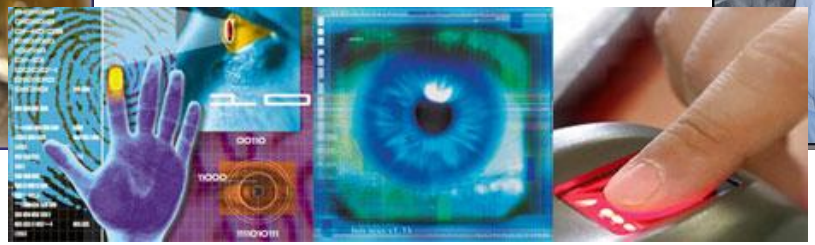
Introduction to Biometrics and Biometric Systems



Terminal Learning Objective

- **Action:** Describe common Biometric collection and processing systems and associated equipment and capabilities.
- **Condition:** Given student handouts and class notes.
- **Standard**: Describe current Biometric Systems, equipment, and capabilities.

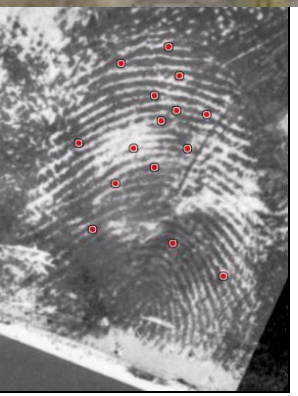
Administrative Data

- **Safety Requirements: None.**
- **Risk Assessment: Low.**
- **Environmental Conditions: None.**
- **Evaluation: Student Checks.**

Agenda

- Overview of Biometrics
- How Biometrics Supports Your Mission
- Tactics, Techniques and Procedures
- Summary and Questions

How Does Biometric Technology Support Your Mission?



(U) 15 March, Fingerprint Match Made.
Initial Information given to NGIC by both the Biometric Management Office-Biometric Fusion Center (BMO-BFC) and FBI-Terrorist Explosives Device Analytical Center (TEDAC)

- **Name:** **Ali Hasan, Makar Raheed**
- **DOB:** **19700101**
- **Date of Arrest:** **20031126**
- **Arrest Charge:** **Weapons**
- **FBI Case #:** **HQ-C1441327-1619-F01009600**

Biometrics Defined

- Bio (life) + Metrics (measurement)
  - Biometrics is the Measurement of Life
- 2 types of biometrics: Physiological and Behavioral
- Used to verify the identity or claimed identity of an individual

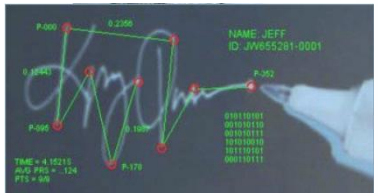
Current Biometric Modalities

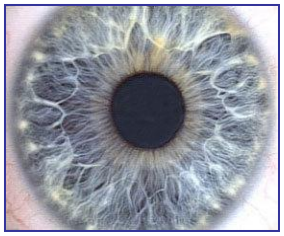
Physiological

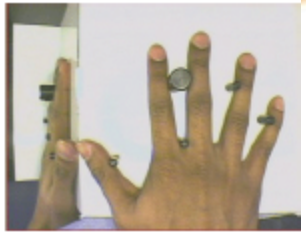
- Iris Scan
- Finger and Palm Prints
- Hand/Finger Geometry
- Vascular Imaging
- Facial Recognition
- Voice Pattern
- Retina Scan
- DNA
- Odor, Earlobe, Sweat pore, Lips

