Information Technology Laboratory

Information Access Division (IAD)



#### Multiple Biometric Grand Challenge Workshop: Welcome

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#### **NIST Mission**

To promote U.S. innovation and industrial competitiveness by advancing

measurement science, standards, and technology

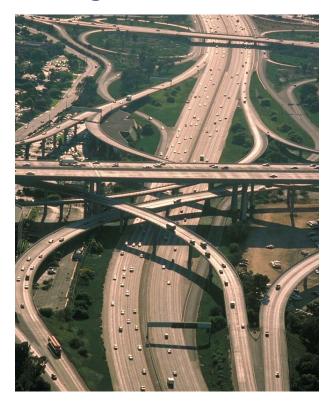
in ways that enhance economic security and improve our quality of life





#### NIST technical infrastructure paves the way to innovation

The equivalent of research "roads and bridges" the industrial and scientific communities need to develop and commercialize new technologies



- Groundbreaking research tools that foster new fields quantum information, nanotechnology, bioscience
- Better measurement methods to ensure quality
- Performance measures for accurate technology comparisons
- Standards to assure fairness in trade



## NIST biometrics work focuses on

- Needs of industry, government, and academia in R&D for enhancing biometrics technologies
- Needs from USA Patriot Act and Enhanced Border Security and Visa Entry Reform Act
  - NIST works very closely with DHS and supports US-VISIT (entry/exit system for foreign visitors)
- Needs for law enforcement & Intelligence Community
  - NIST works very closely with the FBI
    - Integrated Automated Fingerprint Identification System (IAFIS) largest biometrics database in the world; Next Generation Identification (NGI)
  - NIST works closely with National Institute of Justice on DNA
  - NIST works closely with the R&D components of the Intelligence Community
- Needs for Homeland Security Presidential Directive-12
  - Personal Identity Verification (PIV) ID card for federal employees and contractors
- Needs defined by White House National Science & Technology Council (NSTC) Subcommittee on Biometrics and Identity Management
  - "National Biometrics Challenge"



### What NIST does in biometrics

#### Standards Development

 Work with others to accelerate the development of consensusbased standards which are closely coupled to the stated needs of private industry

#### Development of test and evaluation methods

- Develop metrics, testing design, evaluation methodology, performance & conformance testing, data collection and formatting
- Perform tests and evaluations
  - On both research systems and vendor products
- Develop and transfer technology



# **NIST biometrics technical focus**

- Fingerprints
  - (Includes Latent Fingerprints)
- Face
- Iris
- Voice
- DNA
- Multimodal



## **NIST biometric standards activities**

- NIST Standards
  - ANSI/NIST ITL 1-2007 Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information – used in law enforcement and interagency biometric data exchange
  - NIST Special Publication 800-76-1 -- Biometric Specification for Personal Identity Verification – as part of FIPS for PIV cards
- American National Standards
  - International Committee for Information Technology Standards (INCITS)
- International Standards
  - International Organization for Standardization/International Electrotechnical Commission (ISO/IEC)



# **Finger Projects**

- [ELFT] Evaluation of Latent Fingerprint Technologies
  - Evaluate and advance latent fingerprint matching technologies
- Fast Fingerprint Capture Evaluation
  - Develop methods and standards for evaluating next generation fingerprint acquisition systems; e.g. contactless and 3D
- [MINEX] Minutiae Exchange Tests
  - MINEX04 -- Interoperability of INCITS 378 fingerprint template
  - Ongoing MINEX -- Supports compliance for Personal Identity Verification (PIV) program
  - MINEXII -- Fingerprint template interoperability with Match-on-Card technologies
- [PFT] Proprietary Fingerprint Testing
  - SDK fingerprint matcher tests
- [SlapSeg] Slap Segmentation Tests
  - Evaluate the performance of slap fingerprint segmentors
- Usability
  - Study efficiency, effectiveness, & acceptability of biometric systems from perspective of human interaction



## **Face Projects**

- [FRGC] Face Recognition Grand Challenge
  - Advance state of the possible with face recognition
- [FRVT] Face Recognition Vendor Tests
  - Evaluate state of the possible with face recognition

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# **Iris Projects**

- [ICE] Iris Challenge Evaluation
  - Evaluate the accuracy of iris matching technologies
- IREX08] Iris Exchange Test
  - Study and compare accuracy as related to iris compression levels and alternative image formats



## **Voice Projects**

- Speaker Recognition Tests
  - Evaluation of speaker identification technologies
- Speech Biometrics
  - Develop methods for standardized speech enrollment followed later by 1-to-many speaker identification

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#### **DNA Projects**

 Develop standards and methods for processing and matching DNA



## **Multiple Biometrics**

- Large-Scale USG Systems (e.g. FBI IAFIS/NGI & DHS US-VISIT)
  - Conduct benchmarking & performance evaluations
  - Develop and evaluate next generation biometrics capabilities & integration of standards
  - Evaluate system interoperability
- [MBARK] Multimodal Biometric Application Resource Kit
  - Develop client-side technologies and standards for multimodal biometric acquisition
- [MBGC] Multiple Biometric Grand Challenge
  - Evaluate the performance with multimodal use of face and iris
- Quality
  - Develop standards and methods for evaluating and utilizing biometric sample quality