Biometrics: an overview and the key issues from the legal perspective

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I. INTRODUCTION TO BIOMETRICS

WHAT IS 'BIOMETRICS'?

1. **Characteristic**: The measurement of (i) psychological or (ii) behavioural characteristics of an individual, for use in proving their identity.

2. **Process**: The automated method of recognizing an individual based on measurable characteristics.

How does a biometric system work?

1. Sensor

2. Biometric Template

3. Data storage Components

4. Matching Algorithm

5. Decision Process

Practical uses of biometric technology

1) Logical access – information and assets

2) Physical Access – facility or location

Verification Versus Identification

Verification systems compares sample to previously submitted templates.

1 = 1

Identification systems try to determine who the individual is by comparing to a closed set or open set of data.

1 = multiple

Characteristics Biometric Elements:

- Universality

- Uniqueness

- Permanence

- Accessibility and ability to be quantified

Common Characteristics of Biometric Recognition Systems

-System Performance (error rates)

-User Tolerance

-Robustness

-Interface Ability
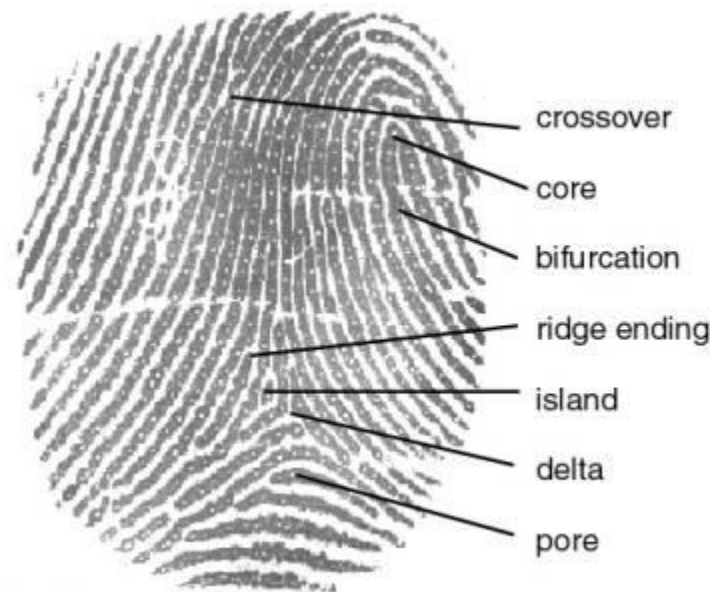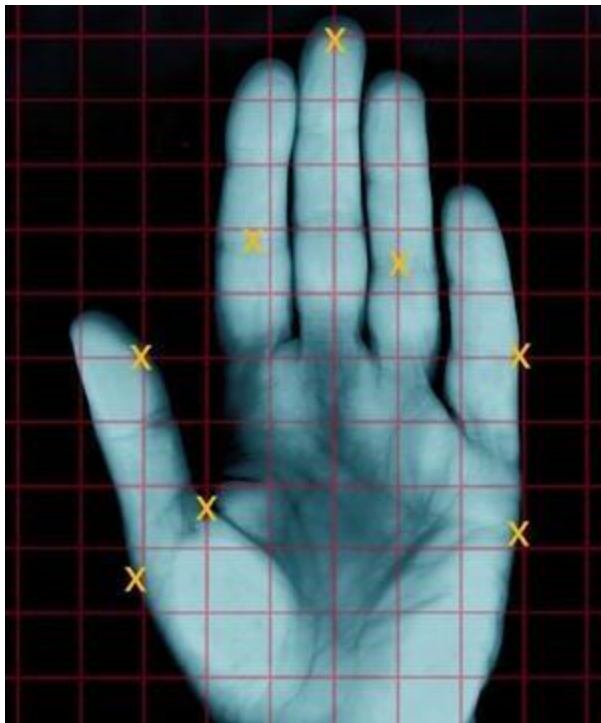
Fingerprint recognition

