From: C. L. Wilson [cwilson@nist.gov]
Sent: Tuesday, December 02, 2003 8:29 AM
To: Travis L. Farris; (b)(6) Janet M. Boodro; Roy Weise; (b)(6) Tom Hopper; (b)(6) (b)(6) John Atkins
Subject: new finger results

Attachments: Results_12-02-03.ppt

Results_12-02-03.p
pt

Since the 303a report was issued the results for fingerprints have improved
substantially. This ppt reflects that improvement.

Current NIST Face and Fingerprint Results

- Recent results of test conducted for the US VISIT program show that fingerprints are substantially more accurate than face for both image well controlled and poorly controlled image quality.

- Using realistic DHS (INS) data commercial fingerprint systems using one index fingerprint can provide 97% probability of verification with a 1% probability of false acceptance. For poor quality images this result falls to 95% at 1% false accept.

- Tests show that for the best commercial systems using well controlled State Department data, face recognition can provide 90% probability of verification with a 1% probability of false acceptance for verification. Outdoor illumination results in 47% probability of verification.

- Large scale identification may require four or more fingerprints. Ten flat fingerprints were recommended.

(b)(6)

From: (b)(6)

Sent: Friday, October 10, 2003 4:43 AM

To: 'Michael D. Garris'; kkipferl@cogentsystems.com

Cc: 'Kelly Kipferl'; 'C. L. Wilson'; (b)(6) rbillups@cogentsystems.com; jjasinski@cogentsystems.com; Jennings, Von; Andrew Walsh (N-Keyware Solutions) (E-mail)

Subject: RE: [Fwd: DHS 1:1 Verify architecture]

Kelly,

(b)(4)

(b)(6)

-----Original Message-----
From: Michael D. Garris [mailto:mgarris@nist.gov]
Sent: Thursday, October 09, 2003 1:45 PM
To: kkipferl@cogentsystems.com
Cc: 'Kelly Kipferl'; 'C. L. Wilson'; (b)(6) rbillups@cogentsystems.com; jjasinski@cogentsystems.com
Subject: Re: [Fwd: DHS 1:1 Verify architecture]

Very helpful information ...

Kelly Kipferl wrote:

Mike,

(b)(2)High, (b)(3), (b)(4)

4/12/2006

Kelly

-----Original Message-----
From: Michael D. Garris [mailto:mgarris@nist.gov]
Sent: Wednesday, October 08, 2003 9:04 AM
To: Michael D. Garris
Cc: Kelly Kipferl; C. L. Wilson; (b)(6)
Subject: Re: [Fwd: DHS 1:1 Verify architecture]

Hi Kelly,

Upon further discussion with Charlie, we would need to DHS 1:1 application
to take feature files as input, not images. Otherwise we unnecessarily re-extract
gallery cases over and over again.

Mike

Michael D. Garris wrote:

Hi Kelly,

(b)(2)High, (b)(3), (b)(4)

Thanks,
Mike

C. L. Wilson wrote:

Subject: Re: DHS 1:1 Verify architecture
From: "C. L. Wilson" <cwilson@nist.gov>
Date: Wed, 08 Oct 2003 07:51:31 -0400
To: kkipferl@cogentsystems.com

4/12/2006

(b)(2)High, (b)(3), (b)(4)

--
Michael D. Garris
mgarris@nist.gov
VOICE: 301-975-2928
FAX: 301-975-5287

National Institute of Standards and Technology
225/A216
100 Bureau Dr, STOP 8940
Gaithersburg, MD 20899-8940

From: (b)(6)
Sent: Thursday, September 04, 2003 8:21 AM
To: 'C. L. Wilson'
Subject: RE: Assistance for Self service checkout for Exit

What are you feelings of quality for the slap four versus single prints.

