FastPass

How to balance the eternal triangle (security, usability, privacy) in automated border control ?

2016 Security Printers, International Conference & Exhibition

Presented by
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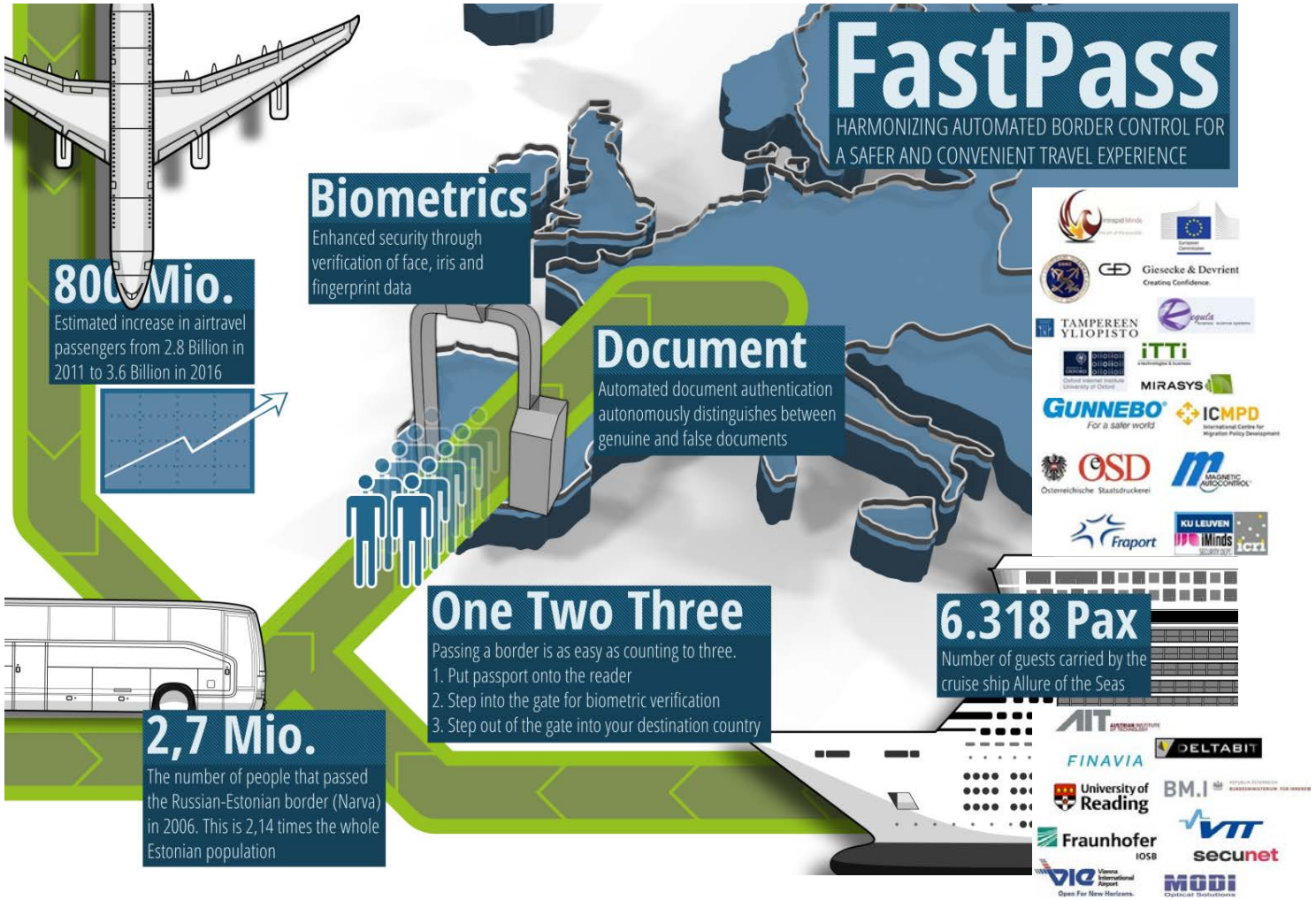
The work has been supported by the FastPass project. The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 312583.

FastPass – The Project



Goal

- **Harmonised, modular reference system for ABC**
- **User-centric approach**

Details

- **EU FP7 Security**
- **Jan 2013 – Dec 2016**
- **27 Partners, led by AIT**

Challenges

- **Security (Spoofing, Attacks)**
- **Acceptability**
- **Harmonization**

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FastPass Objectives

Supporting Innovative Border Crossing Concepts

- **Airborder:** Comparison of classical method with kiosk biometric token
- **Landborder:** Process with/without registration
- **Cruise ship:** Enhance nominal list with biometric information

Architecture Based on Innovative Technologies

- Reference Architecture with open interfaces
- Advanced Technology Modules (Passport, Identifcation, Video Surveillance)
- Security evaluation

Integration with EES and RTP

- Extend usability to TCN
- Evaluate the value of RTP for EU citizens

Harmonized ABC Systems

- Usage of passport scanners
- Usage of kiosks
- Instaneous „Go Through“
- Process harmoni-zation

European cooperation

- Liason with commission, EP, Frontex, eu-LISA, FRA
- Liason with other European Research Projects
- Liason with industry
- Liason with BG authorities

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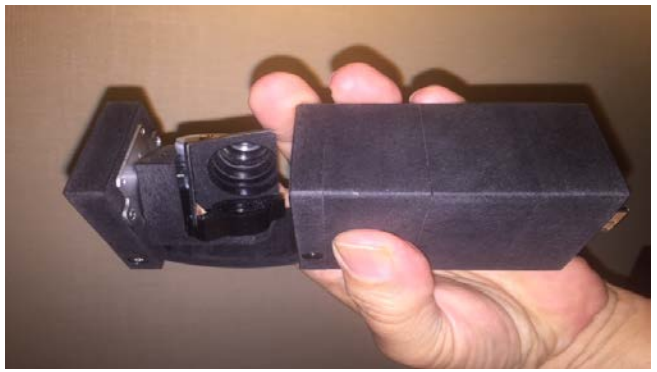
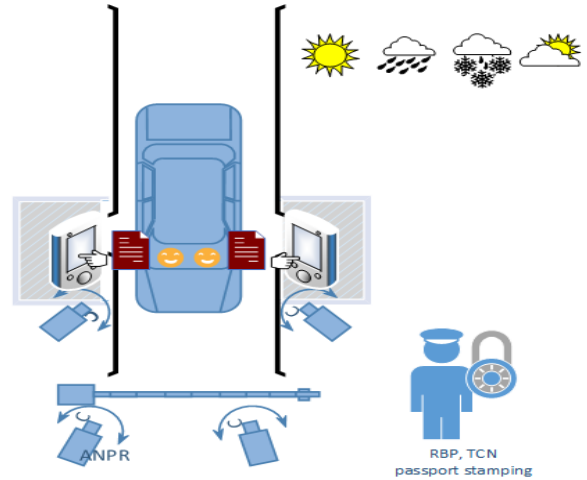
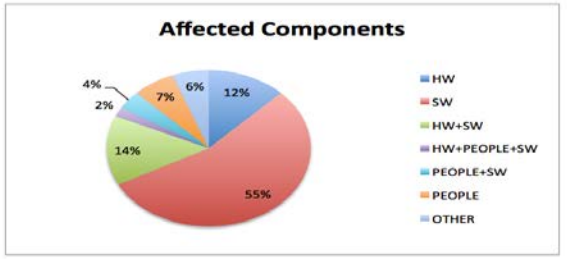
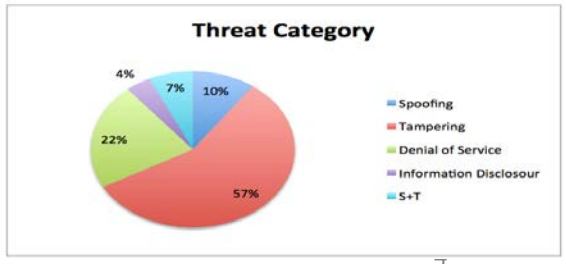
Main achievements

