

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

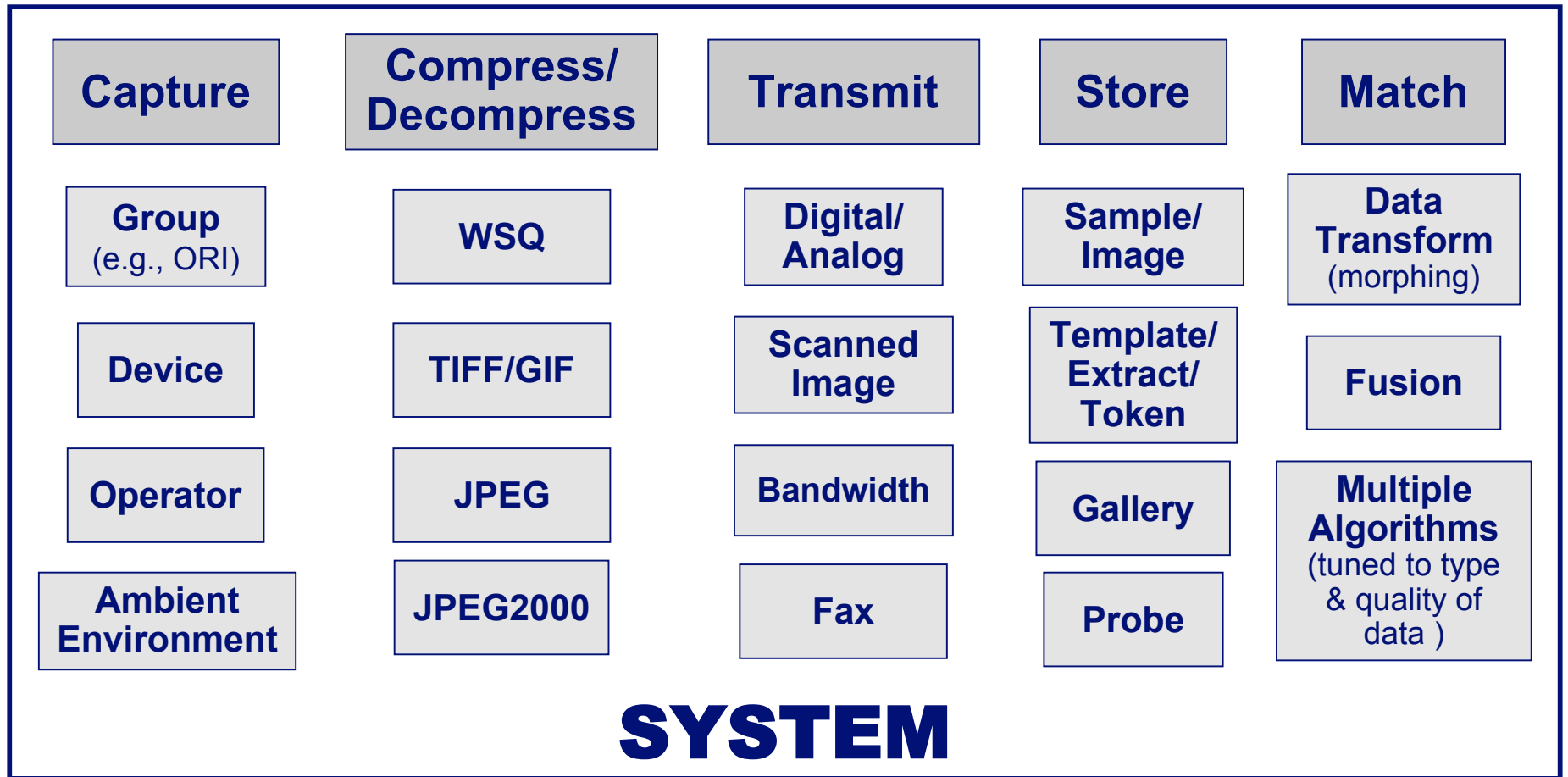
- Knowledge of biometric data collection method and its integrity
 - Sources: scanned image, surveillance camera, passport photo, live capture, newspaper photo
- Data Integrity
 - Compression/decompression, transmission
- Data Quality
 - Measure of conformance to national and international standards
 - 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



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Biometric 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 $\frac{3}{4}$ profile to full frontal
 - Removing background noise from voice sample



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