




BEAT - Project Overview

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 On behalf of Dr Sébastien Marcel
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Biometrics Evaluation and Testing (BEAT)


Research Projects Conference - Darmstadt, Sep 2015



BEAT « Biometrics Evaluation and Testing »

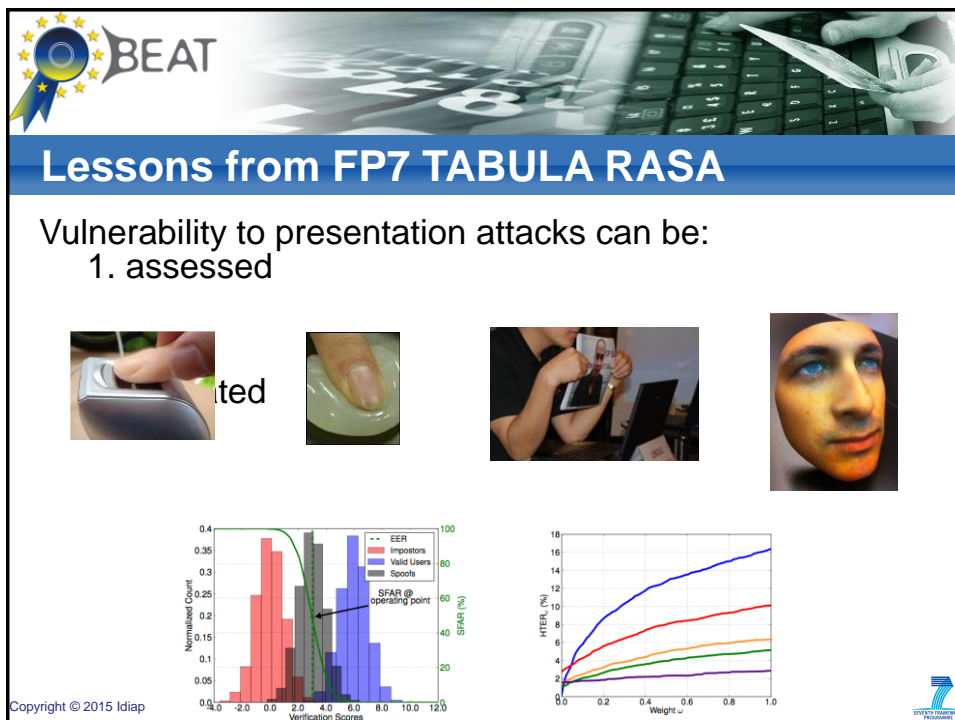
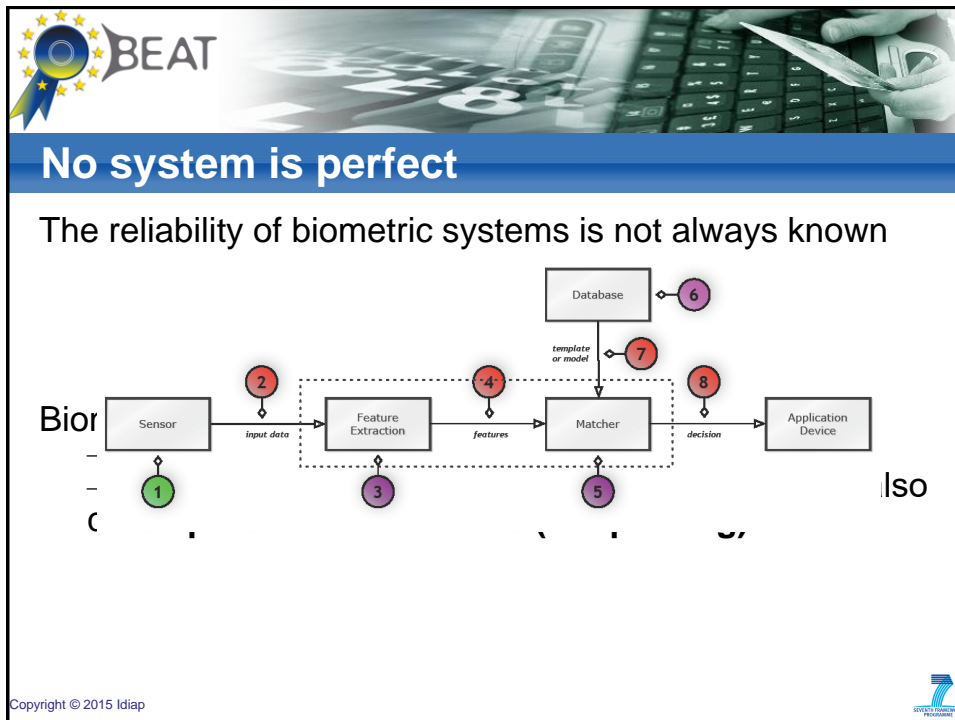
FP7 SEC (2012 – 2016)
 Performance evaluation, vulnerabilities and privacy protection
 Certification


