NIST
National Institute of Standards and Technology
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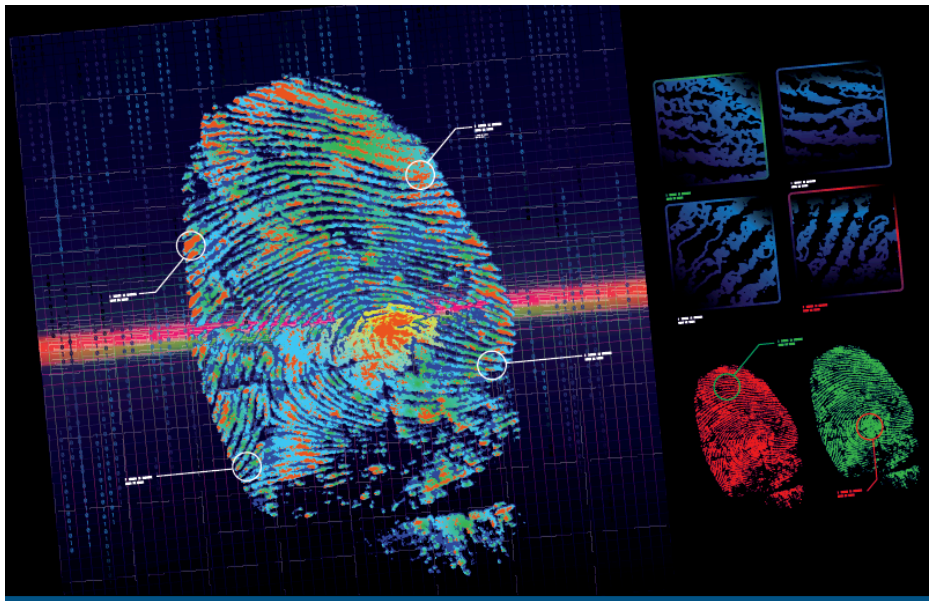
Federal Office for Information Security



Biometric Quality

The last 1% Biometric Quality Assessment for Error Suppression

Next Generation NFIQ

Elham Tabassi

NIST / ITL / Image Group

National Institute of Standards and Technology
U.S. Department of Commerce

Federal Office for Information Security

Team Members

- NIST (U.S.)
- BSI (Germany)
- BKA (Germany)
- Fraunhofer IGD
- Hochschule Darmstadt / CASED
- secunet Security Networks AG
- *...and you?*

