



TABULA RASA - Trusted Biometrics under Spoofing Attacks

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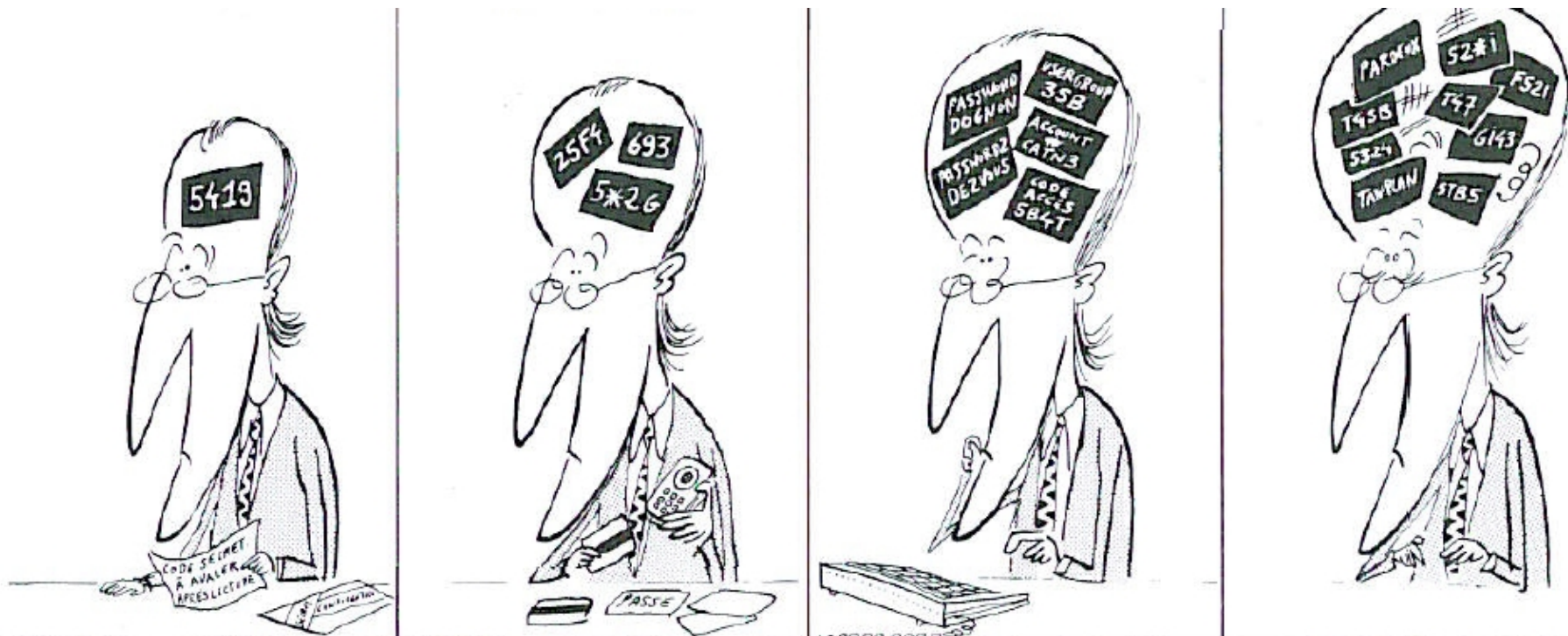
TABULA RASA

Trusted Biometrics under Spoofing Attacks





The Pain: too many passwords !



How to get rid of passwords or keys ?



