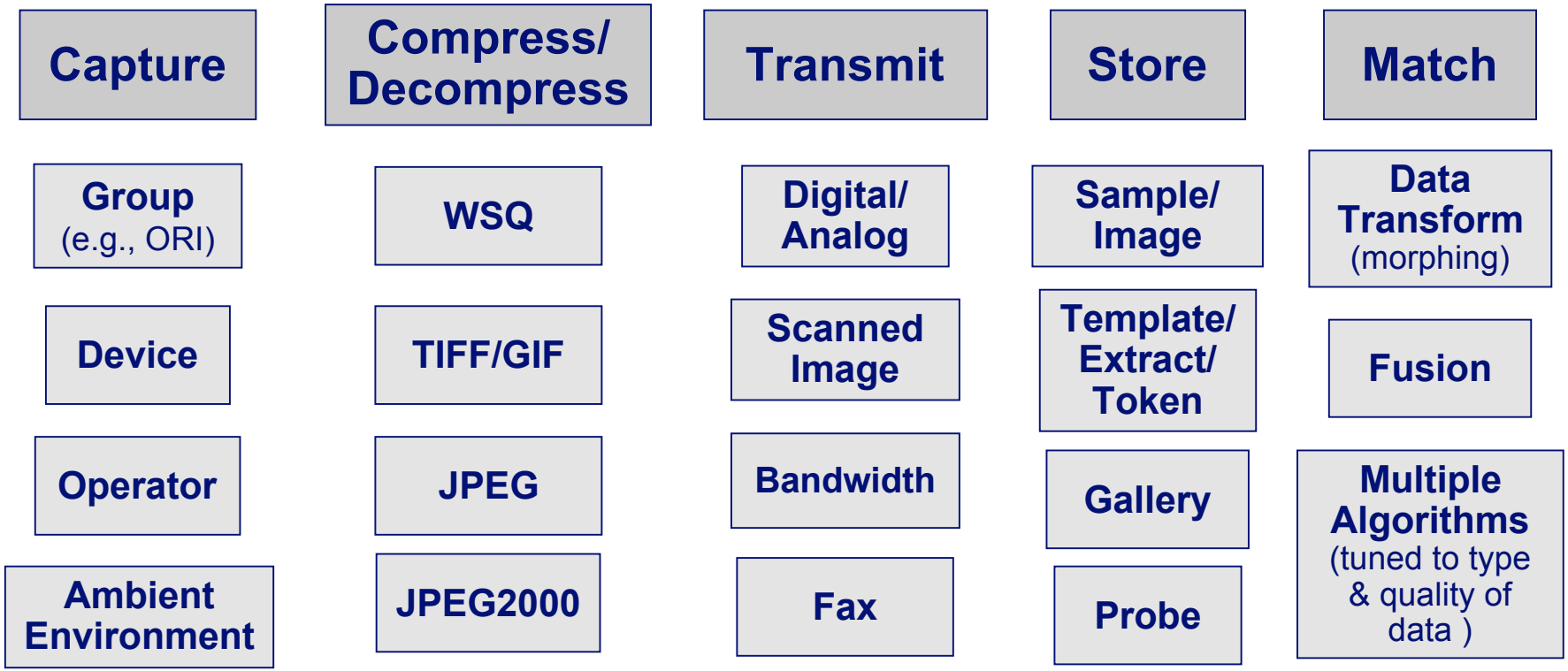
Biometric Data Quality Issues

- Knowledge of biometric data collection method and its integrity
  - Sources: scanned image, surveillance camera, passport photo, live capture, newspaper photo
- Data Integrity
  - Compression/decompression, transmission
- Data Quality
  - Measure of conformance to national and international standards
    - Applications include e-Passports, watch lists, and data exchange
    - Data format
    - Sample quality
      - Facial – full frontal, lighting, expression, etc.
      - Fingerprint – gray scale, ridge clarity, minutiae count, etc.
      - Iris – occlusion, reflection, etc.
      - Voice – background noise, bandwidth, etc.
  - Predictor of matcher performance
    - Tuned to specific system or generic across systems

Biometric System



SYSTEM

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Examples

- European Union's Visa Information System II (VIS II)
  - Multiple data collection devices, sites, transmission networks
  - Different matchers, compression characteristics
- EITS Concept
  - Querying national databases with a biometric sample for yes-no responses
- Applications with Control over Quality of Input Samples
  - Ability to determine whether or not to accept sample based on its quality
    - DHS US-VISIT
    - FBI IAFIS
- Applications with Limited or No Control Over Sample Quality
  - Watch lists
  - Artist sketches as probes
  - Latents
  - Surveillance images

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Challenge to Workshop Participants

- Should there be a universal quality measure for biometric capture by modality?
- Should there be some means of determining when to use multiple biometrics to address poor quality samples?
  - Whether to use multiple samples, instances, modes, or algorithms
- Should quality measures indicate to what level soft biometrics should be relied on to establish identity?
- Will stringent, mandatory quality measures inhibit future matcher algorithm developments and improvements?
- Can knowledge of capture approach be used to restore quality?
  - Example – photo taken with fisheye lens of known distortion and method of capture
- How does manipulating data samples impact quality?
  - Image enhancement
  - Morphing ¾ profile to full frontal
  - Removing background noise from voice sample

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