

Keystroke and Mouse Movement Biometric User Authentication



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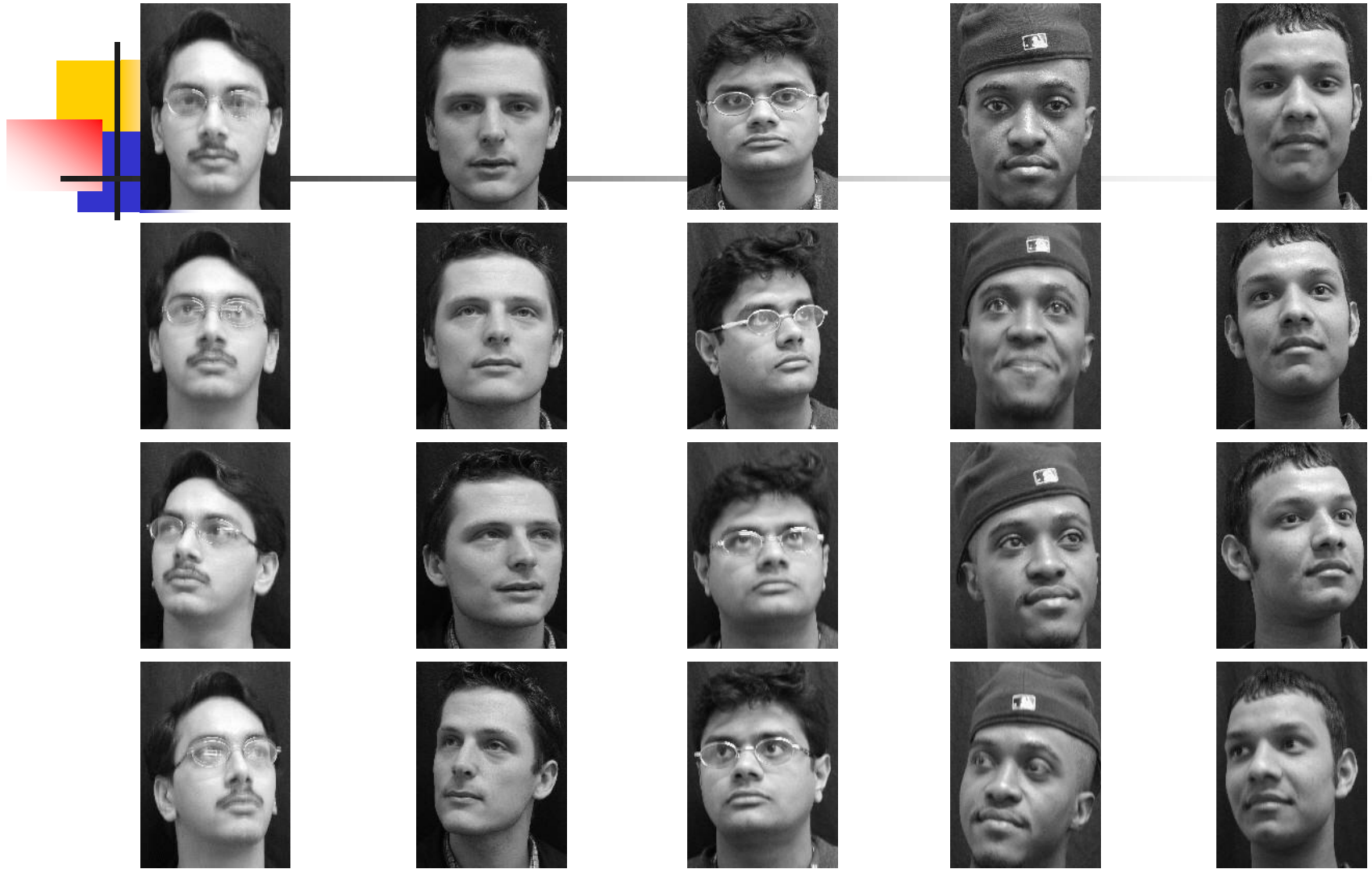
What are Biometrics?