Biometrics

- **Modalities:** face, voice, iris, fingerprint, vein, gait, EEG/ECG, ...
- **Research:**
 - Core biometrics: robust to noise, variabilities ...
 - Soft biometrics: age, gender, ...
 - Aging biometrics: robust in time
 - Trustworthy biometrics
- **Applications:** physical access (border control) or logical access (login, mobile biometry)



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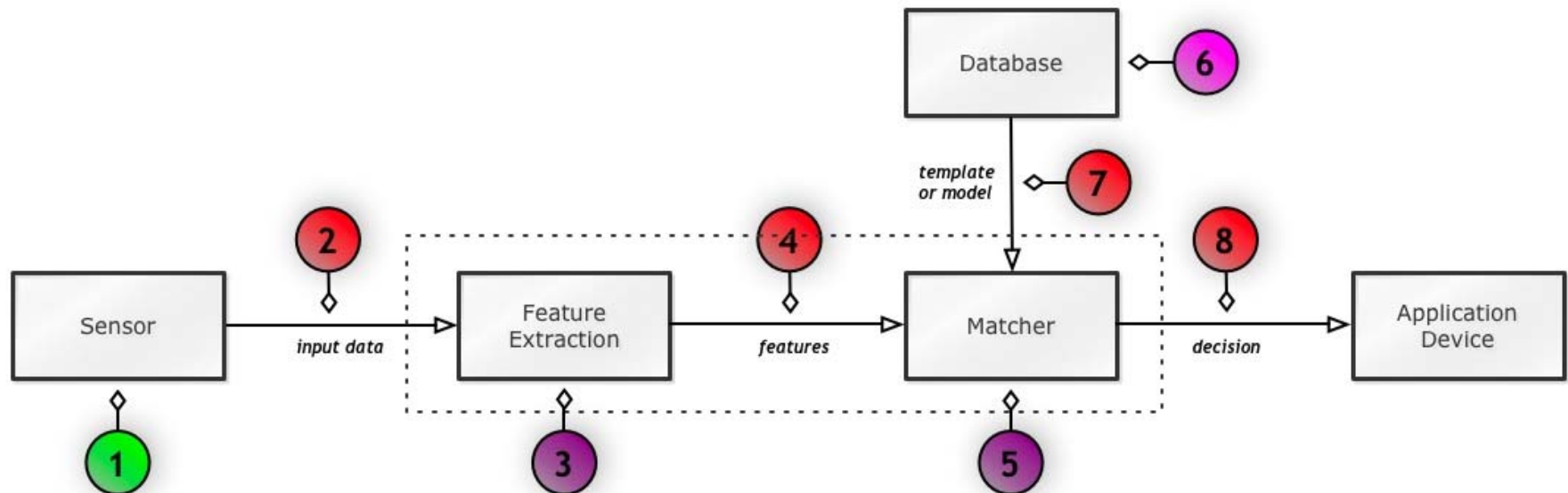
Attacks to biometric systems ?





Spoofing attacks

- Biometric systems are vulnerable to attacks:
 - Indirect attacks (intruders, hackers, ...)
 - Direct attacks (gummy fingers, photo attacks, ...) also called **spoofing**





spoofing attacks

- **Spoofing** is a major problem and a real challenge
- There is a need for efficient, reliable and scalable solutions for detecting and circumventing spoofing attacks

TABULA RASA research project:
« Trusted Biometrics under Spoofing Attacks »
(Nov 2010 – Mar 2014)





EU Funded Research (FP7)

- Research challenge 1 on Pervasive and Trustworthy Network and Service Infrastructures
- More particularly the Objective ICT-2009.1.4 “Trustworthy ICT”:
 - Technology and Tools for Trustworthy ICT
 - Trustworthy Service Infrastructures
- Also relevant to the Security theme



Partners involved

1	Idiap Research Institute	IDIAP	CH
2	University of Oulu	UOULU	FI
3	Universidad Autonoma de Madrid	UAM	SP
4	University of Southampton	USOU	UK
5	University of Cagliari	UNICA	IT
6	EURECOM	EURECOM	FR
7	Chinese Academy of Sciences	CASIA	CN
8	Starlab Barcelona S.L.	STARLAB	SP
9	Morpho (Ex-Sagem Security)	MORPHO	FR
10	KeyLemon	KEY	CH
11	BIOMETRY.com AG	BIO	CH
12	Centre for Science, Society and Citizenship	CSSC	IT