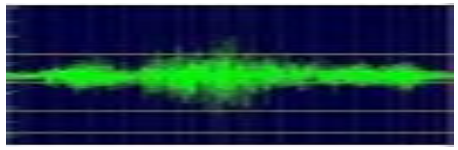
Behavioral

- Signature
- Keystroke
- Speech Recognition
- Gait







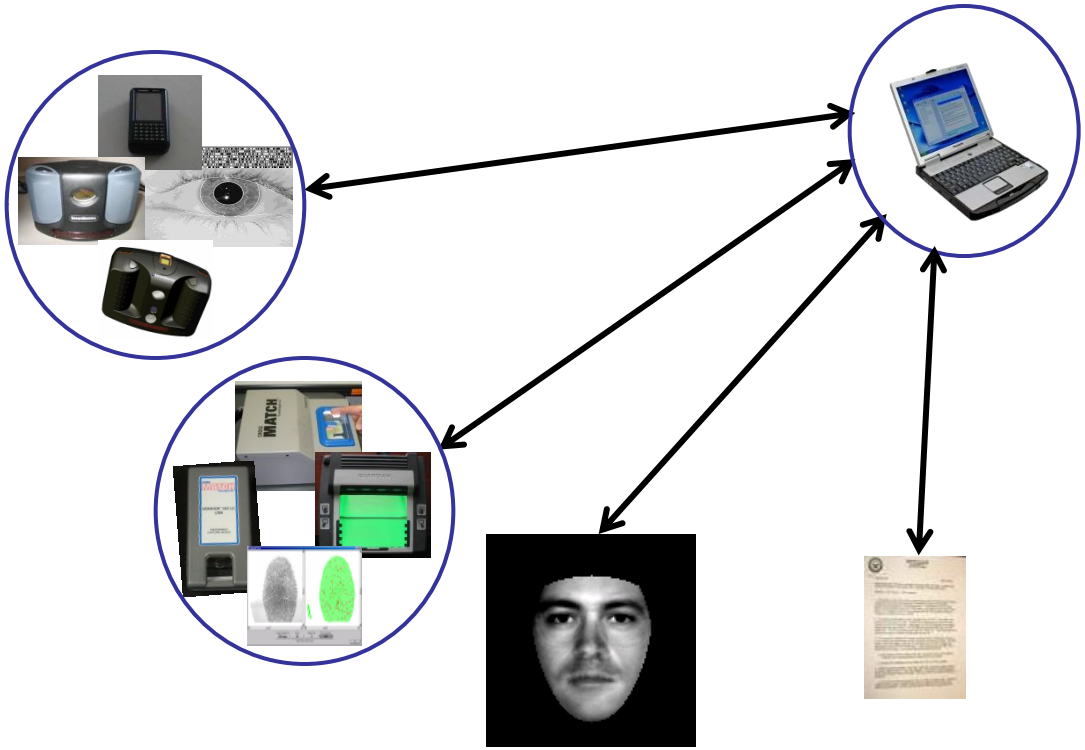


Origin of Current Biometric Systems

- Origin of Biometric Automated Toolset (BAT) and the Handheld Interagency Identity Detection Equipment (HIIDE):
  - US Forces in Kosovo lacked ability to positively identify Local National Hires (LNH); a LNH could be fired but could go to a different camp and get re-hired.
  - Biometrics Automated Toolset (BAT) introduced in Kosovo in 2001. BAT provided a concrete identification means.
  - HIIDE developed to provide an untethered, portable biometric collection and identification platform. Fielded to Army Spring 2007.
- BISA developed for Iraq to provide for a system of identifying, vetting, and tracking local national hires (LNH) and locally employed personnel (LEP).

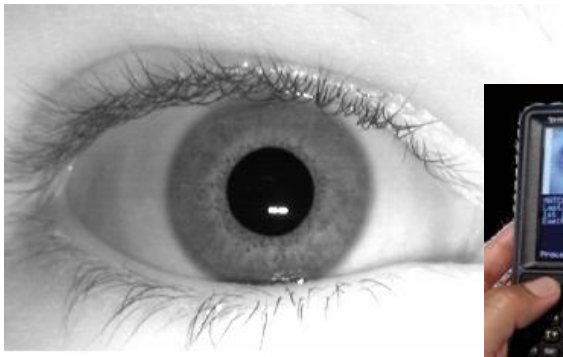
What is BAT?

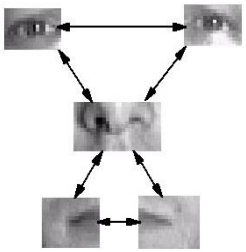
- Software program
  - **Collect** Biometric and other Identifying info
  - **Save** biometrics and info to database
  - **Query** and **Search** the database (currently 1.2 Mil and growing)