- Biometrics refers to identification of humans by their characteristics or traits
 - Physical traits
 - Fingerprint, Face, Iris
 - Behavioral traits
 - Signature/handwriting, Voice
 - Keyboard and mouse input
 - Videos
 - <http://www.biometrics.gov/>
 - [Biometric Security](#)
 - [Hand Gestures](#)

Fingerprint Verification



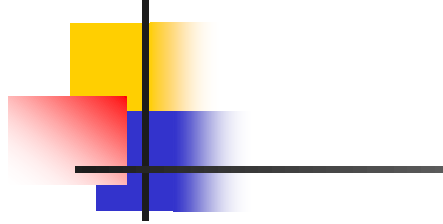
Face Recognition



Face Recognition: System

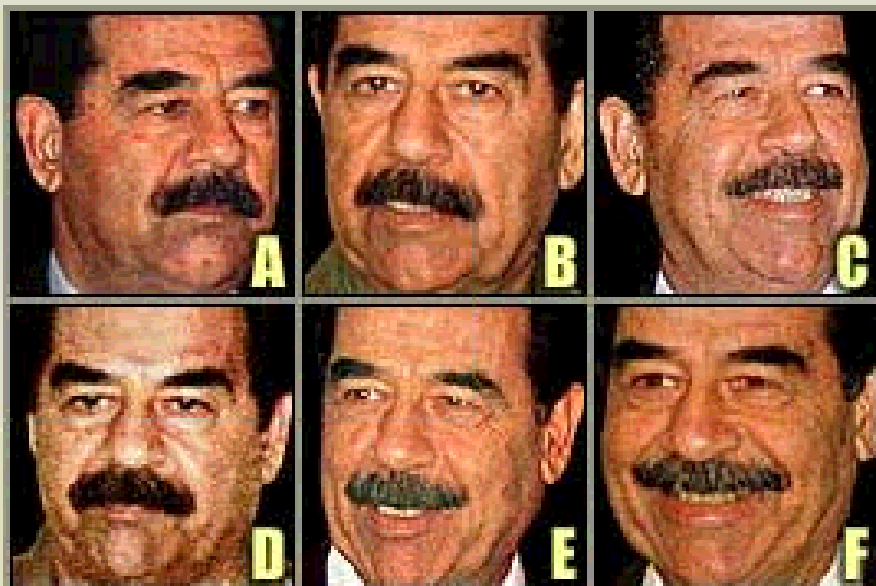


Inspirational Portrait of Individuality



Face Recognition: National Security

Will the Real Saddam Please Stand Up?



Multiples of a Madman: With the help of facial recognition technology, a German TV station claims to have identified at least three [look-alikes posing as the Iraqi president](#).