A Unique China-EU Collaboration

1	Idiap Research Institute	IDIAP	Swiss
2	University of Oulu	UOULU	Finland
3	Universidad Autonoma de Madrid	UAM	Spain
4	University of Southampton	USOU	England
5	University of Cagliari	UNICA	Italy
6	EURECOM	EURECOM	France
7	Chinese Academy of Sciences	CASIA	CN
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Expected research results

- Identification and evaluation of vulnerabilities of biometrics under spoofing attacks for
 - ICAO biometrics: face, iris and fingerprint
 - Non-ICAO biometrics: voice, gait, vein, electrophysiology

- Finding and evaluating countermeasures for spoofing attacks possibly along four directions:
 1. detecting patterns characteristic of liveness/spoofing,
 2. using dedicated sensors/hardware,
 3. using a challenge-based response (interaction),
 4. novel methods intrinsically robust to spoofing.



Main Concrete Objectives

1. to produce evaluations on the vulnerabilities of biometric systems to spoofing attacks
2. to develop and evaluate countermeasures to spoofing attacks
3. to produce databases of spoofing attacks
4. to increase the impact factor of TABULA RASA partners with conference and journal publications on spoofing
5. to submit, if possible, patents or licences on anti-spoofing techniques
6. to improve societal acceptance of biometric systems
7. to integrate anti-spoofing solutions into working systems
8. to propose standards on anti-spoofing technologies
9. to establish ethical, legal and policy implications of spoofing

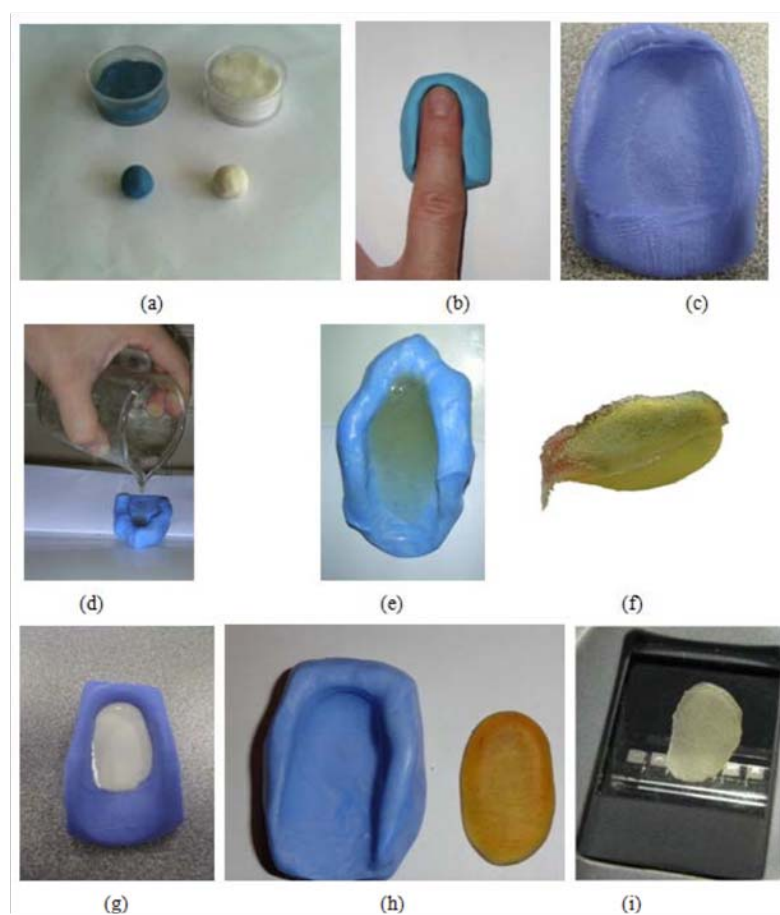
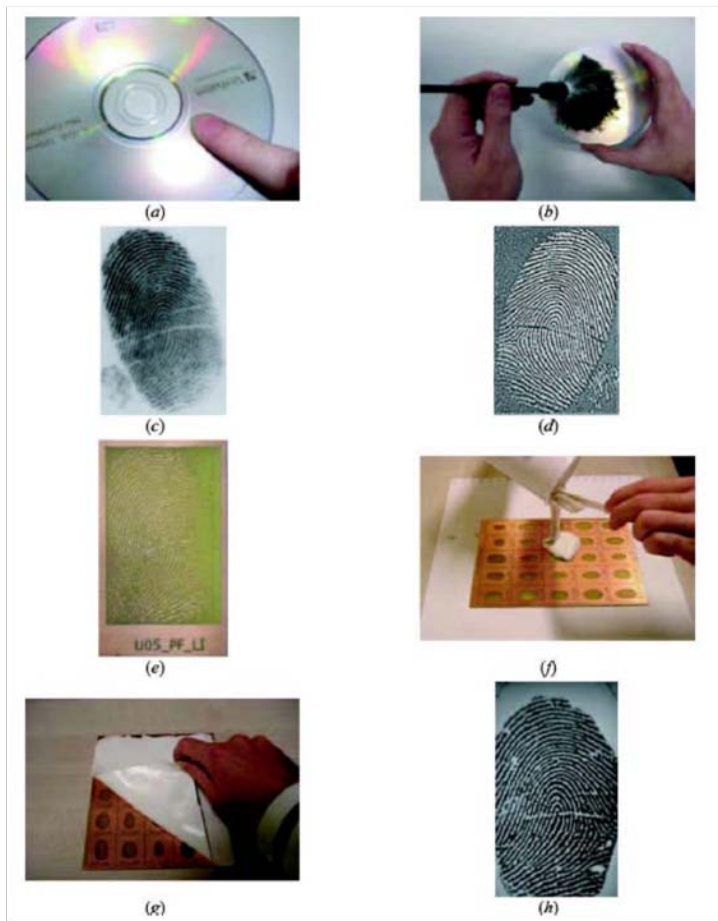