Figure 1

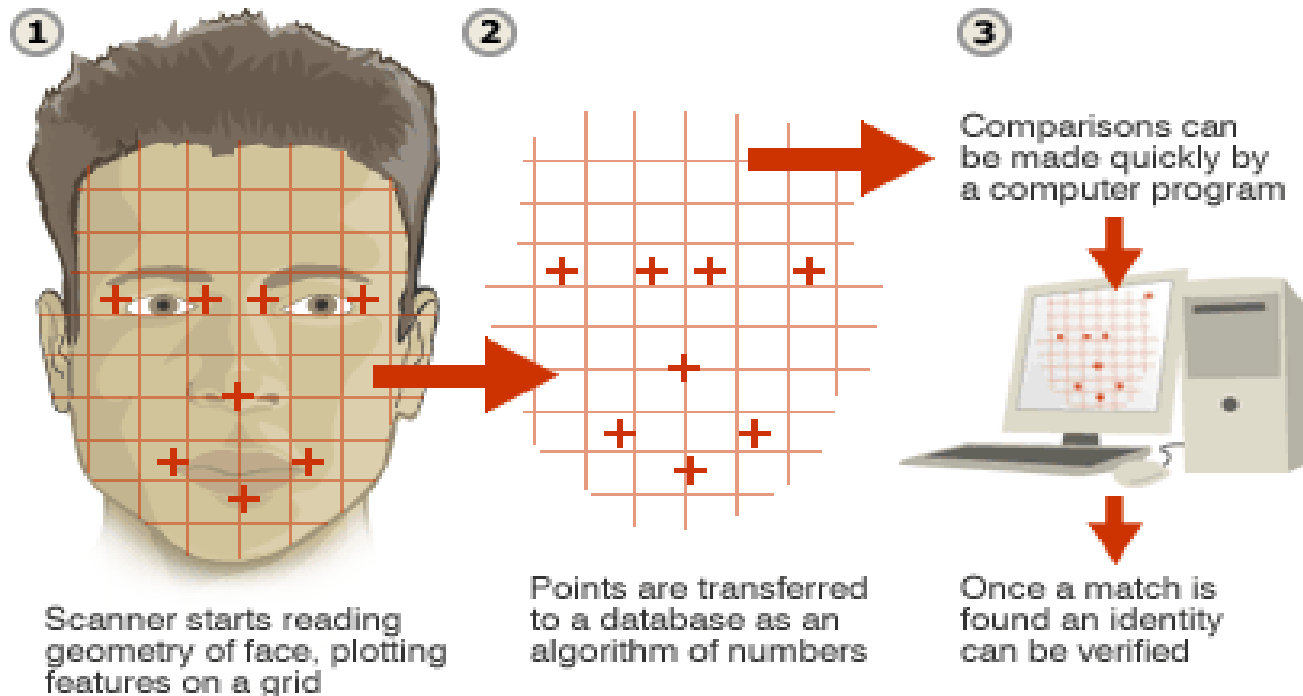http://www.biometricsinfo.org/images/finger3.jpg

Hand and Finger Geometry

http://www.theage.com.au/news/national/schools-to-fingerprint-students-for-security/2007/09/01/1188067438565.html

