

July 2016

Identity Matters



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IBIA • Biometrics + Identity

Security of Biometric Data: Spoofing and Data Theft

What is Biometric Spoofing?

- The use of an artificial or altered sample to defeat the security of a biometric system in order to ...
 - ... falsely match someone else's identity.
 - ... conceal one's own true identity.

Some Terminology

**Spoof
Detection**



**Liveness
Detection**

Presentation Attack Detection

Examples



Image sources:

(L): http://www oulu.fi/infotech/annual_report/2013/cmv

(M): IBIA Biometrics 101

(R): http://twiki.di.uniroma1.it/pub/Interazione_av/WebHome/LezioneInterazione250310.pdf

Increasing Spoofing Difficulty



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Multi-modal Biometrics

SpooF Detection

- Challenge and response
 - “Repeat the random phrase ... ”
- Check temporal characteristics of the sample
 - Involuntary motion, physiological responses
- Check physical properties of the sample
 - Texture and optical characteristics

Sources of Spoof Data

- Primary sources
 - Example: face image
- Secondary sources
 - Example: latent fingerprint
- Sensor data
 - Man in the middle
 - Enrollment database

Biometric Security Architecture

- In general, biometric systems should be designed to incorporate the best security practices of functionally similar systems.
 - Encrypted databases and communications
 - Proper key management
 - Tamper resistance

Unique Considerations for Biometric Systems

- Biometric images are converted to mathematical summaries (“templates”) which are then used for biometric matching.
- If templates are encrypted when stored in a database, they generally must be decrypted for matching.
- Image-to-template conversion, template decryption and template matching should occur in trusted execution environments.

Convenience and Security

- The level of security and convenience of a system are reciprocally related.
- Spoof detection adds to security and reduces the convenience level otherwise available without spoof detection.
- Vendor performance metrics should include spoof detection if offered.



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our website: ibia.org