<http://www.beat-eu.org>



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BEAT : objectives

- To propose a framework of standard operational evaluations for biometric technologies
- Evaluation of the **performance** of biometric systems
- Evaluation of the **vulnerabilities** of biometric systems
- Evaluation of **privacy preservation** mechanisms
- Developing **standardization** documents (**certification**)
- Integration and deployment of the **BEAT platform**
- Dissemination and exploitation on research activities
- Legal aspects

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BEAT : Partners

1	Idiap Research Institute	IDIAP
2	Universidad Autonoma de Madrid	UAM
3	University of Surrey	UNIS
4	Ecole Polytechnique Fédérale de Lausanne	EPFL
5	Informatics and Information Security, Advanced Technologies Research Center	TUBITAK
6	Commissariat à l'énergie atomique et aux énergies alternatives	CEA
7	Morpho	MORPHO
8	TÜV Informationstechnik GmbH	TUVIT
9	Katholieke Universiteit Leuven	KULEUVEN
10	Chalmers University of Technology	CHALMERS

•Advisory Board: BSI (DE), NPL (UK), ANSSI (FR), CCN (SP), BI (AU), EAB (NL)


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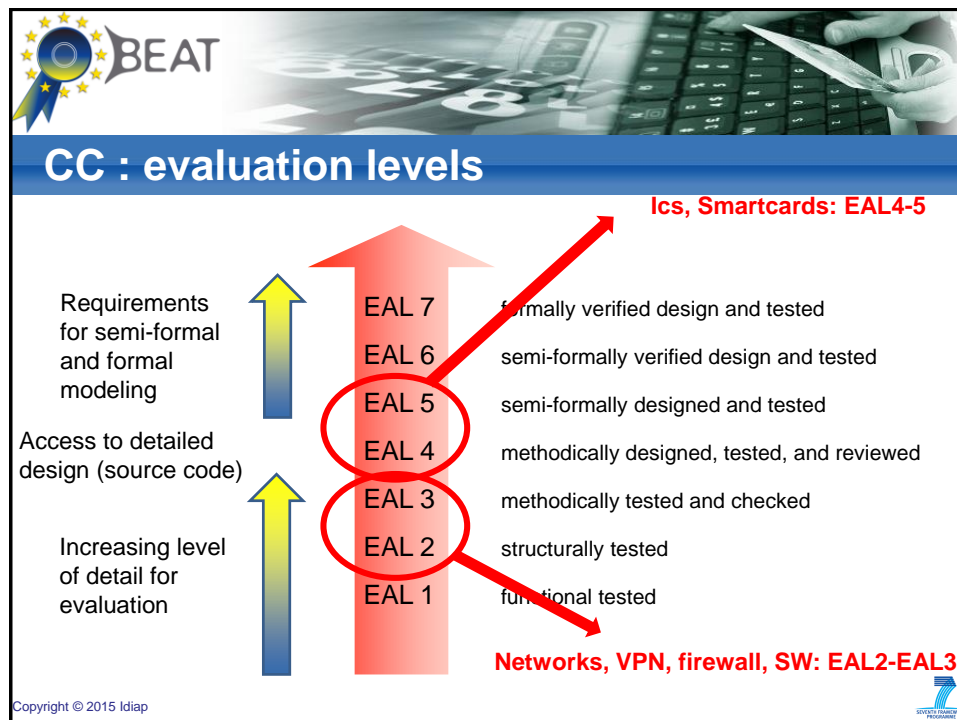
BEAT : objectives