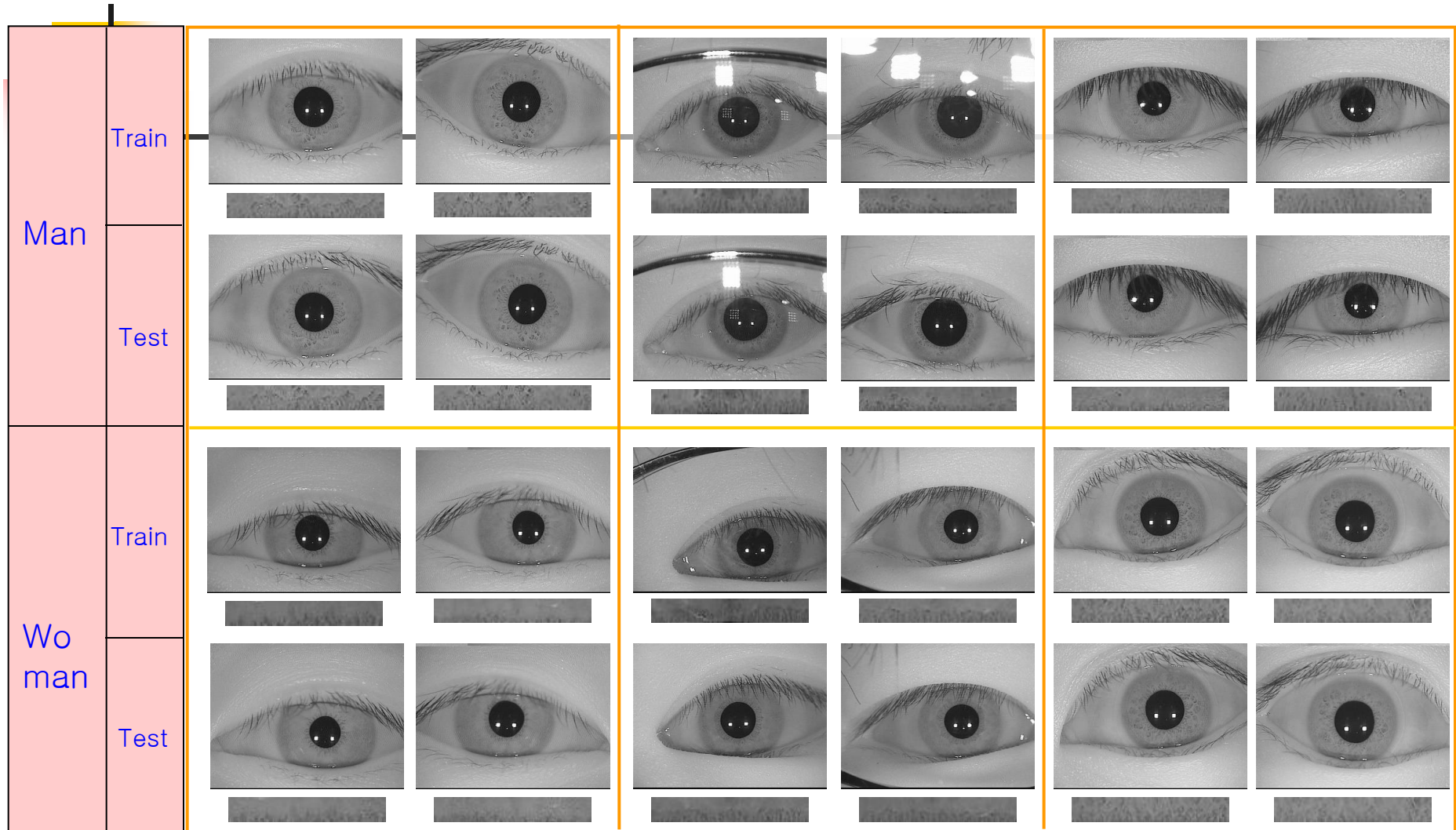
Place vote below

Though impossible to know for certain, which do you think is the photo of the real Saddam?