- **Next-generation sensor development and novel frameworks, software and algorithms**
  - On-the-move biometric identification, speed, quality, reduced intrusiveness, counter spoofing and costs
  - Document scanner interoperability
- **Innovative scenarios based on harmonized architectures**
  - Several air border scenarios, cruise-ship scenario, land border scenario with travellers remaining in the cars
- **Methodology for a holistic risk and security assessment**
  - List of threats, with type, impact, exploitability and mitigation strategy









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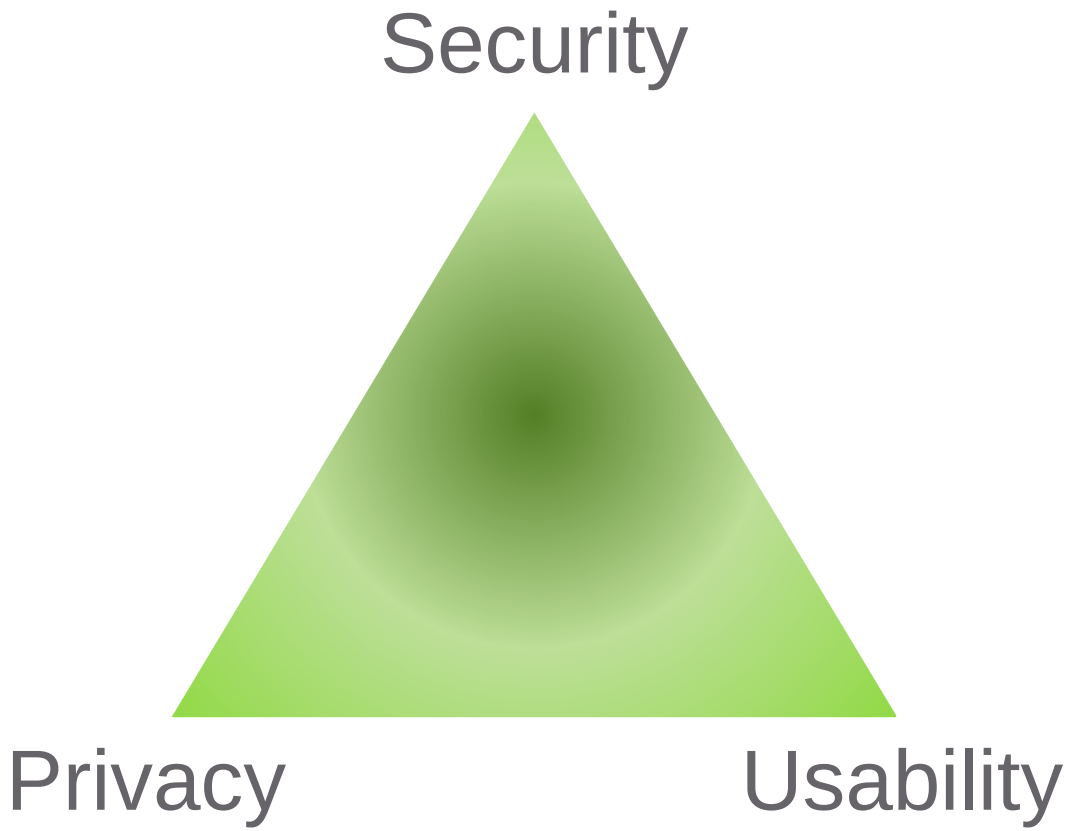
The triangle

- Security – Securing borders against
  - Illegal immigration, trafficking human beings, terrorism, severe crime
- Privacy
  - Fully respect to human dignity, respectful manner, proportionate (SBC)
- Usability
  - Efficient border crossing, facilitation of travels



Influence of applied technologies

- Documents
- Biometric features
- User Interaction
- Hardware
- Infrastructure
- Software/Process

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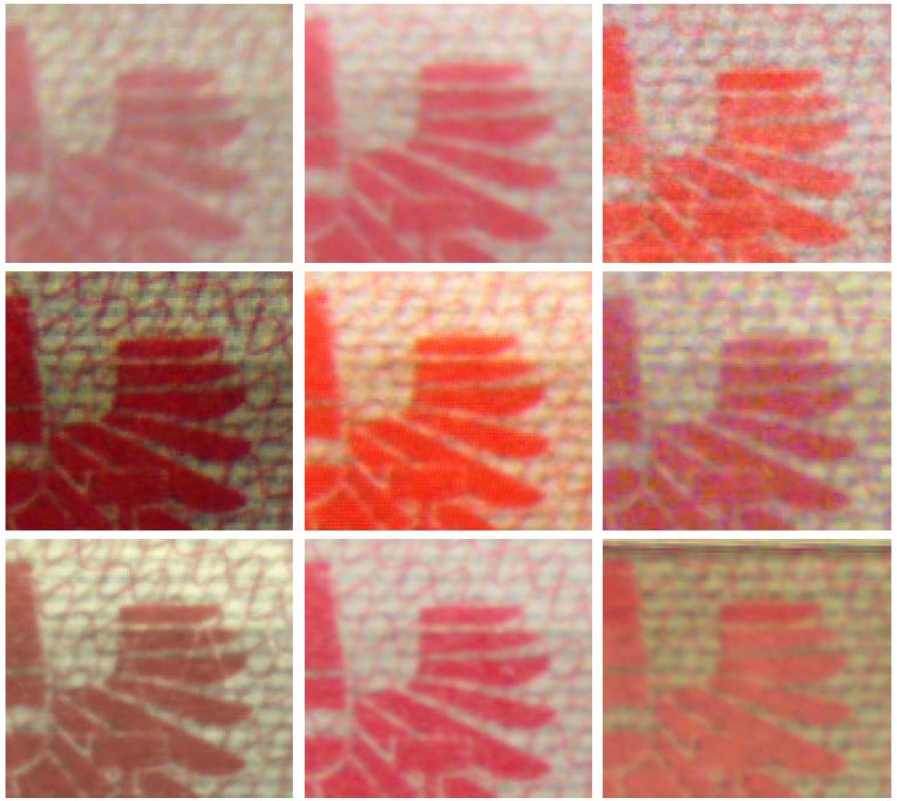
Document scanning

- **Document reader interoperability work**
  - Benchmarking
  - Interoperabilty
  - Testing
- **Document teacher**
  - To integrate new documents easily
  - To define own rules on documents



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Tested Devices

3M AT9000 MK2

ARH Combo Smart

ARH PRMc

Bundesdruckerei VE 600

DESKO ICON Gen I

DESKO PENTA Gen 4.0

Regula 7024m.111

Regula 7034.111

Suprema RealPass-V

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Anti-Glare

- 6 out of 9 devices featured anti-glare functionality; 3 out of 6 with consistent OVD-free images
- **Minor accordance** between glare responses of the same document.
- Ideally, **glare-free and separate reflection image(s)** are available.