Sponsors

Homeland Security
Science and Technology

Bundeskriminalamt

Fraunhofer IGD

CASED

secunet

Match 2012 workshop agenda

13:00 Elham Tabassi, NIST, NFIQ 2.0 project overview

13:20 Oliver Bausinger, Motivation and use cases for NFIQ 2.0

~~13:35 Michael Schwaiger, Framework, architecture, modularization~~

13:55 Christoph Busch, Technical overview of features

14:05 Martin Olsen, Candidate features, computation and visualization

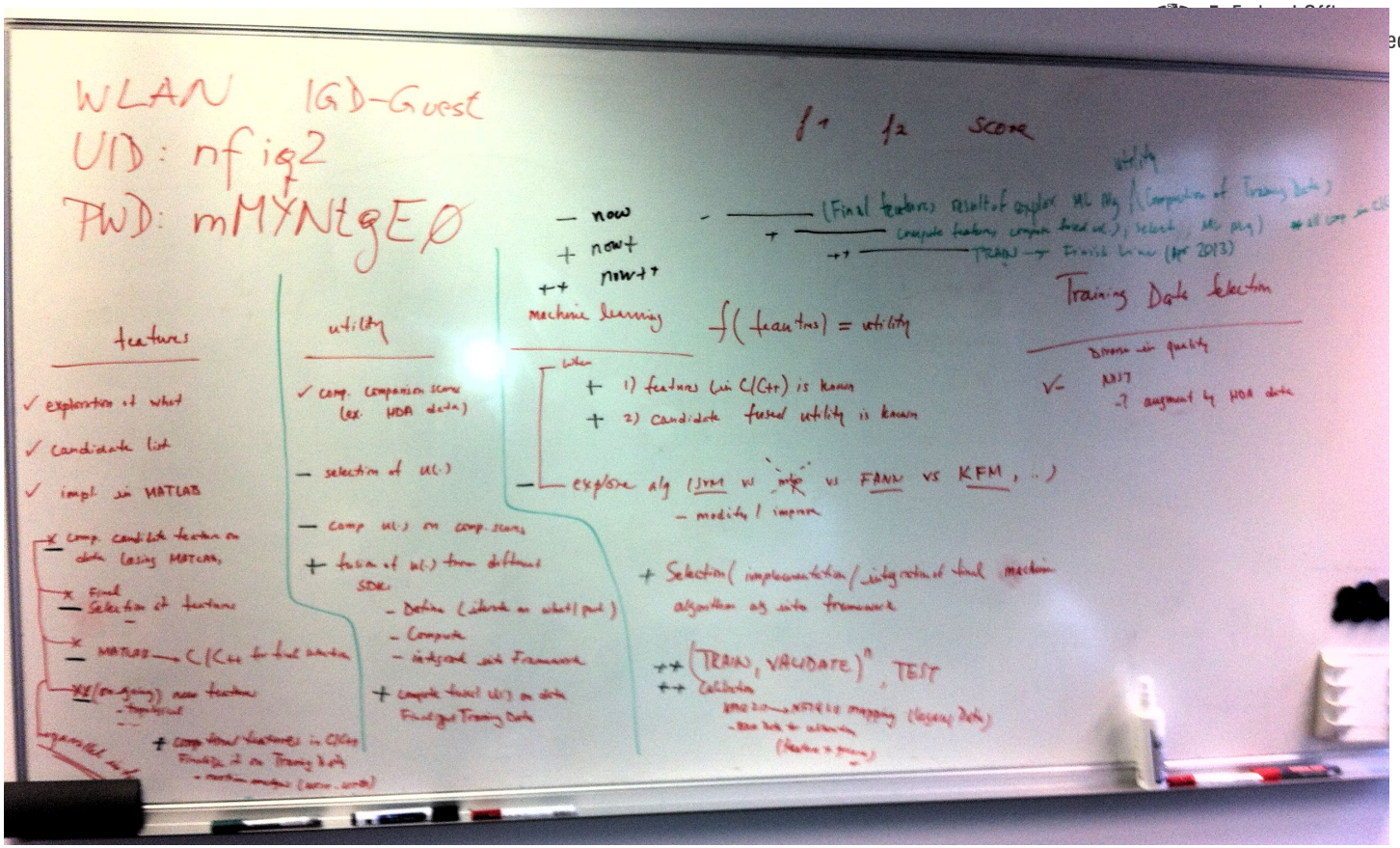
15:15 Break

15:45 Johannes Markle, Quality feature evaluation, preliminary results

16:15 Timo Ruhland, AFIS quality requirements and implementation

16:30 Soweon Yoon, Inclusion of mutilated fingerprint detection

16:50 Elham Tabassi, discussion on what's next.



OUR TO-DO list for 2012

Discussion topics at the workshop

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- NFIQ 2.0 for images captured by non-optical sensors
  - Such as swipe sensors used by mobile phones
  - Answer: happy to consider dedicated NFIQ 2.0 for swipe sensors when sufficient data becomes available.
- NFIQ 2.0 for AFIS systems
    - Can NFIQ 2.0 predict performance of finger image / latent comparison when it is developed for finger / finger comparison?
    - Answer: Calibration – expected error rate of quality levels will be different but order will stay the same.
- Revision of ISO/IEC 29794-1 to include confidence intervals?
- Computational expense
  - Will be considered, but have not evaluated yet
  - But when features are optimized for speed, they will most probably change.
  - Strive for ~125-150 msec
- Are matlab codes implementation available? Yes.
- Inclusion of fingerprint-ness in NFIQ 2.0 – it is liveness issue and not quality? Is it already included in NFIQ 2.0?

We are asking your review/ comment/contribution

1. Features (mathematical equation, or implementation)
2. Utility function (mathematical equation, or implementation)
3. Composition of training data (donations of challenging images)
4. Machine learning algorithm
5. Anything else that we are missing.

Documents for public review

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Topic	Document	Comment by
Quality features definitions	biometrics.nist.gov/cs_links/quality/NFIQ_2/IBPC2012/NFIQ2_Quality_Feature_Definitions.pdf	
Quality feature evaluation	biometrics.nist.gov/cs_links/quality/NFIQ_2/IBPC2012/NFIQ2_Feature_Evaluation_v0.5.pdf	
NFIQ 2.0 Framework		
Training data composition		
Utility		

Communication

- Website:: www.nist.gov/itl/iad/ig/development_nfiq_2.cfm
- Email :: nfiq2 DOT development AT nist DOT gov
- Email reflector? On-line Discussion forum? (requires moderator – do we have resources?)
- Next workshop?
  - Before or after BioSIG Sept 6-7, 2012
  - Or?

Long term plans

Standardized Feature?

Vector of quality components

- Revision of ISO/IEC 29794-4
- Follow the Part 6 (iris quality) model
  - For each quality component: Specify definition (what it is), computation method, measurement unit, threshold/valid range

Allows for

- Plug-and-play of features

  for implementations that satisfy semantic conformance to the requirements of the standard
- Actionable quality
  - constructive feedback
  - mitigation

Elham Tabassi
tabassi@nist.gov

www.nist.gov/itl/iad/ig/development_nfiq_2.cfm
nfiq2 DOT development AT nist DOT gov