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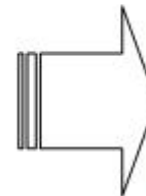
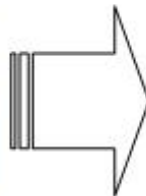


Fingerprint





Face (prints)





Face (3D masks)





Face (printed IR)



a



b



c



d



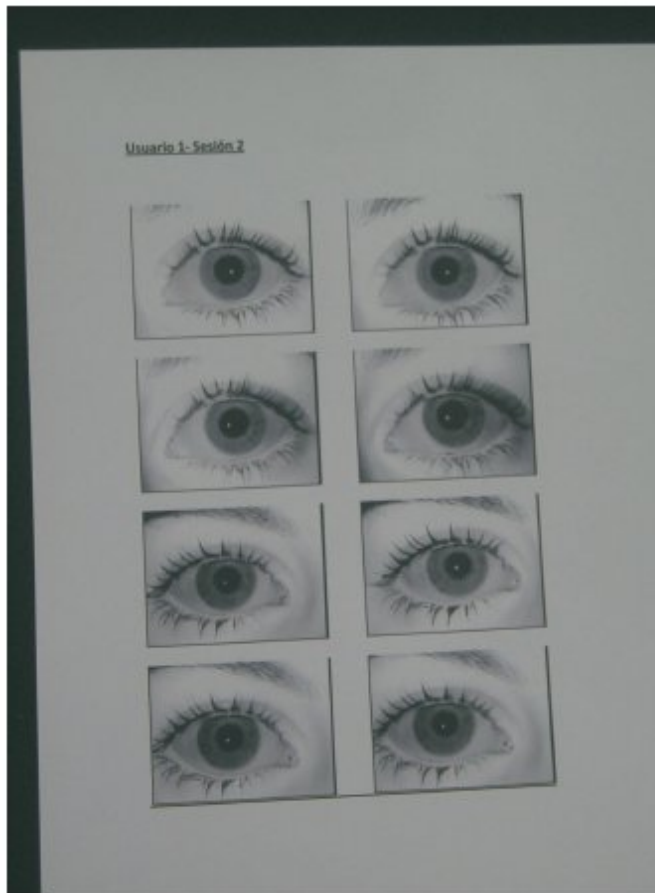
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f