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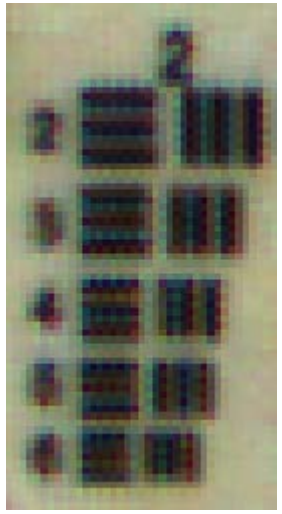
Optical Resolution

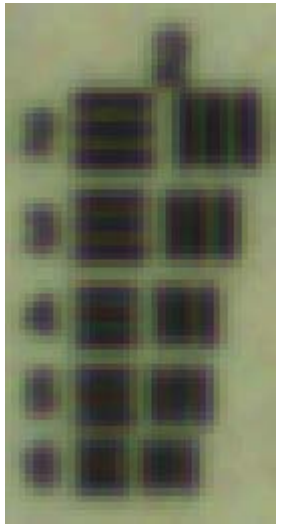
A

B

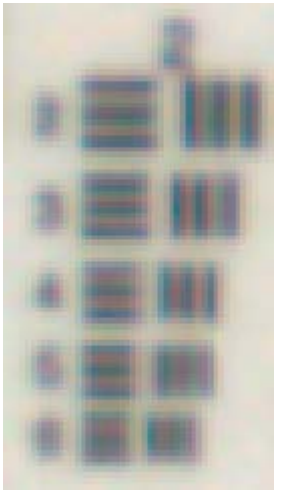


C

D



E



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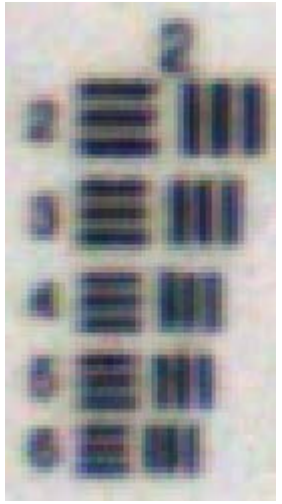

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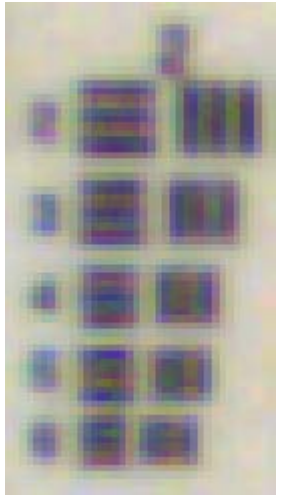
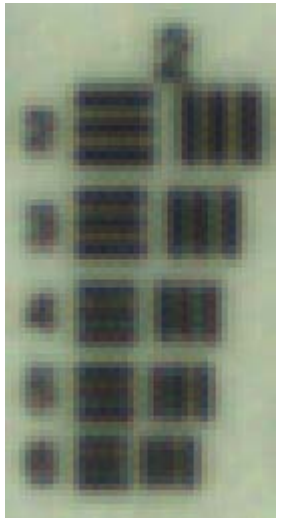
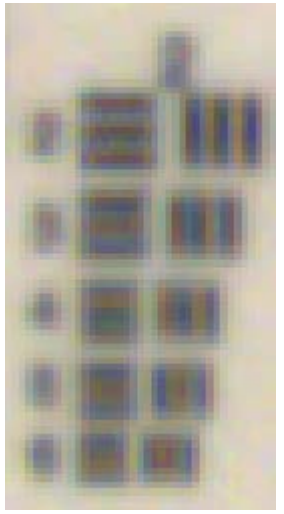
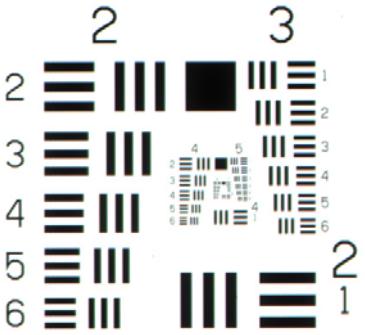


H



I





1951 USAF resolution chart

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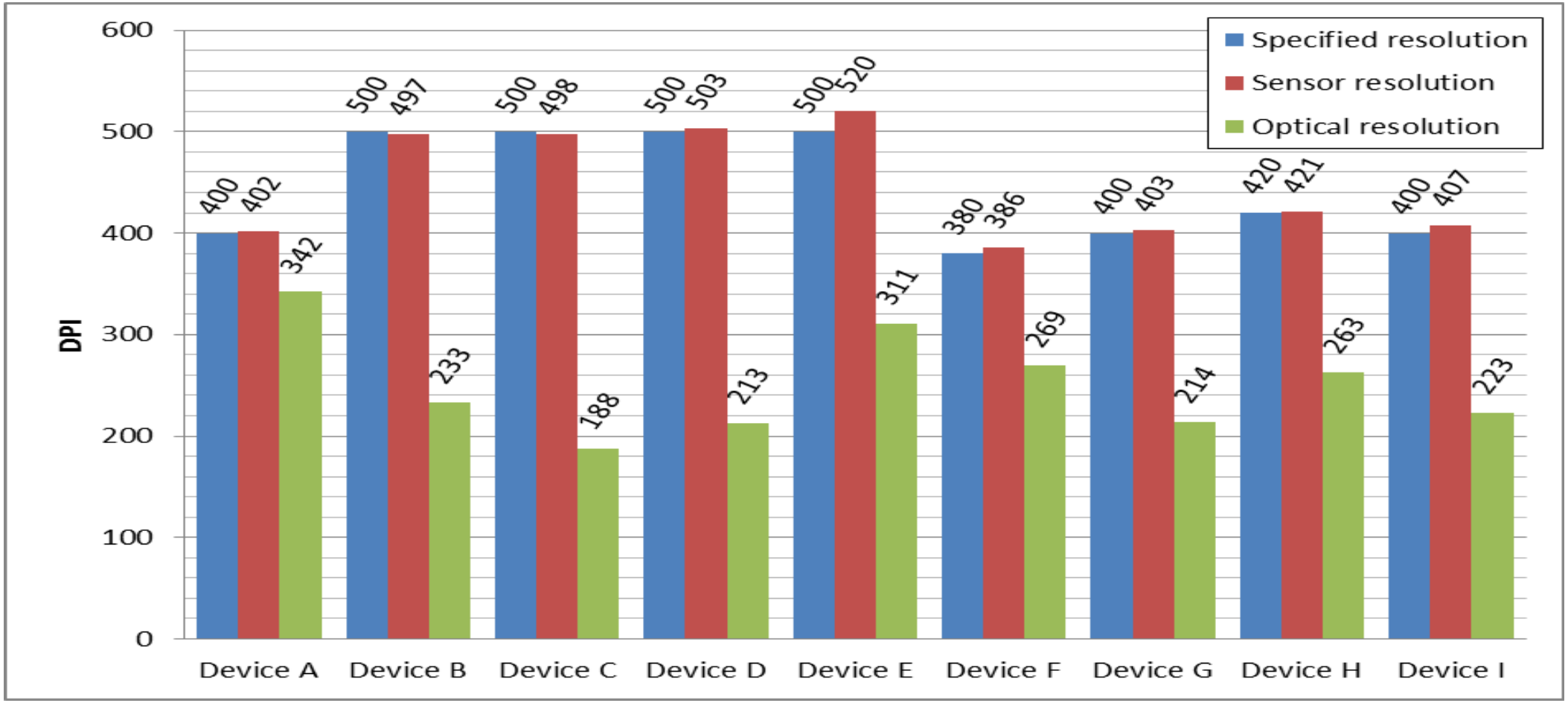
Comparison of different document/passport readers performance for optical verification