http://www.sandiacontrolsystems.com/img/HGU.jpg

Face Recognition

HOW 2D FACIAL SCANNERS RECORD IDENTITIES
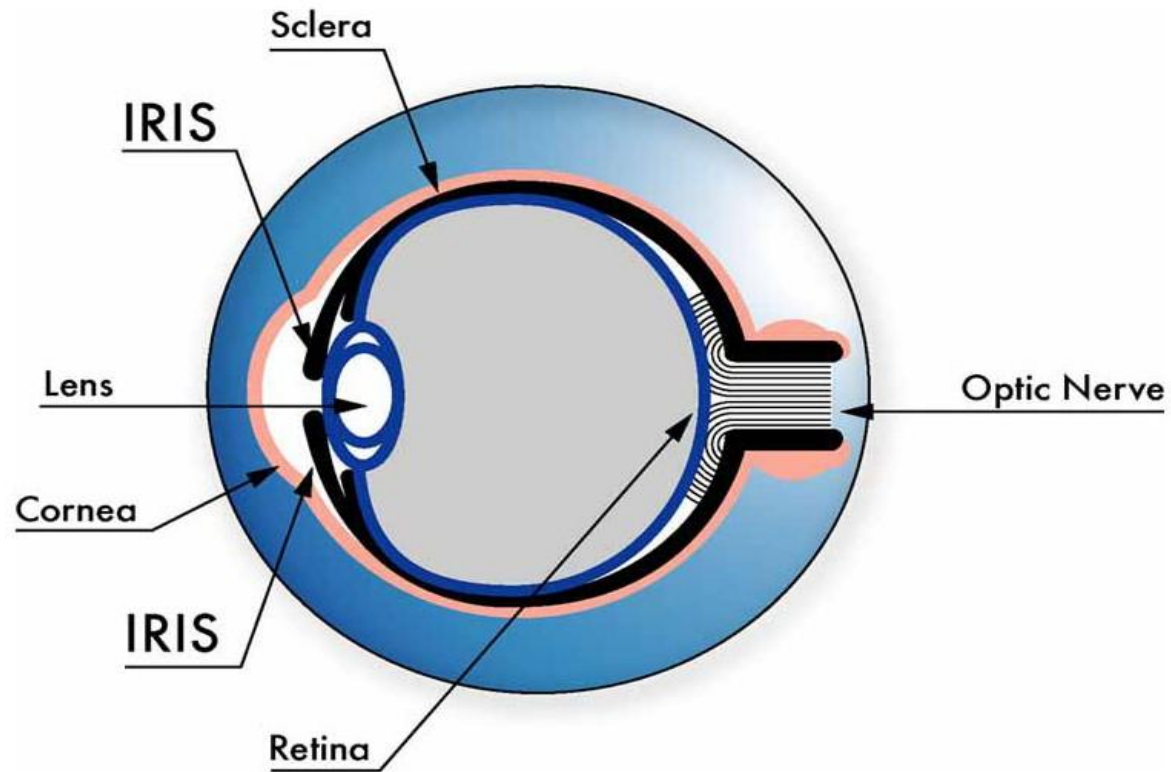
1. Scanner starts reading geometry of face, plotting features on a grid