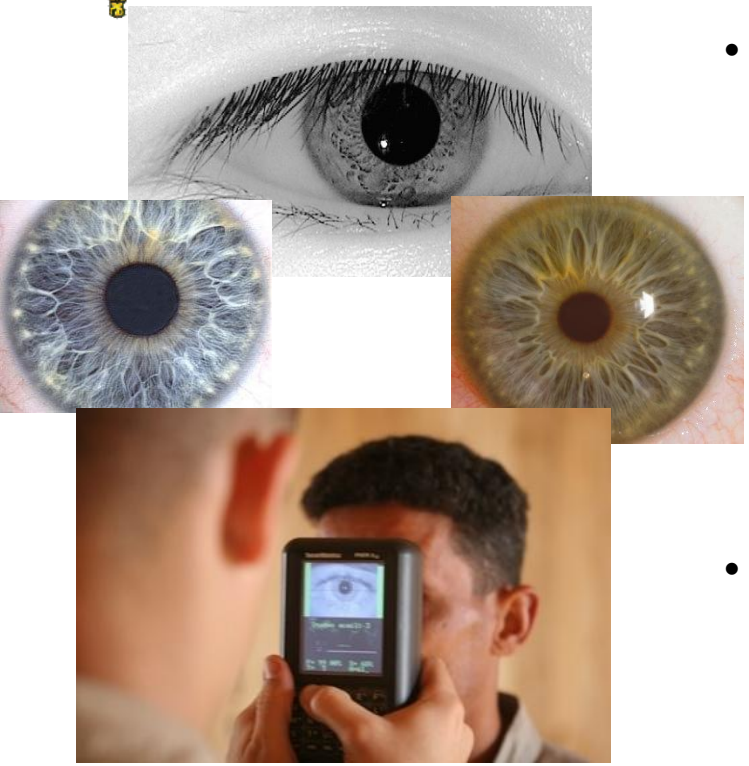
- **Current Uses**
  - Anti-terrorism/Force Protection Screening (AT/FP)
  - Detainee Operations
  - Sensitive Site Exploitation
  - Intelligence/High Value Target
  - Border Control/Port of Entry Operations
  - Population Census and Control
  - Civil Military Operations

Three Biometrics Used by BAT





Iris Recognition

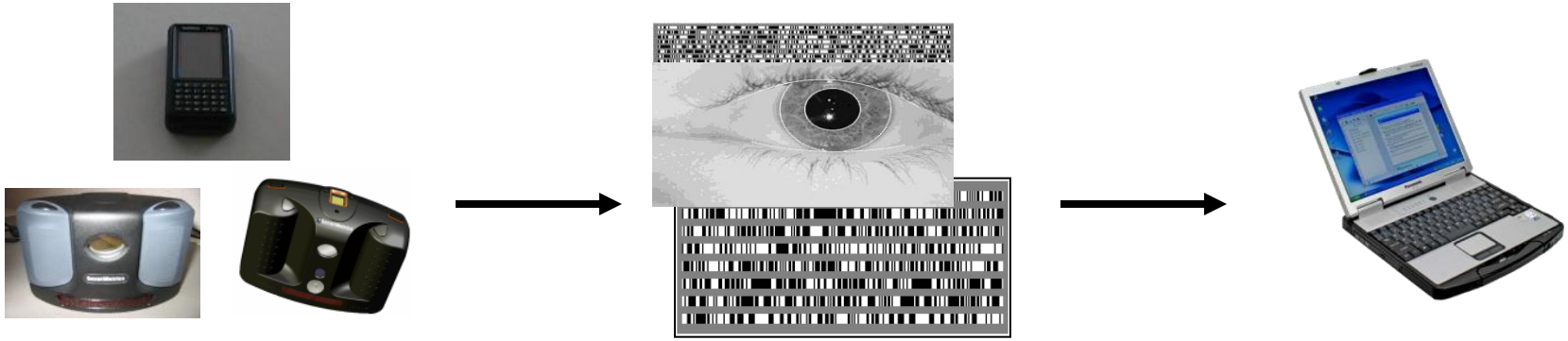


- **BAT incorporates a handheld Iris Recognition Device developed by Securimetrics, Inc.**

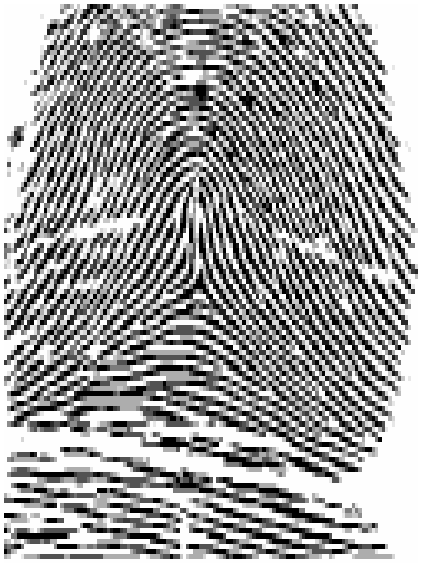
  Scalable and fast, capable of providing real-time responses.

  Extremely accurate identification with a False Acceptance Rate of: 1:1.2 million.