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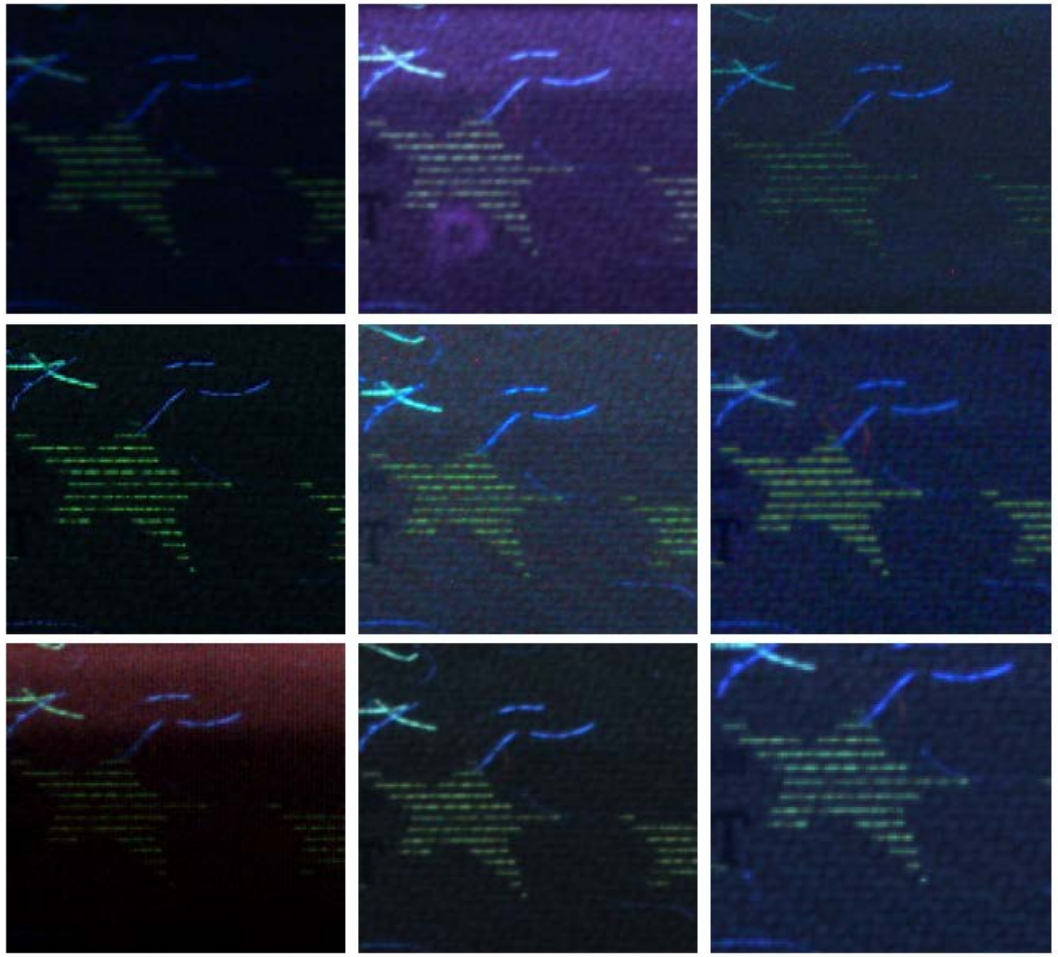
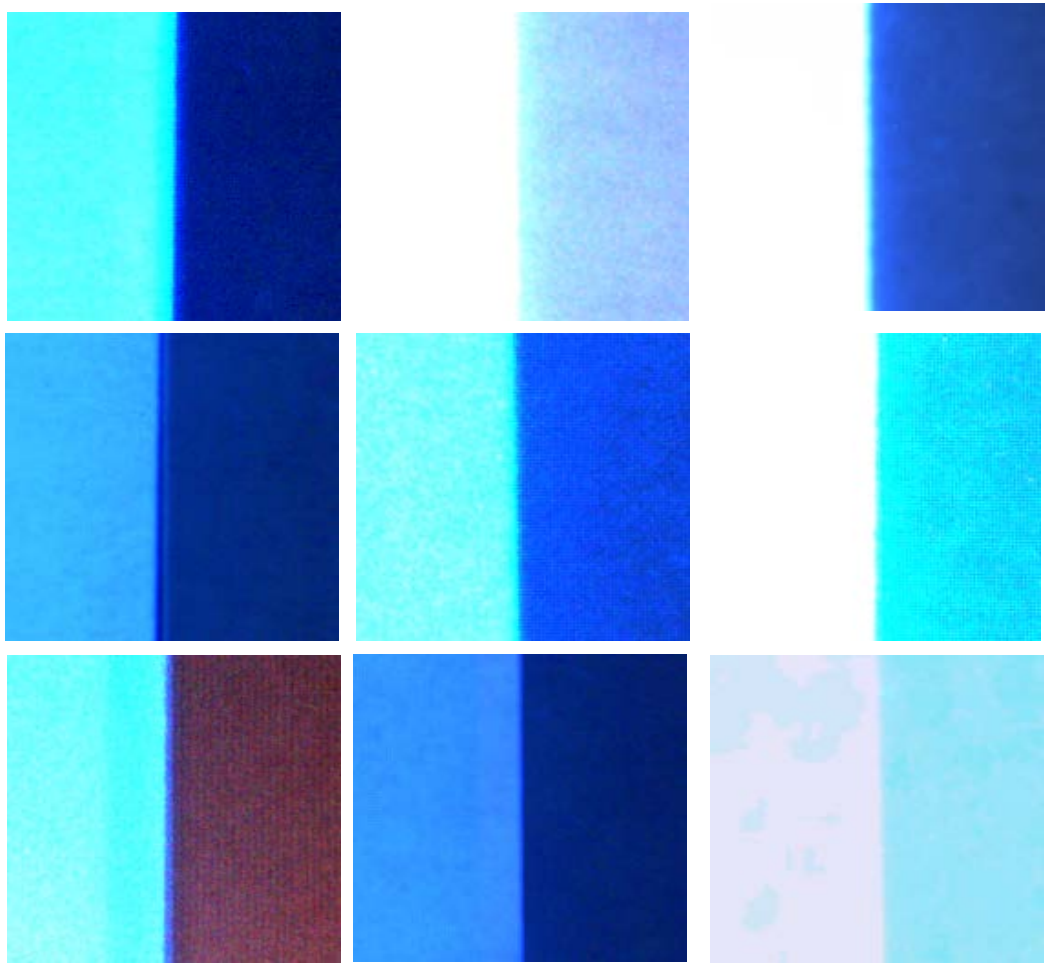
UV: Examples