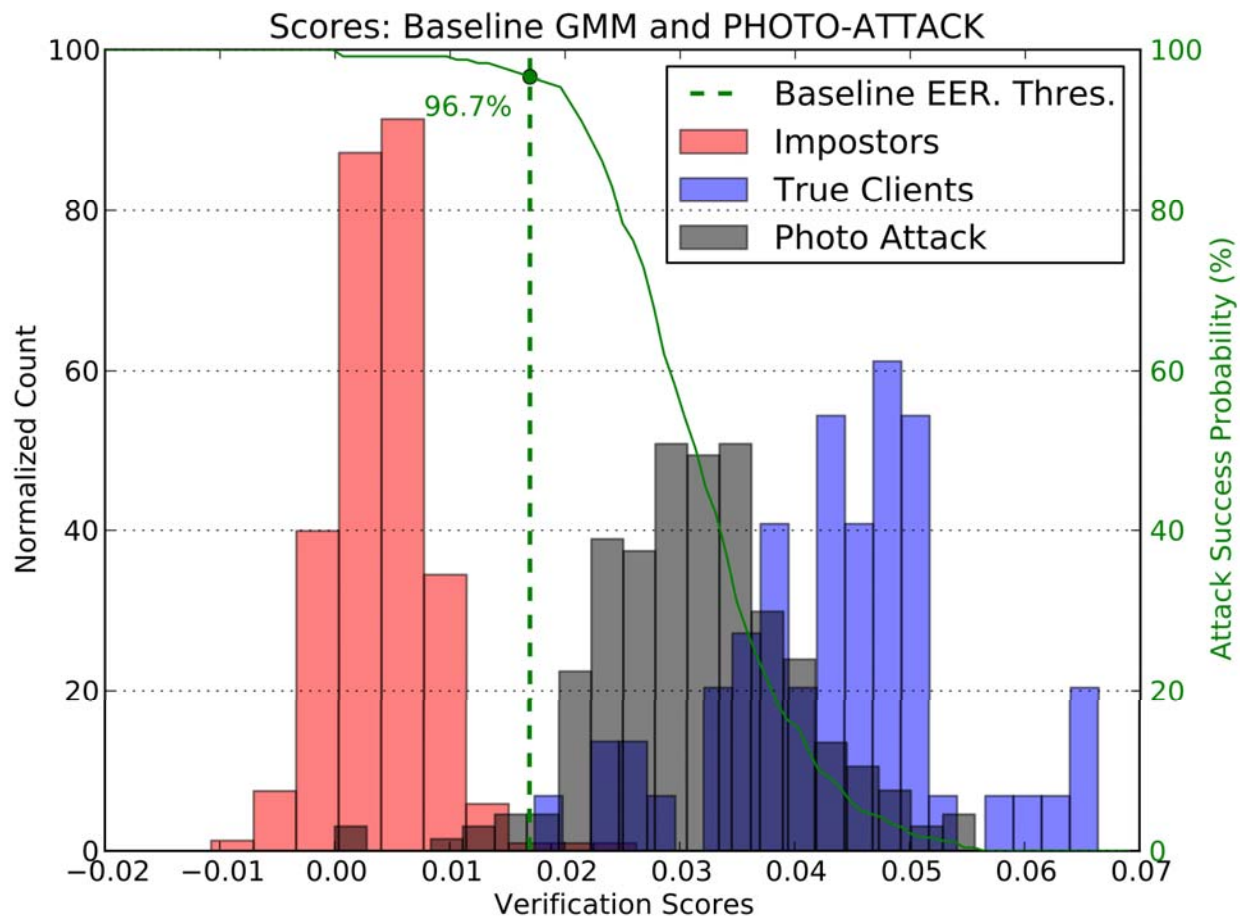


Iris (printed)