2. Points are transferred to a database as an algorithm of numbers

Comparisons can be made quickly by a computer program

3. Once a match is found an identity can be verified

http://news.bbc.co.uk/2/shared/spl/hi/guides/456900/456993/html/nn2page1.stm

Speaker Recognition

http://www.acm.org/crossroads/xrds3-3/gfx/sound.jpg

Iris Recognition

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Iris Recognition

http://www.cl.cam.ac.uk/~jgd1000/iriscollage.jpg

Biometric Passports

http://www.scienceprog.com/wp-content/uploads/RFID/e-passport.JPG
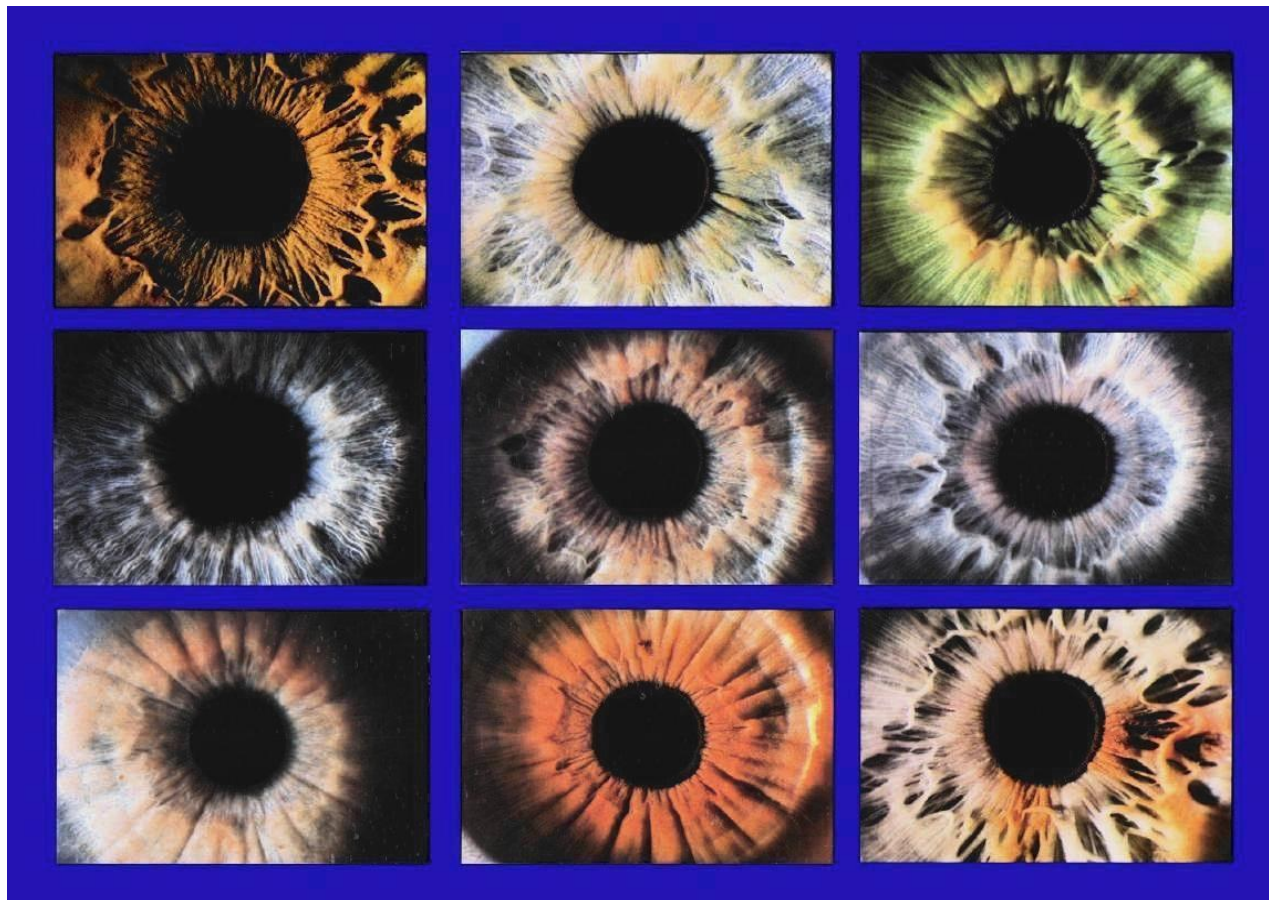
Developing biometric technologies

- Dynamic signature

- Keystroke dynamics

- Circulatory recognition

- Gait/body recognition

- Facial thermography

- DNA recognition ?

- Etc.

Current Uses in the Market

Government uses:
- E-passports
- National Security
- Transportation: Airport/airline travel
- Immigration
- Information Security

Private sector uses:
- Hardware
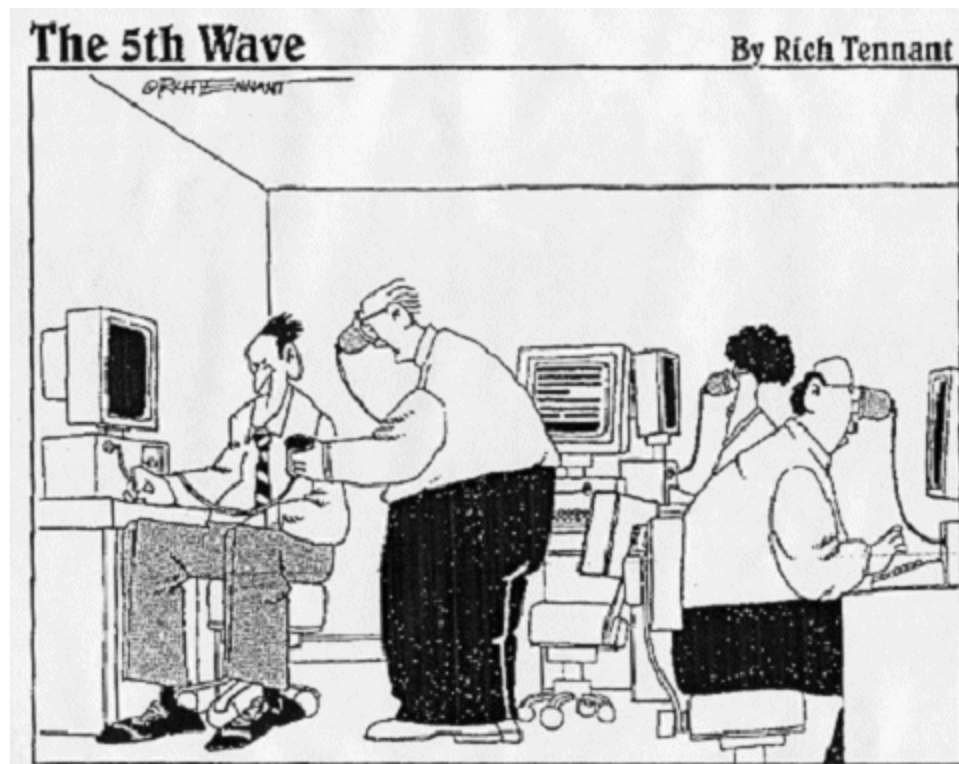- Information Security
- Domestic Uses
- Health care
- HR Purposes
- Assets