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IR: Examples

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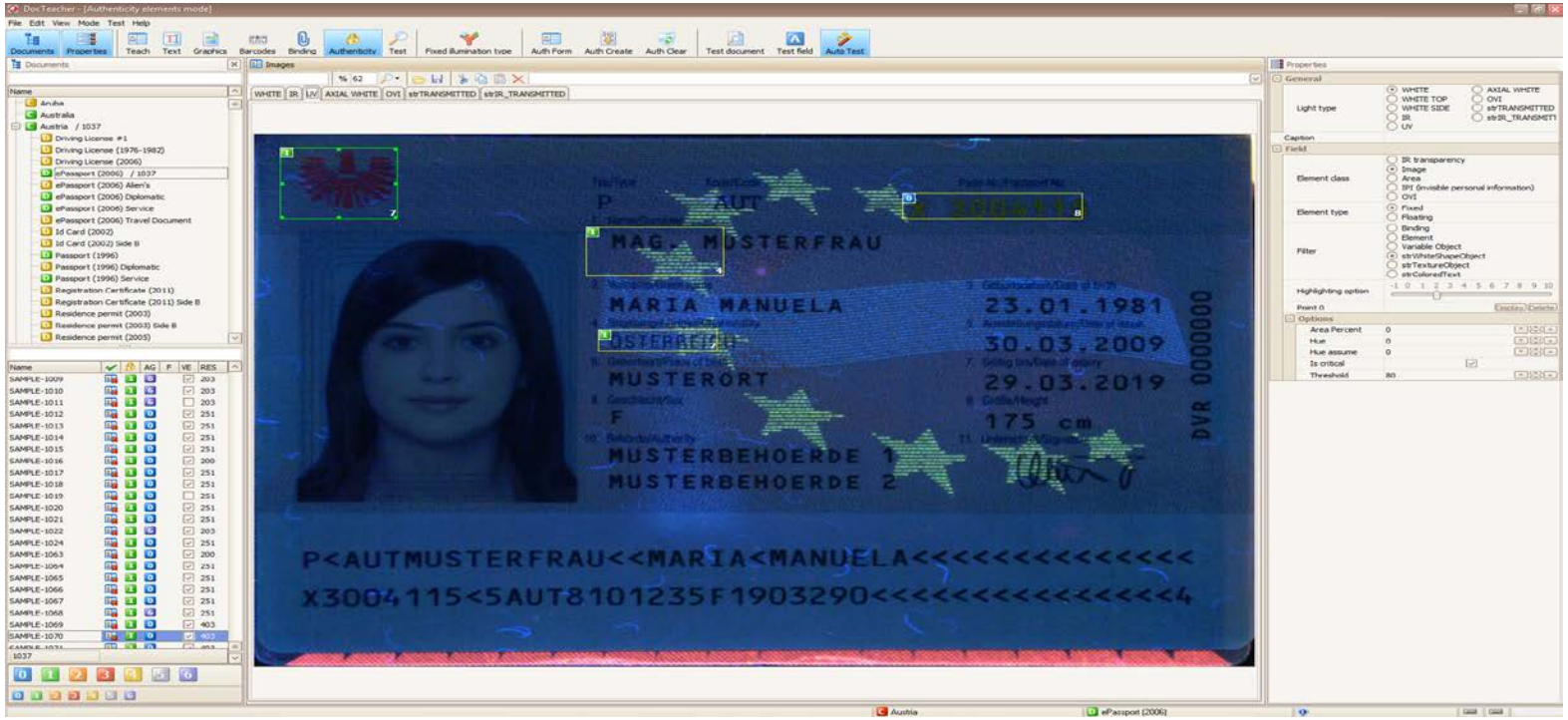
Document verification: DocTeacher

Features: Standard features (Importing, Cloning, Resizing…etc), Teaching mode, Objects editing mode, Testing mode, Batch processing.



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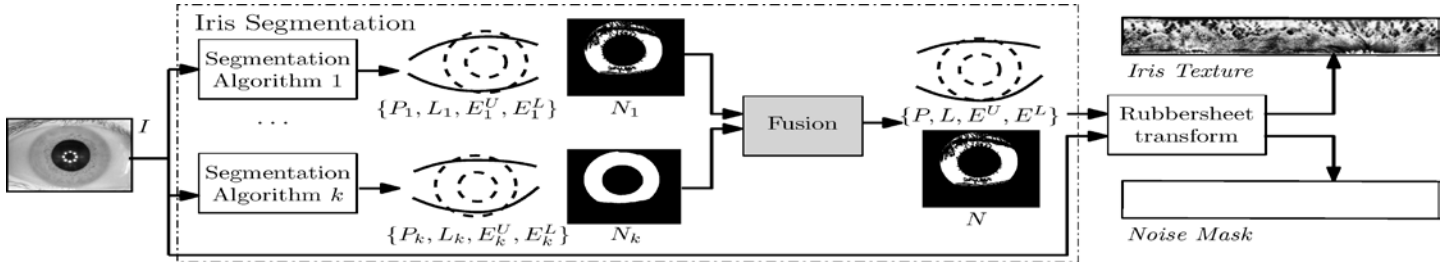
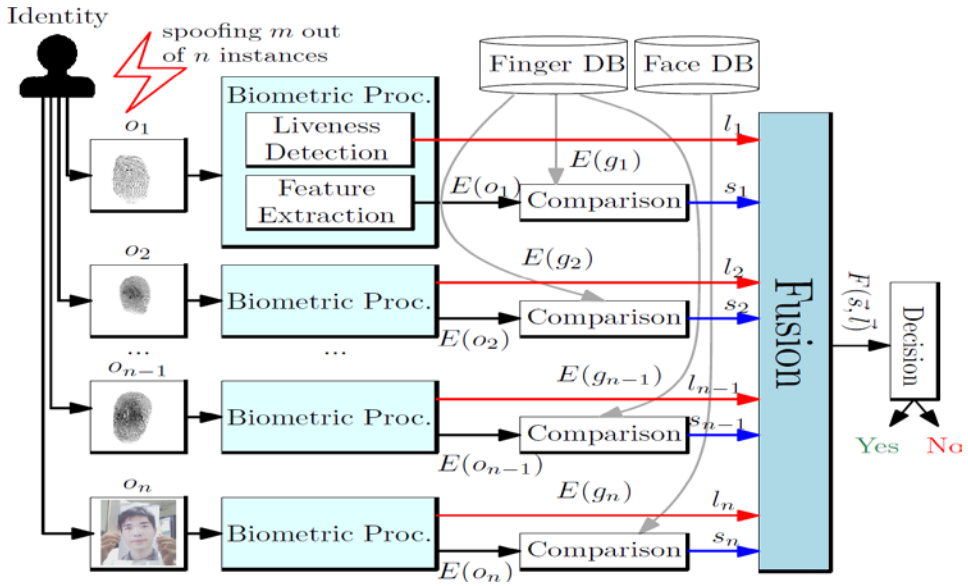
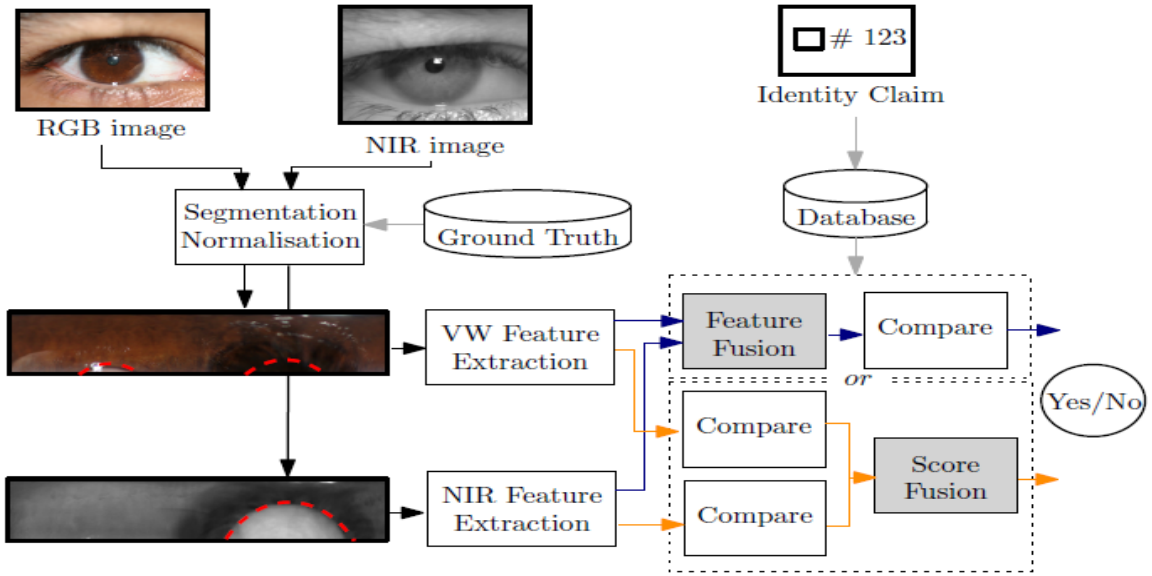
Biometrics and Video surveillance