- Towards Common Criteria (CC) evaluations
 - Resistance level rating
 - Vulnerability analysis methodology
 - Reference document
- The Biometrics Evaluation and Testing Platform
 - Web based,
 - Reproducibility and attestations
 - Privacy and data protection taken into consideration
 - Biometric databases NOT accessible



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CC and Biometrics


- **2002: Biometrics Evaluation Methodology (BEM)**
 - Focused on intrinsic performance evaluation (FAR, FRR)
 - Dimensioning databases
- **2007 – Today**
 - Work on fingerprints (France, Germany, Spain)
 - All kind of attacks specific to biometrics (spoofing, “hill climbing”, ...)
 - Document available: [Characterizing Attacks to Fingerprint Verification Mechanisms](http://www.commoncriteriaportal.org/files/ccfiles/2011_CCDB09002_CAFVM-Jul2011.pdf) http://www.commoncriteriaportal.org/files/ccfiles/2011_CCDB09002_CAFVM-Jul2011.pdf
- **PPs from BSI**
 - EAL2, EAL2+
 - Max AVA_VAN.2, or even no AVA_VAN
 - Definition of a dedicated SFR


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Towards CC evaluations

- Adapt the methodology
 - “Translate” CC requirements in “Biometrics” requirements
 - Take into account biometrics specificity – Examples :
 - What is a TOE (parameterized or not) ?
 - How to compute “intrinsic” resistance ?
- Vulnerability analysis methodology
 - How to attack a system ?
 - What are the attacks to take into account ?
- Rating approach and tools for resistance
 - Define a rating table
 - Define the resistance levels

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Example


- Simple system
 - Fingerprint
 - recognition
 - No liveness
 - detection
 - Simple spoof
 - (moulding)
- Simple system
 - Any evaluation
 - will fail

Factor	Identification	Exploitation
Elapsed Time		
<= one day	0	0
<= one week	1	2
<= two weeks	2	4
<= one month	4	8
>= one month	8	16
Expertise		
Layman	0	0
Proficient	2	4
Expert	4	8
Multiple Experts	8	16
Knowledge of TOE		
Public	0	0 (Not applicable)
Restricted	2	0 (Not applicable)
Sensitive	4	0 (Not applicable)
Critical	8	0 (Not applicable)
Access to the TOE/Window of Opportunity		
Easy	0	0
Moderate	2	4
Difficult	4	8
Equipment		
Standard	0	0
Specialized	2	4
Bespoke	4	8
Access to Biometric Characteristics		
Easy	0 (Not applicable)	0
Moderate	0 (Not applicable)	2
Difficult	0 (Not applicable)	4
Success Rate		
70% - 100 %	0 (Not applicable)	0
30 % - 70 %	0 (Not applicable)	2
< 30%	0 (Not applicable)	4
Total	0	0 or 2

2D face
Fingerprint

0-2



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BEAT : objectives

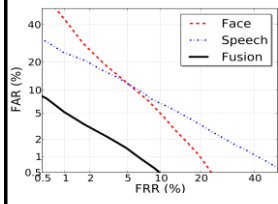
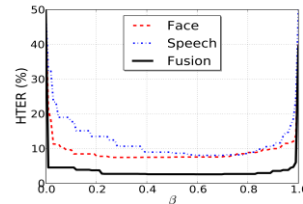
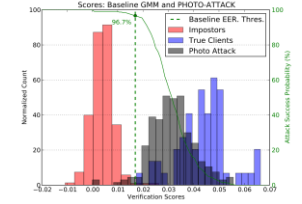
- Towards Common Criteria (CC) evaluations
 - Reference document available in Feb 2016 (public)
 - ICCC 2015 Sep 22-24
 - Event in Jan/Feb 2016
- The Biometrics Evaluation and Testing Platform
 - Web based,
 - Reproducibility and attestations
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 - Biometric databases NOT accessible

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The BEAT online evaluation platform

- Goals
 - Benchmarking biometric algorithms (or components)
 - Reproducibility of research results
 - Educational resource
 - Security certification/attestation