- Photo A
- Photo B
- Photo C
- Photo D
- Photo E
- Photo F
- All are of Hussein

Vote

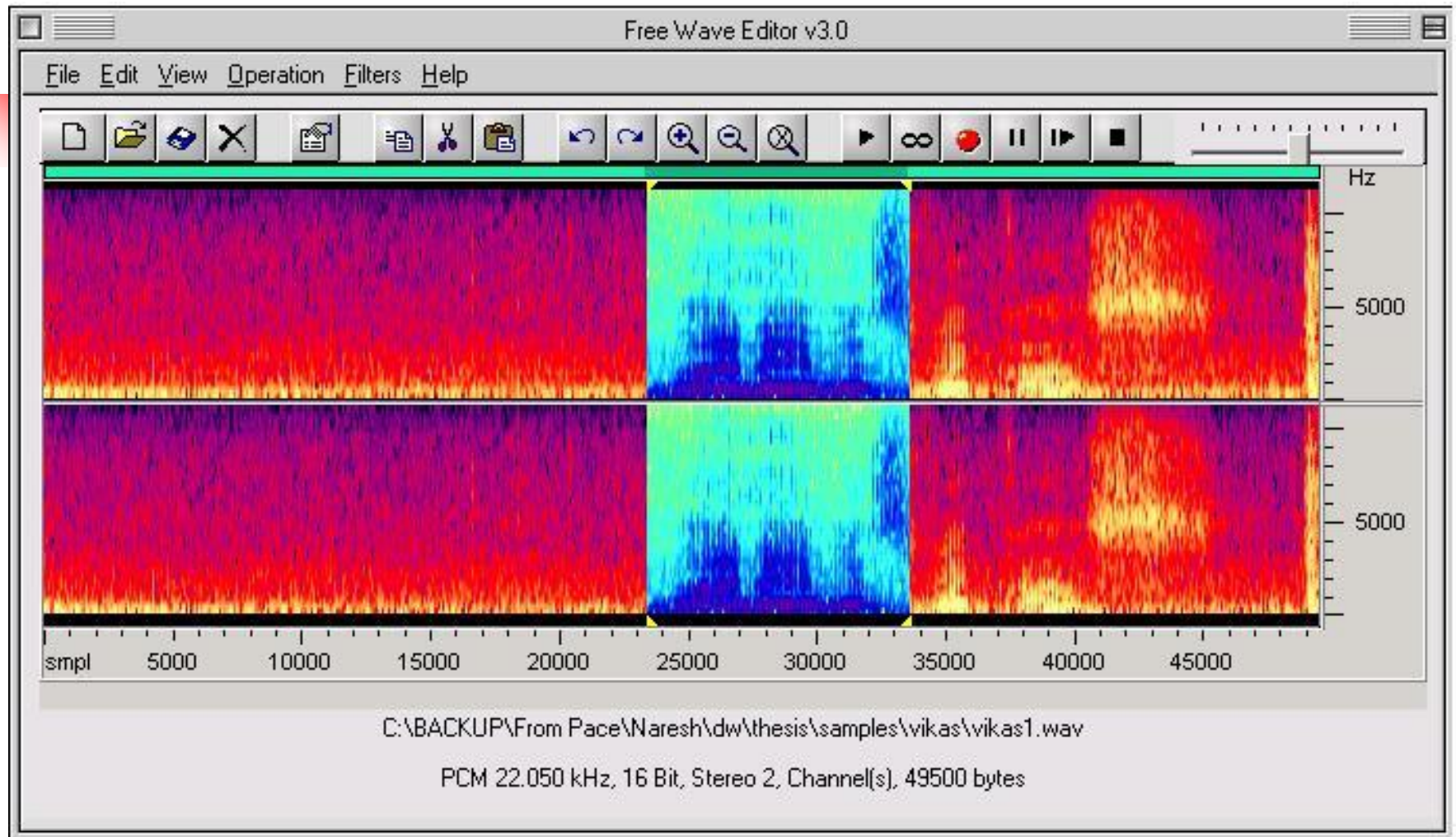
Iris Authentication: Data



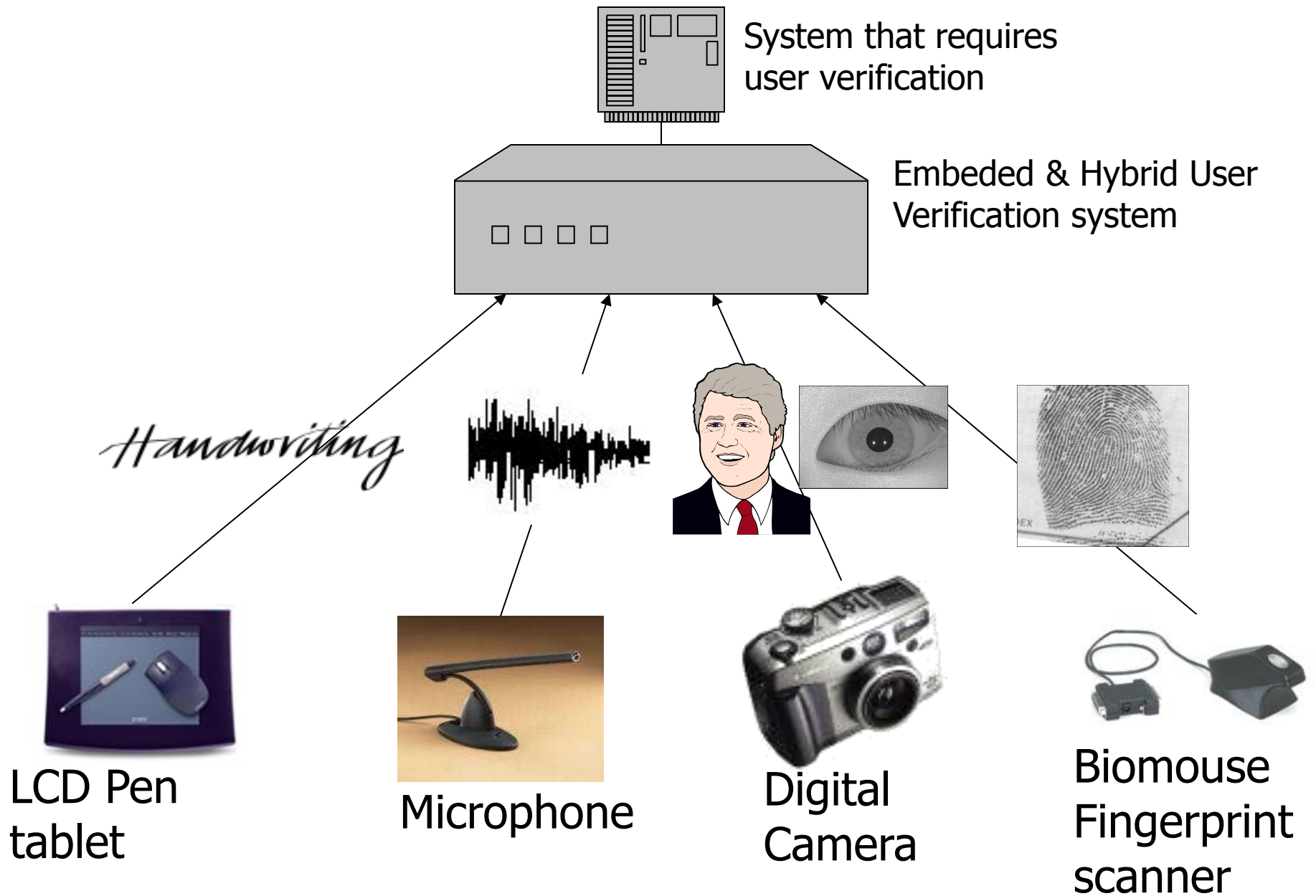
Biometric Authentication



Speaker Individuality: "My name is ..."



Multi-modality Biometric Authentication





Keystroke and Mouse Movement Biometrics

- Based on idea that generated patterns are unique to individuals and difficult to duplicate
- Appeal of these over other biometrics
 - Not intrusive, inexpensive, continual user verification
- These are some of the less-studied behavioral biometrics



Earlier Keystroke Biometric Studies

- Mostly on short input of a few seconds
 - Commercial products on hardening passwords
- Our interest – long input of several minutes