- **Algorithms and software**
  - Segmentation for iris recognition
  - Spoofing resistent multimodal fusion
  - Multispectral iris recognition







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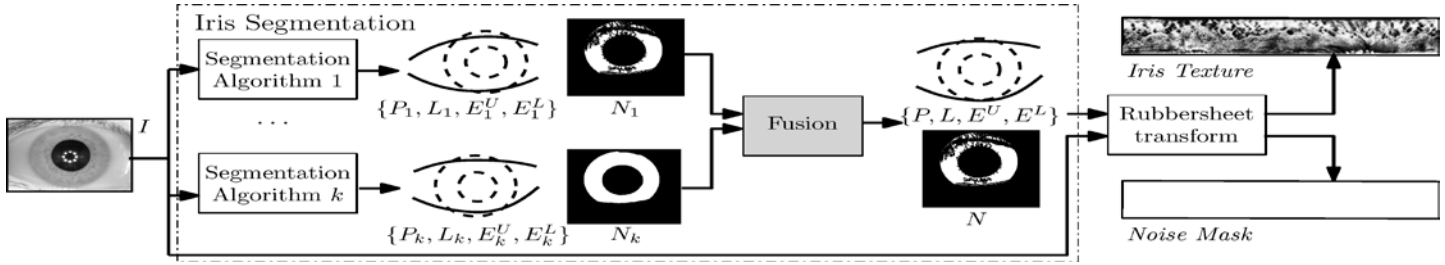

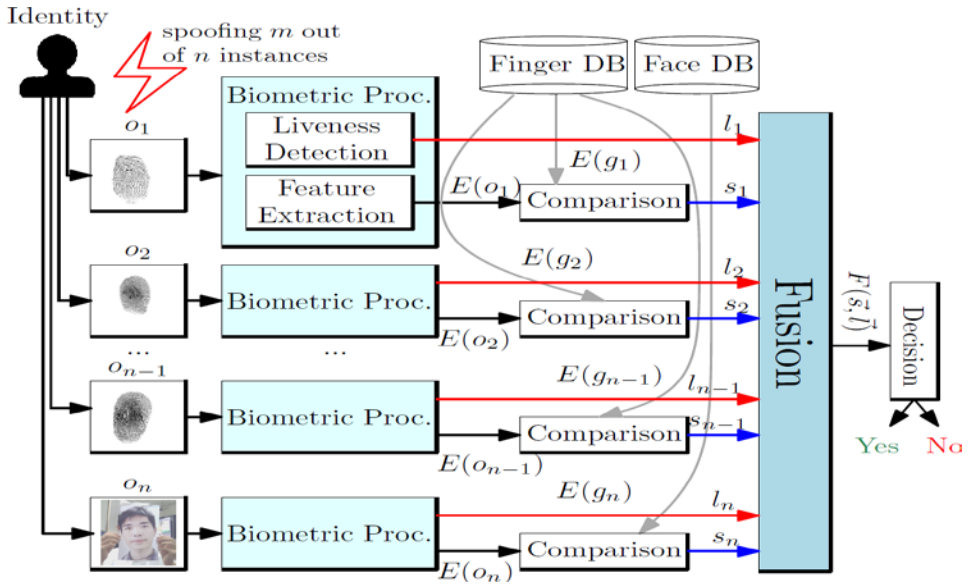

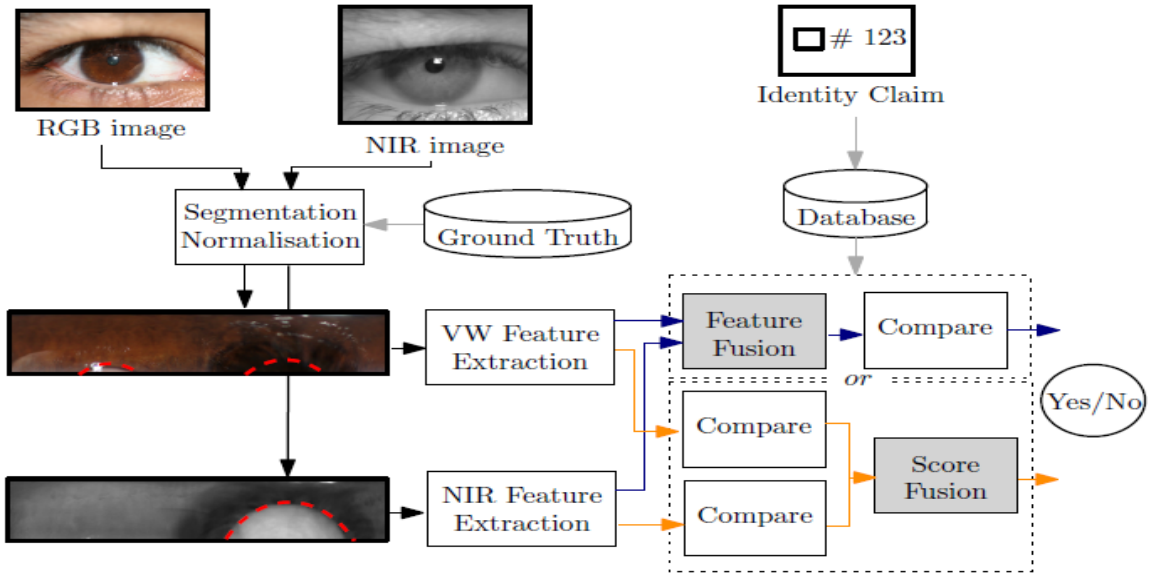

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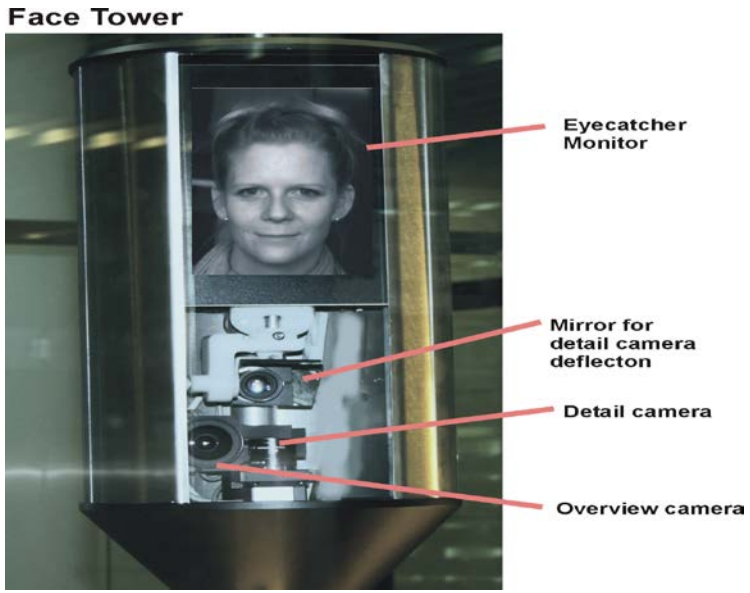
Biometrics and Video surveillance

- **Hardware and sensors**
  - On-the-move face verification
  - Iris recognition
  - Person separation
  - Left-item detection