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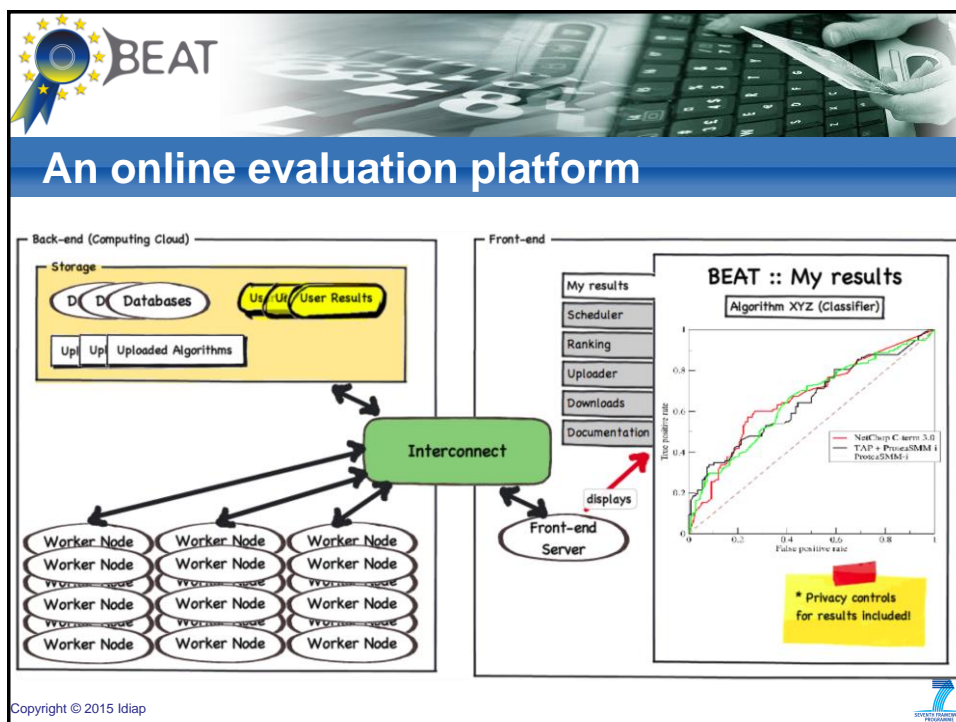





The BEAT online evaluation platform

- Requirements
 - Web accessible
 - Certification/Attestation of biometric algorithms
 - Allow reproducibility of public results
 - Common protocols and standard metrics
 - Source code (or binaries) uploaded
 - Respect privacy consideration (source code, IP)
 - Privacy and data protection taken into consideration
 - Biometric databases not accessible for download

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






BEAT: User Page

BEAT

Search this website...



Experiments

Toolchains

Algorithms

Libraries

Data formats

Attestations

Searches

Reports

Databases

Environments

Teams

Activity

Find an experiment...


Sharing: All Public Private Mine

Status: All Done Running Scheduled Pending Failed

New

Add to report







	Status	Date	Database	Name	CPU time	I/O
<input type="checkbox"/>	Done	Sep 1, 2015	mobio.female	tpereira/tutorial/full_ibphs/2/btas2015_LBP-baseline_periocular_mobio-female_det	6.03s	1.27MB / 3.28kB
<input type="checkbox"/>	Done	Sep 1, 2015	mobio.female	tpereira/tpereira/full_isv_multi/2/btas2015_face-periocular_mobio-female_det	6.03s	1.27MB / 3.28kB
<input type="checkbox"/>	Done	Sep 1, 2015	mobio.female	tpereira/tpereira/full_isv/2/btas2015_periocular_mobio-female_det	5.62s	1.27MB / 3.28kB
<input type="checkbox"/>	Done	Sep 1, 2015	mobio.female	tpereira/tpereira/full_isv/2/btas2015_face_mobio-female_det	6.55s	1.27MB / 3.28kB
<input type="checkbox"/>	Failed	Aug 21, 2015	atnt.idiap_test_eyepos	chichan/chichan/full_mlbphs/1/MLBPH_comp7	1.12s	0.00kB / 0.00kB
<input type="checkbox"/>	Done	Jul 30, 2015	atvskeystroke.A	smarcel/aythamimm/btas15_keystroke_experiments/6/Keystroke_Experiment-rr3	0.00ms	0.00kB / 0.00kB
<input type="checkbox"/>	Done	Jul 29, 2015	atvskeystroke.A	smarcel/aythamimm/btas15_keystroke_experiments/6/Keystroke_Experiment-rr2	0.00ms	0.00kB / 0.00kB
<input type="checkbox"/>	Done	Jul 29, 2015	atvskeystroke.A	smarcel/aythamimm/btas15_keystroke_experiments/6/Keystroke_Experiment-rr1	0.00ms	0.00kB / 0.00kB
<input type="checkbox"/>	Done	Jul 29, 2015	atvskeystroke.A	aythamimm/aythamimm/btas15_keystroke_experiments/6/BTAS_2015_Kesytroke_Experiment	0.00ms	0.00kB / 0.00kB
<input type="checkbox"/>	Failed	Jul 28, 2015	atvskeystroke.A	aythamimm/aythamimm/btas15_probe/1/atvs_kesytroke_test147	1.40s	0.00kB / 0.00kB
<input type="checkbox"/>	Failed	Jul 28, 2015	atvskeystroke.A	aythamimm/aythamimm/btas15_probe/1/atvs_kesytroke_test124	0.00ms	0.00kB / 0.00kB
<input type="checkbox"/>	Done	Jul 24, 2015	atnt.idiap	smarcel/tutorial/eigenface_with_preprocessing/1/eigenface-prepro-tutorial-pca15-ter	7.79s	8.65MB / 1.40MB
<input type="checkbox"/>	Done	Jul 24, 2015	atnt.idiap	smarcel/tutorial/eigenface_with_preprocessing/1/eigenface-prepro-tutorial-pca10-ter	0.00ms	0.00kB / 0.00kB