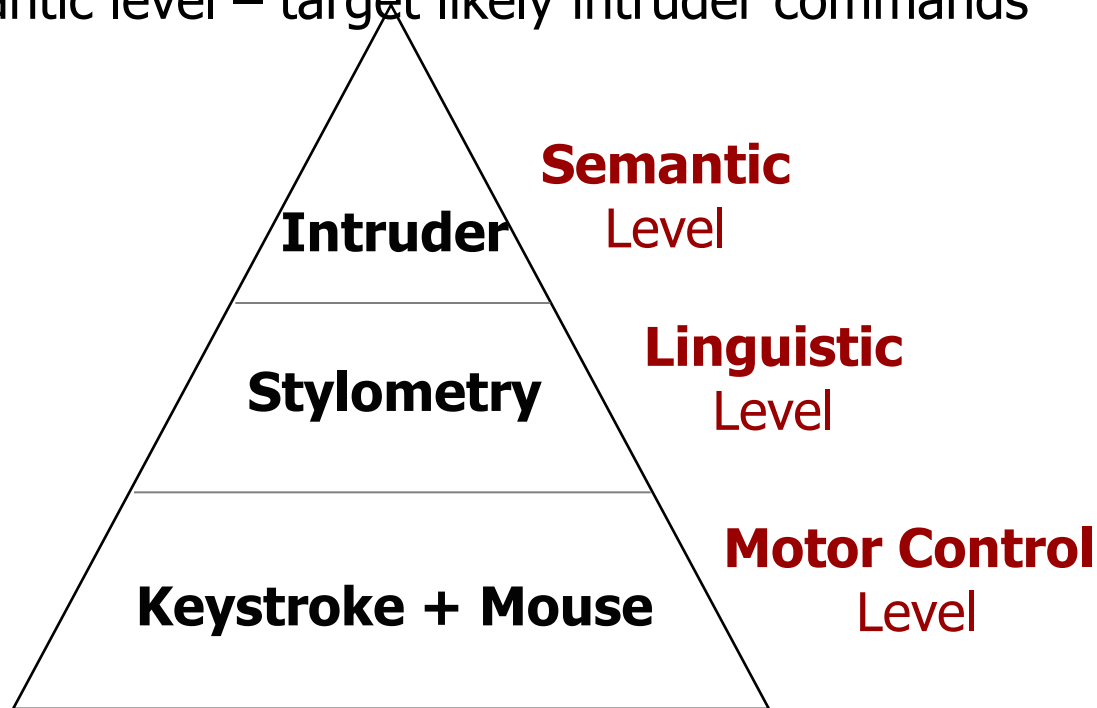
Importance of Keystroke & Mouse Biometrics

Continual Authentication of Computer Users

- U.S. DoD wants to continually authenticate all government computer users, both military and non-military
 - U.S. DARPA 2010 and 2012 Requests for Proposals
 - Requirement – detect intruder within minutes
- Authentication of students taking online tests
 - U.S. Higher Education Opportunity Act of 2008

Possible Broader Intrusion Detection Plan Multi-biometric System

- Motor control level – keystroke + mouse movement
- Linguistic level – stylometry (char, word, syntax)
- Semantic level – target likely intruder commands





Current Keystroke & Mouse Study Data Collection

- Use Vinnie's [Data Taker Application](#)
 - URL: <http://vmonaco.com/biometrics/logger>
 - Must use standard desktop PC keyboard and mouse (do not use a Mac)
- Editing task (start today, complete later)
 - Each participant enters & edits 6 paragraphs (2 twice)
 - do scenarios 1&2, then scenarios 1-6, repeating 1&2 (total=8)
- Browser task (start next time, complete later)
 - Each participant conducts 6 Internet searches (2 twice)



Your Role in this Study

- Provide Experimental Data
- Write Research Day 2013 Conference Paper
 - See last year's papers at Research Day 2012
 - Background material
 - Biometrics, but focus on keystroke and mouse movement
 - Importance of study – applications
 - Literature: journal and conference papers better than Web
 - Google "Keystroke biometric" and "Mouse movement biometric"
 - Describe experimental data and collecting procedures
 - We will provide the experimental results