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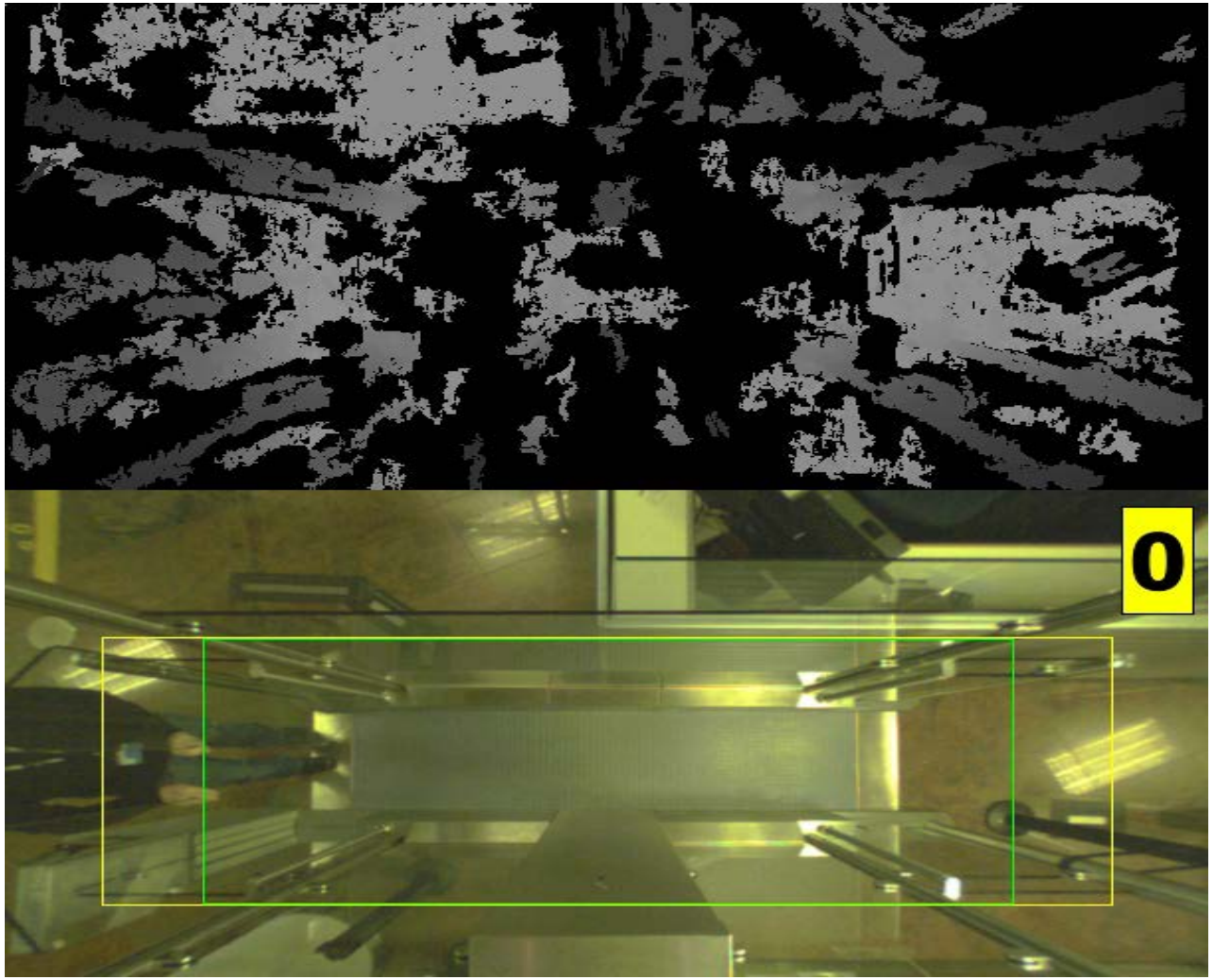
Surveillance and Protection

Example: Person separation for e-gates

E-gate test installation:
Vienna Airport, Non-Schengen-Arrivals



Video

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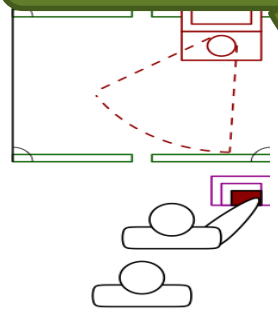
Air border

June 2015

- Classical passport reading at the eGate (slow)
- New Biometric sensor (Face)
- Different workflows tested (M1, M2)

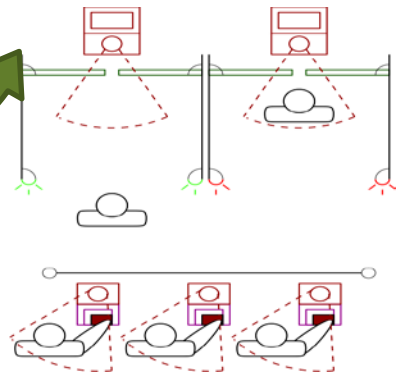
Stage 1 "Baseline Mantrap"



May 2016

Stage 2 "Segregated 2-step Kiosk"

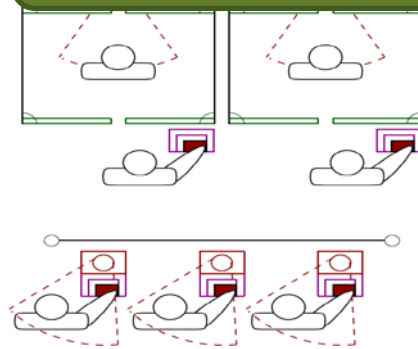
- Passport reading at the Kiosk (parallel, faster)
- Passport/Face (fast read) enable the eGate
- Passport as token, Face as token (K1, K2)



Sept 2016

- Registration at Kiosk is valid for longer period
- **Face& Iris Identification** (Update of biometric units also for continued Stage 2)
- R1 as simulation

Stage 3 "RTP with Multibiometrics"



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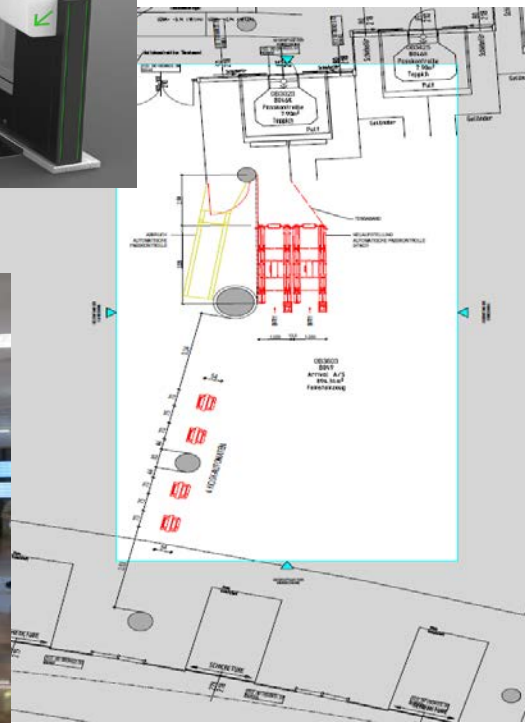
Air border

- Operational Test at Vienna Internation Airport
- Comparison of several installation types
- Documents: ePassports
- Travellers:
  - Stage 1: EU/EEA/CH
  - Stage 2 +3: + TCNVH, + TCNVE
- Biometrics:
  - Face (all Stages)
  - +Finger (Stage 2), +Iris (Stage 3)
- RTP (Stage 3) will be simulated



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Air border

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Border guard GUI (airborder)