(b)(6)

-----Original Message-----
From: C. L. Wilson [mailto:cwilson@nist.gov]
Sent: Thursday, September 04, 2003 8:03 AM
To: (b)(6)
Subject: Re: Assistance for Self service checkout for Exit

(b)(6)

Ming has a segmentor for flats that runs in a pc so it should be ok to do this.
My suggestion would be to send the fingerprints from IDENT and do the match in the PC.
Most of the verification SDK are better than IDENT a the one-to-one task including
Cogent's. It sounds like you need a new client either way.
Charlie

(b)(6)   wrote:

> Charlie,
>
> I am looking for some technical guidance from NIST (Charlie) on the
> following:
>
> US-VIST is going to go with a concept of a self service checkout
> workstation for the travelers out of the country. The traveler will
> biometrically and biographically check them self out of the country.
> They way that we see this happening is that the individual will
> perform a document swipe of the passport or Visa and then present
> their biometrics (fingerprints) for submission to the IDENT database.
> There will be no watch list data checked on a real time basis (at this
> time) but we will be able to matchup the arrival record with a
> departure record biographically and also biometrically. This of
> course will be also verified with the airline departure manifests. The would like to
have your feedback on the following:
>
> We have made many statements about the feasibility of capturing more
> than 2 prints by 12-31. With that being said we are going to have to
> develop a new "Ident" client that will now be used by the general
> public. It is really not IDENT as we have always had an government
> employee walk the person through the proper capturing of fingerprints.
> Now we are requesting the traveler to do this on their own. This add some complexity to
the scenario.
> What would be the technical limitations of having the workstation take
> the slap 4 prints and then segment out the index prints to the IDENT server?
>
> How reliable can we get a segmenter to be on the local workstation?
>
> How fast can the segmentor work locally?
>
> Here is some of the items I see:
>
> Ergonomics - Through the natural use of the slap print you will
> ergonomically force the hand to be in the best position to gather the
> highest quality of fingerprints presentable by the user.
>

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> Best quality- This will greatly reduce the possibility of tips or
> sides of fingers being presented through the ergonomics of the slap print.
>
> Highest level of security- Though the highest quality of the
> fingerprints you will have the highest possibility of making
> identifications and then ensuring the highest level of security. This
> will make the transition to watch list searches.
>
> Limits the need of training- By not having to handle the exemptions
> and the sequence of which the fingerprints are captured this will make
> the user experience easier.
>
> Eases development- By limiting the help screen functions needed to
> train the user this will simplify the development effort required by
> the contractor. However it should be pointed out that a segmentor
> will need to be used locally to extract the fingers out the fingers.
>
> Thanks
> (b)(6)

From: (b)(6)
Sent: Thursday, December 04, 2003 10:57 AM
To: 'mgarris@nist.gov'; 'rama.krishnan@lmco.com'; 'von.jennings@lmco.com'; 'andrew.walsh@lmco.com'
Cc: 'cwilson@nist.gov'
Subject: Re: Atlanta quality distributions

Mike

After we met in Atlanta I requested a breakout of thw quality scores we have seen during the pilot and here is what I received.

I would ask that you work with Krish from LMCO if you any additional breakouts.

Thanks
(b)(6)

Krish, Von, and (b)(6)

(b)(2)High, (b)(3), (b)(4)

Sent from BlackBerry Wireless Handheld

-----Original Message-----
From: Michael D. Garris <mgarris@NIST.GOV>
To: (b)(6)   @dhs.gov>
CC: C. L. Wilson <cwilson@NIST.GOV>
Sent: Thu Dec 04 09:48:33 2003
Subject: Atlanta quality distributions

Hi (b)(6) ,

I am preparing quality distribution results from BCC data in prepartation for Monday's meeting here at NIST. It would be very beneficial to have some distribution statistics from Atlanta (per our discussion Tues evening) to present at Monday's meeting.

Is this a possibility?

Mike

--
Michael D. Garris
mgarris@nist.gov
VOICE: 301-975-2928
FAX: 301-975-5287

National Institute of Standards and Technology
225/A216
100 Bureau Dr, STOP 8940
Gaithersburg, MD 20899-8940

From: (b)(6)
Sent: Wednesday, November 19, 2003 8:04 AM
To: 'cwilson@nist.gov'; (b)(6) @dhs.gov'
Subject: Re: Atlanta update

Sounds good to me. We can talk when I get back.

