



CROSSMATCH
TECHNOLOGIES

Protecting People, Property and Privacy

How will electronic passports, electronic ID documents and electronic visa change our world?

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By the way: This means, how they change OUR world as technology providers

- Standards
- Biometrics
- Interoperability & data quality
- Multi-Biometrics & fusion
- Ergonomics & acceptance
- Applications

- Biometrics
 - ISO 19794-x
 - BioAPI
 - Tested compliance
 - Image quality: informative annex of ISO 19794-4 is copied from FBI EFTS/F
 - FBI EFTS fingerprint device certification
 - German BSI also certifies single finger and tenprint devices
- RFID
 - ISO 7816-x, ISO 14443-x
- MRTD
 - ICAO Doc 9303 (ISO 7501)
 - Supplement & technical reports (testing of passports and readers)
- Financial sector
 - ISO 19092:2008 Financial Services – Biometrics – Security framework
- Other sectors?



- Finger, face & iris are the most common biometric modalities today
- The introduction of electronic passports, electronic ID cards and multinational visa systems prepares the market for other biometric applications in all fields:
 - access control, home comfort, orders via phone, ATM, cars, travel, hotel, car rental etc.
- Other modalities will follow:
 - Voice (speaker detection), vein pattern, gait, signature, etc.
- Other purposes will follow:
 - Sleep detection (face), threat detection (face, voice)

RFID Interoperability

- E-Passport interoperability tests have tested RFID interoperability
 - Electronics level
 - Protocol level
- During the last few years
 - Regular cross tests of several passport samples with several readers
 - Test standards for passports and for inspection systems
- Established cooperation between most chip makers, passport and reader manufacturers
- Today RFID interoperability is reached
 - Basic Access Control (BAC) since Berlin 2006
 - Extended Access Control (EAC) since Prague 2008

Biometrics Interoperability

- Biometrics interoperability
 - Biometric exchange format interoperability
 - Biometric recognition performance
- Passports/Visa store images, not pre-processed templates
 - Extracted features (templates) would be faster, but less interoperable (acceptable for smaller/closed systems?)
- Template aging effects
 - Long validity period of ID documents without updates
 - Experiments necessary (or ask again in ten years)

Biometric Recognition Performance

- One of the largest imaginable user groups
 - All passport holders from all countries
 - Global interoperability is required
 - No proprietary technology – storage of images
- Small data pool
 - Passport: Two fingerprints, one portrait
 - Visa: Ten flat fingerprints
- Data quality is essential
 - No later updates during validity period
 - Data that is lost at capturing time is lost forever
 - High device quality ensures high throughput in verification processes
 - Care for capturing device quality
- Fake detection
 - Necessary for automated kiosk style solutions
 - Still unsolved problem. Research is necessary.

Multi-Biometrics and Fusion

- Use as much data as available
- Example: electronic passport
 - Security features of the printed document
 - Demographic data
 - Fingerprint data (from the passport and captured live)
 - Facial images (from the passport and captured live)
 - Existing databases
 - Black lists & visa databases
 - APIS (Advanced Passenger Information System) data
 - AFIS (Automated Fingerprint Information System) data
 - Travel history
- Goal: Reach high recognition performance and high throughput

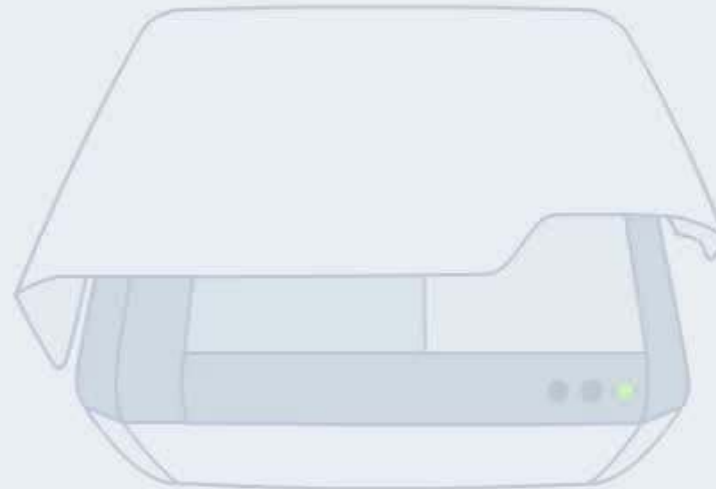
Example: Document Reader

- Ergonomics is essential:
 - For self-service applications
 - Support inspection staff
 - Optimize the throughput of inspection workflows (data reading takes time!)
 - Keep it simple: Place the document on the reader – that must be sufficient
- Intuitive usage:
 - No matter where the chips are located
 - Even inexperienced users must be able to place their ID document properly without training
 - Avoid document damage like bent or ripped pages
 - Allow reading of documents in protective covers
- Demonstrated standards compliance:
 - Ensure that all ID documents that occur at our borders can be inspected: One device for all documents



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Intuitive Usage



Example: Fingerprint Scanner

- Scanner field illumination:
 - Color matters
 - Red is associated with ceramic stove top: Caution, hot!
 - Green is associated with safety
 - No illumination or white illumination is often recognized as lack of guidance
- Scanner placement:
 - Non-detachable mounting is demolition proof, but hard to use for disabled and shorter people
 - Height adjustable mounting is more expensive, but much more comfortable
 - Detachable equipment can be used by wheelchair users much easier
- User guidance:
 - Guidance without media break
 - Signaling next to the scanning device
 - Intuitive pictograms and other appropriate signals

- RFID interoperable readers are available
- Biometric systems today can be used for large scale interoperable applications. Standards are applicable.
- Enrollment data quality is most important:
Garbage in = Garbage out!
- New technology needs newly designed processes:
Ergonomics is essential!
- The government driven applications will be followed by a variety of civil applications, opening a new high volume market for convenience and security products.

Applications

AIRPORTS



BANKS



HOTELS



BORDER CONTROL



POLICE



MOBILE COMMUNICATIONS



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Thank you very much for your attention.

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