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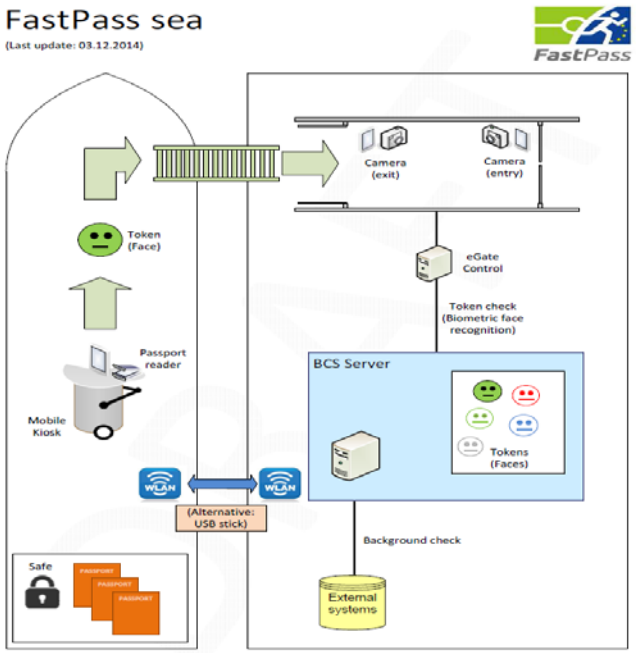
Cruise ship

- Demonstration Test at Port of Piraeus
- Document Authentication
- Passenger Authentication and Identification (1 :n)
- Documents: ePassports
- Travellers: EU/EEA/CH, TCNVH, TCNVE
- Biometrics:
  - Face (+ Iris as test)
- RTP will be simulated



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Sea border eGate

Gate in normal size

Gate folded for easy transportation

Cut-outs for Fork-lift

Design for Piraeus, 1 gate

- No mantrap
- portable

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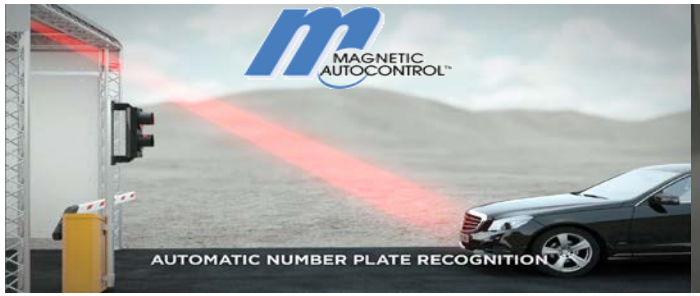
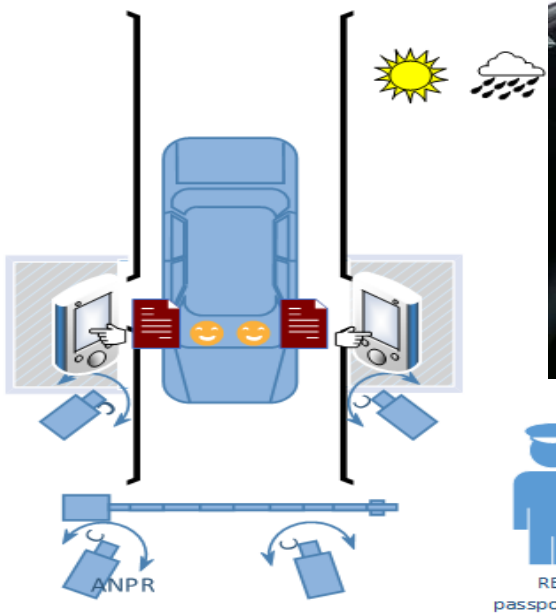
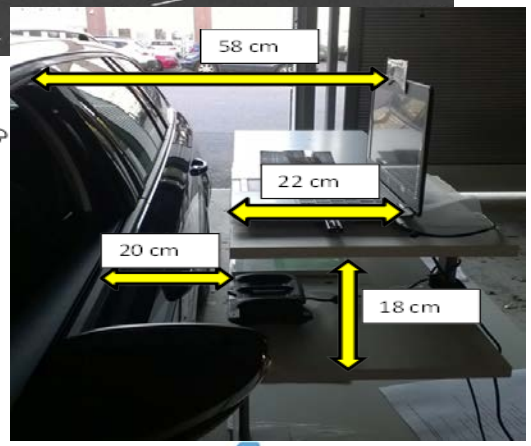
Land border

- Demonstration at Moravita
- Exit control for frequent traveller
- Enrolment of
  - ID documents
  - Vehicle documents
  - Driving license
- Moveable terminals
- ANPR to detect vehicle
- Driver and Co-driver check
- Customs check, occupancy check, stamping is done manually







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FastPass – the system/technology, that

- **…is secure**
  - Resistent
    - to latest attacks on document scanner,
    - to biometric spoofing
  - Risk Assessment, Security Assessed by dedicated methodology
- **…you like**
  - UI developed with extensive feedback from different European border guards
  - Process and procedures developed with extensive evaluation from traveller groups
  - Respects privacy and data protection (Data protection impact assessment – DPIA)
- **…is harmonized – and shows new processes and scenarios**
  - ONE reference architecture serving many processes
  - First European solution for cars at land border with ABC
  - First solution for cruise ships
  - Real comparison of different approaches on an airborder crossing point

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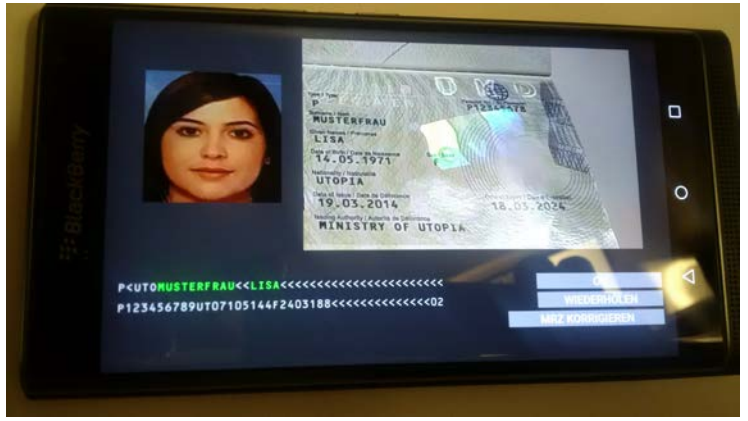
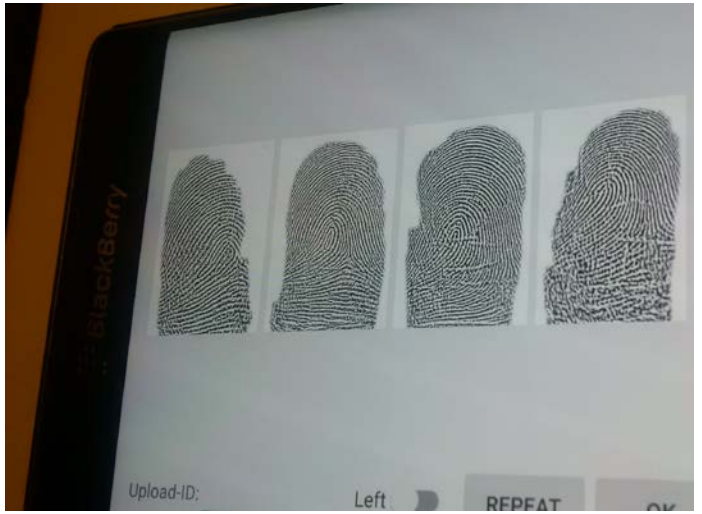
From FastPass to MobilePass to Smartphone





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Thank you for your attention!

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