Sent from BlackBerry Wireless Handheld

-----Original Message-----
From: C. L. Wilson <cwilson@nist.gov>
To: (b)(6) @dhs.gov>
Sent: Wed Nov 19 07:53:26 2003
Subject: Re: Atlanta update

(b)(6)

Unless you want to discuss Atlanta I think that we should not meet on Nov. 24. We will be
in the middle of getting the new machine going. I can send an e-mail to the group if you
like. Having the next meeting on Dec. 1 seems good.
Charlie

"(b)(6) " wrote:

> Mike and Charlie
>
> (b)(2)High, (b)(3), (b)(4)
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> Thought you might like to hear this!
>
> (b)(6)
>
> ---------------------------
> Sent from BlackBerry Wireless Handheld
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From: C. L. Wilson [cwilson@nist.gov]
Sent: Wednesday, July 30, 2003 3:32 PM
To: (b)(6)
Cc: (b)(6) Jim Williams (E-mail)
Subject: Re: Suggested Revisions to RFP for BVS

I agree with this assessment.

(b)(6) wrote:

> (b)(4)
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(b)(2)High

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From: C. L. Wilson [cwilson@nist.gov]
Sent: Wednesday, December 10, 2003 7:55 AM
To: (b)(6)
Cc: Michael D. Garris; Mike McCabe
Subject: revised summary

Attachments: Status of NIST IDENT System Testing for US.doc

Status of NIST
IDENT System Te...
(b)(6)

After a day looking at this we revised it a little. Since this is very close to the exec
summary of the report, if I send it to you in a letter or official memo the the report is
essentially public. Is this ok?
Charlie

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Status of NIST IDENT System Testing for US-VISIT

As of December 8, 2003:

The existing IDENT many-to-one matching system has been tested and NIST concludes that:

1. Using Department of State (DOS) Mexican visa (BCC) data, the true accept rate (TAR) using index finger pairs is independent of background database size over the range from 100,000 entries to 6,000,000 entries and is 93% using existing threshold parameters. This result is with shape filtering enabled. Without shape filtering the TAR is 94%.
2. The false accept rate (FAR) using index finger pairs is linearly increasing with database size and is 0.12% using existing threshold parameters for a gallery size of 6,000,000.
3. At the operating level used by the IDENT system, the trade-off between TAR and FAR is such that a large change in FAR results in only a small change in TAR. The trade-off curve is flat, with very small slope change.
4. All the results give here require that the test data be fully consolidated, checked for correct ground truth by fingerprint examiners, since between 1.5% and 0.5% of the original data was found to be incorrectly matched. Approximately 0.1% of the questioned data is of insufficient quality to be resolved by examiners. This 0.1% error rate is the minimum error limit detected in existing government fingerprint databases
5. The Cogent image quality is a good predictor of the IDENT many-to-one matching performance. The best quality images, quality 1, produce a TAR of 98% at a FAR of 0.01%. The worst quality images, quality 8, produce a TAR of 38% at a FAR of 0.01%.
6. Image quality distributions for BCC, the Atlanta pilot study, and OHIO web check were studied to determine how well the operational US-VISIT system could be expected to track BCC and Ohio results. The Atlanta data has slightly more quality 8 images and slightly less quality 1 images but should result in a TAR near BCC. The Ohio data has less quality 8 images and more quality 1 images. This is reflected in a TAR of 98% using the IDENT system.
7. The matcher used in this study achieves a match rate of 537,000 matches/second with shape filtering on and 218,000 matches/second with shape filtering off.

The proposed IDENT one-to-one matching system has been tested and NIST concludes:

1. Using BCC quality data on two index fingers a one-to-one matching with a TAR of 99.5% at a FAR of 0.1% should be achieved.
2. These results were achieved using the a Software Development Kit (SDK) program set supplied by Cogent that is the same algorithm planed for use in VISIT.
3. Testing of seven other SDK's proved that this algorithm is the most accurate although further testing of additional algorithms is planned.
4. All algorithms tested have a significant change in accuracy with image quality. The sensitivity to image quality decreases as the TAR of the specific algorithm increases.

High accuracy algorithms are less sensitive to image quality than low accuracy algorithms.

5. Consolidation results on various datasets available to NIST demonstrate that the error given for one-to-one matching is less than the clerical error rate in most government databases. Clerical errors will be more common than biometric errors for one–to-one matching.