- **Represents each iris as a small, 512-byte Iris Code. An average jpeg photograph is 1.6Mb or 1,600,000 bytes.**



Fingerprint Recognition



- BAT incorporates a Fingerprint capture and identification engine developed by Neurotechnilogija
- One of the oldest and most recognizable biometric modalities.
- Extremely accurate identification.
- Searchable against FBI Automated Fingerprint Identification System (AFIS) database
- Searches on Flat and Rolled Prints

Facial Recognition

- The Biometrics Automated Toolset incorporates a Face Recognition Engine developed by Lau Technologies, Inc.
- Ability to take photos from BAT and make 3D images
- Accuracy reduced by external variables such as light, distance from the subject and facial position.
- Represents faces as an extremely concise 128-byte “eigenface” template for minimal storage and improved search speed
- Used by the State Department to find duplicate visa applicants, by motor vehicle divisions, by law enforcement agencies and in Department of Defense initiatives.

Handheld **I**nteragency **I**dentity **D**etection **E**quipment (**HIIDE**)

- Handheld, Tactical, Multi-modal, Biometric <u>Enrollment and Identification</u> Device

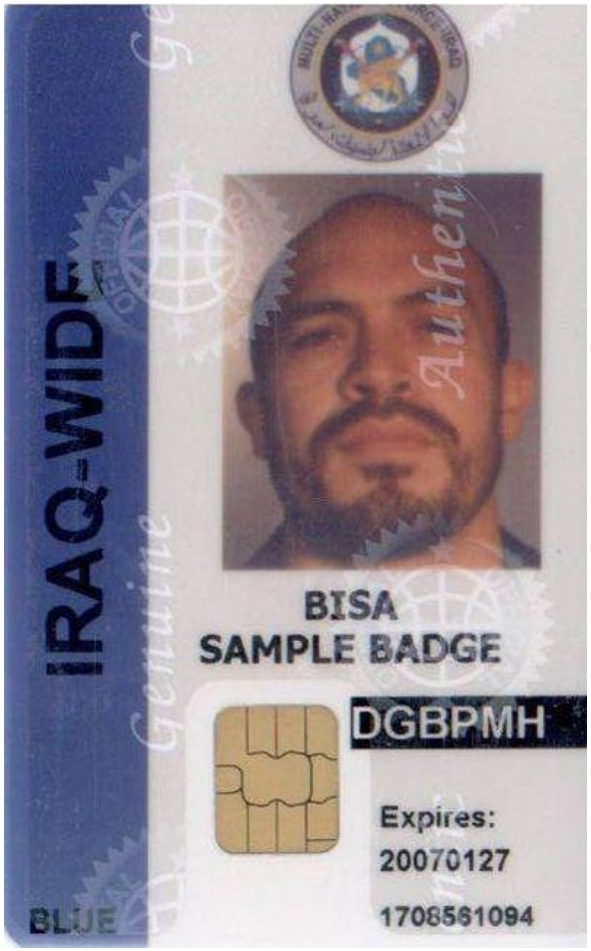
- Tactical extension of the Biometrics Automated Toolset (BAT)

HIIDE System Description

- Collects Iris, Fingerprint, photograph and Biographical data
- Creates a “portfolio” that can be imported into the BAT system as a digital dossier.
- Watch lists can be imported into HIIDE from BAT for on the objective identification.

Biometric Identification System for Access (BISA)

- Collects biometric data and biographical information from all visitors
- Uses ID Badge and biometric to ensure person is who he/she says they are
- Vetted against other databases via NPRnet



Biometric Architecture

Detainees, LEPs, Persons of Interest

Main Server Qatar

Other DOD Agencies/COCOMS

Interpol

DOS

DHS US VISIT

State

Local Govt

Latents

NGIC

BTF-West

DoD ABIS

55,000,000 +

IAFIS

Other Biometric data

SIPRNET

NIPRNET

Your role in collecting Biometrics

- Ties a person to their biometrics, not just their name
- Eases Identification of foreigners/possible enemies
- Collects other Intelligence information
- Database accessible/searchable by many
- Allows identification at the tactical level
- Provides information for criminal prosecution

Caution:
Data is only as reliable as the person who collected and entered it!

Summary

- Biometrics defined
- Purpose of Biometrics
- Core biometric functions
- Origin of current systems and architecture
- Mission; Tactics, Techniques and Procedures
- Biometric Modalities and Systems

Questions

BIMA
BIOMETRICS
IDENTITY
MANAGEMENT
AGENCY

TRAINING CERTIFICATE

This is to certify that _____

has completed the Introduction to Biometrics and Biometric Systems training.

_____ 14-Oct-2011

Signature Date