BEAT: Omni Search

BEAT

Search this website...



smarcel / db-mobio-type-results

Save as Save

MOBIO results (ISO) [edit]

Filters

database-name

contains

mobio

+

-

experiment-author

contains

smarcel

+

-

protocol-name

contains

male

+

-

analyzer

is

eerhter_postperf_iso

+

-

Apply

Results (3)

Protocol: mobio.male

Analyzer: tutorial/eehter_postperf_iso/1

Add to report

	Experiment	far_test	eer	hter	frr_test
<input type="checkbox"/>	smarcel / tutorial/full_isv2 / mobio_male-gmm_100Gx10l-isv_50Ux10lx4R-dct_12Bx8Ox45C-seed101	0.178	0.157	0.203	0.228
<input checked="" type="checkbox"/>	smarcel / tutorial/full_ubmgmm/2 / mobio_male-ubm_gmm_100Gx10l-dct_12Bx8Ox45C	0.448	0.371	0.388	0.329
<input type="checkbox"/>	smarcel / tutorial/full_ubmgmm/2 / mobio_male-ubm_gmm_512Gx100l-dct_12Bx8Ox45C	0.418	0.352	0.38	0.342


Cop

100

ISO/IEC 19795-1:2006(E) ROC







BEAT: Attestation (click here)

Search this website...

Attestation #1721510690

The BEAT platform attests that the following results were obtained by an experiment performed on our servers, and that we kept all the details needed to reproduce them (toolchain, algorithms and parameters).

Creation date: May 17, 2015, 12:16 p.m.
Publication date: May 17, 2015, 12:16 p.m.


Experiment

smarcel/tutorial/full_jsv2/mobio_male-gmm_100Gx10I-isv_50Ux10Ix4R-dct_12Bx8Ox45C-seed101

Results

analysis	
eer	0.157
far_dev	0.157
far_test	0.178
frr_dev	0.157
frr_test	0.228
htr	0.203
number_of_negatives_dev	57960
number_of_negatives_test	147630



Copy



BEAT platform

- Status
 - Operational and hosted at Idiap (100+ users) :
 - <https://www.beat-eu.org/platform/>
 - Hosting biometric databases (14 so far) for face, speaker, fingervein, keystroke, anti-spoofing, ...
 - Documented API
 - <https://www.beat-eu.org/platform/docs>
 - Tutorial @ BTAS 2015
 - <http://www.btas2015.org/Tutorials.html>
 - Organisations interested : NFI, JRC, NIST, IARPA
-




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BEAT platform

- Next
 - Hosting more biometric databases : palmvein, iris, fingerprint
 - Organize an international competition with the platform
 - License the platform to 3rd parties
- The BEAT platform is for you if you need to :
 - Perform evaluation WITHOUT distributing the data
 - Share your data WITHOUT distributing it at large

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 - Operational at Idiap :
 - <https://www.beat-eu.org/platform/>
 - Final release of platform : Feb 2016

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