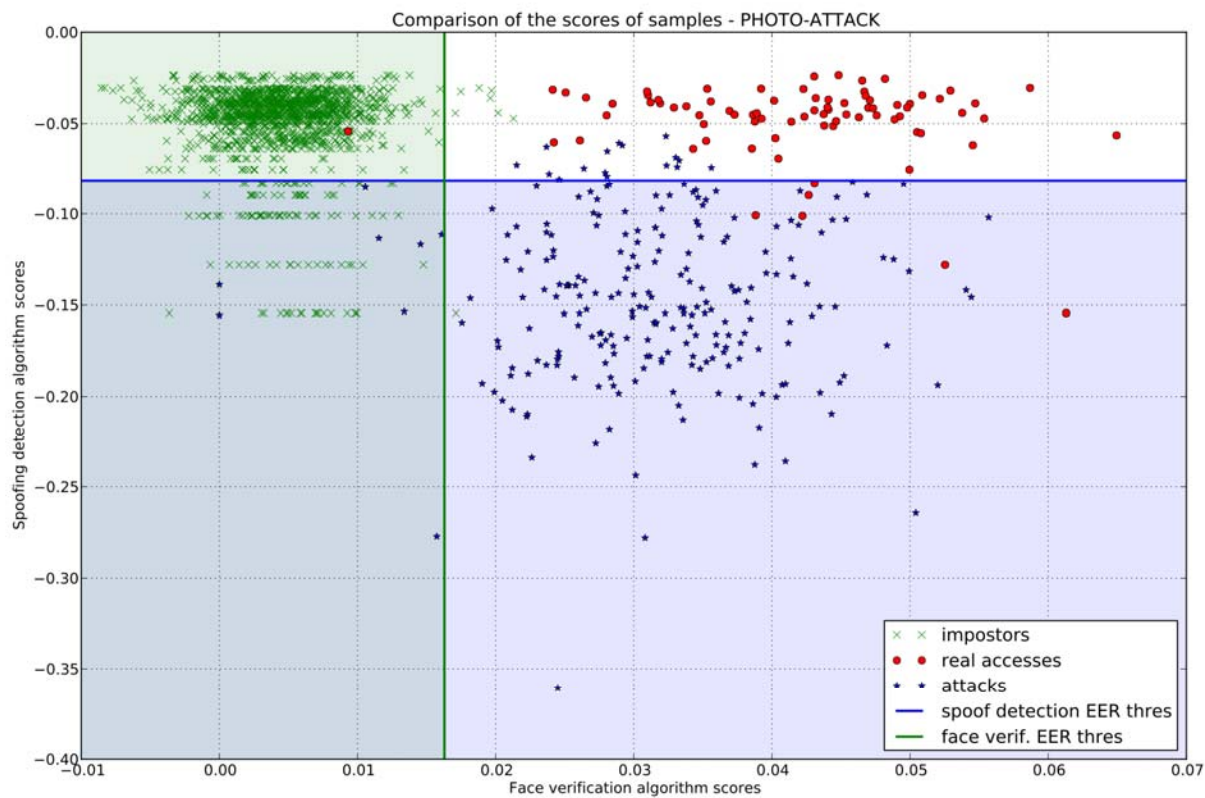


Vulnerability to spoofing





Countermeasures to spoofing



not detected impostors: 0.46 %
not detected attacks: 6.67 %



A Demonstration Prototype in FR





More information at
<http://www.tabularasa-euproject.org/>

Thank you for your attention

**For any question or future
collaborations please contact**

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