II. BIOMETRICS AND EUROPEAN PRIVACY

European Context

- Right to data protection

- Right to privacy

- Human right approach

Biometrics and Human Rights

The 5th Wave — By Rich Tennant

"C'mon Brickman, you know as well as I do that 'nose scanning' is our best defense against unauthorized access to personal files."

Generic Concerns Article 29 Working Party

- Special sensitivity biometric data :
  - behavioural and physiological characteristics of an individual
  - Unique identification
- Potential re-use (both private and public sector actors)
- Potential desensitization

Purpose and Proportionality

- Impact on legitimacy of biometric process used in a specific context (e.g. Storage of reference information; raw data may contain unnecessary information)

- Affected population (in terms of quantity and quality)

- Public sector uses v. Private sector uses

Other Issues

- Fair collection and information

- Criteria for making data processing legitimate

- Prior Checking – notification requirements

- Security measures

- Sensitive data

- Unique identifier

Interpretations by member state DPAs

- No harmonized approach (country by country)

- Gradually but slowly more acceptance of biometrics technology

- Factors:

  - DPAs tend to be sceptical about storing templates in a central database

  - DPAs promote the use of biometric applications that do not "leave traces"

  - DPA are more lenient towards public sector purposes (private sector purposes typically require stronger justification)

Potential Bottlenecks For Companies

- Biometrics technology industry
- Users of biometrics technology

III. OTHER LEGAL ISSUES

A. BIOMETRICS IN THE WORKPLACE

B. E-COMMERCE AND CONTRACTS

C. POSSIBLE CONTRACTUAL ISSUES

D. EVIDENCE

E. STANDARDIZATION

A. Biometrics in the workplace

http://pagesperso-orange.fr/fingerchip/biometrics/fun/security4.gif

Biometrics in the workplace (continued)

- Need for employer to secure premises and IT Network (physical and logical access control)

- Monitoring of employees (e.g. prevention of 'buddy punching')

Biometrics in the workplace (continued)

- <u>Privacy Issues</u>:
  - Legitimacy of specific use of biometrics
  - Biometric information stored in central database or on individual carriers (e.g. badge)?
  - Are some biometric data to be considered as sensitive data (containing information on race, health,...)?

- <u>Consultation Issues</u>
  - Introduction of biometric system may have impact on the work organisation and the privacy of employees
  - Involvement of employee representative bodies

B. Biometrics and E-commerce

Ability to identify the purchaser?

- Better than passwords

Industry is slow to embrace biometric technology

Costs

- Non-portability of devices

➢ Alternatives such as keystroke dynamics and speaker recognition could solve these issues.

Biometrics and E-commerce continued

C. Possible Contractual Issues

1. Liability

2. Malfunctions and technical problems

D. Evidence

http://aftermathnews.files.wordpress.com/2008/08/biometric_passport.jpg

Outstanding problems with biometrics as evidence:

1. Lack of harmonization

2. Advantages and disadvantages experts

3. Right to counter-expertise

4. Rights of second experts

E. Standardization

•National and International efforts for standardization of biometrics and biometric systems

•International Standardizing Organization in cooperation with the International Electro-technical Commission publishes standards

•Importance of interoperability of systems

IV. CONCLUDING REMARKS AND QUESTIONS

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