From: cwilson@nist.gov [cwilson@nist.gov at inetgw]
Sent: Tuesday, July 08, 2003 8:05 AM
To: (b)(6) Robert A Mocny; Jim.Williams@dhs.gov; (b)(6) @usdoj.gov
Subject: VTB report

We have completed the verification study part of which was included in the Feb. 4 report
to Congress. Some initial comparisons to commercial verification products are provided in
an appendix. Our VTB matcher is in the middle of the commercial products tested.

This is the link to the pdf of the report:
ftp://sequoyah.nist.gov/pub/nist_internal_reports/ir_7020.pdf

From: cwilson@nist.gov [cwilson@nist.gov at inetgw]
Sent: Thursday, July 03, 2003 2:43 PM
To:
Subject: Multiple body part

Tim McGowan from Sagem is coming by OSTP at 4:00 on Thurs, May 29 to make his critical case on the proposal for a two-finger plus live capture picture proposal as the 'US position on biometrics'

Although there is the usual concern about, um, vendor veracity, you might want to hear his case and ask questions, or send a delegate.

Let me know who wants to come, so I can file their names with security.

--R

From:	C. L. Wilson [cwilson@nist.gov]
Sent:	Tuesday, December 02, 2003 10:00 AM
To:	Travis L. Farris; John Atkins; Janet M. Boodro; Roy Weise; Tom Hopper; (b)(6) (b)(6) Bob Mocny; Omid Omidvar; Kevin Hurst; Mike McCabe; Patrick Grother; Marty Herman
Subject:	and now the attachment
Attachments:	Results_12-02-03.ppt

Results_12-02-03.p
pt

Current NIST Face and Fingerprint Results

- Recent results of test conducted for the US VISIT program show that fingerprints are substantially more accurate than face for both well controlled and poorly controlled image quality.

- Using realistic DHS (INS) data commercial fingerprint systems using one index fingerprint can provide 97% probability of verification with a 1% probability of false acceptance. For poor quality images this result falls to 95% at 1% false accept.

- Using two fingers, VISIT results for verification are expected to be 99.5% probability of verification at 0.1% false accept.

- Tests show that for the best commercial systems using well controlled State Department data, face recognition can provide 90% probability of verification with a 1% probability of false acceptance for verification. Outdoor illumination results in 47% probability of verification.

- Large scale identification may require four or more fingerprints. Ten flat fingerprints were recommended.

From:	cwilson@nist.gov
Sent:	Monday, February 24, 2003 11:57 AM
To:	=CCMAIL (b)(6) at HQ-OPS-001
Subject:	atb test

Attachments: ATB_ID_R.PPT

ATB_ID_R.PPT

Here it is.

ATB Identification Tests

Probe Source	Plain-Rolled		Plain-Plain	
	TX	INS	INS	DOS
Gallery	FBI 1.2M	FBI 1.2M	INS 600K	DOS 600K
Probe	60K	60K	60K	60K
Fingers	10,2,4,6	10,2,4,6	1,2	1,2

ATB Performance (TX/FBI)

default algorithm settings

fingers: # (which)	seconds per probe	μ(TAR)	STDEV (TAR)	μ(FAR)	STDEV (FAR)
10 (1-5,6-10)	2.3	90.4 %	0.34	0.032 %	0.020
6 (2-4,7-9)	4.4	92.1 %	0.23	0.033 %	0.021
4 (2-3,7-8)	7.8	92.0 %	0.19	0.038 %	0.018
2 (2,7)	10.0	97.4 %	0.22	0.467 %	0.108

From:	cwilson@nist.gov
Sent:	Monday, May 05, 2003 1:29 PM
To:	=CCMAIL (b)(6) at HQ-OPS-001
Subject:	ATB

Attachments: ATB_ID_R.PPT

ATB_ID_R.PPT

Note last two slides.

ATB Identification Tests

Probe Source	Plain-Rolled		Plain-Plain	
	TX	BICE	BICE	DOS
Gallery	FBI 1.2M	FBI 1.2M	BICE 600K	DOS 600K
Probe	60K	48K	60K	60K
Fingers	10,2,4,6	10,2,4,6	1,2	1,2

ATB Performance (TX/FBI)

default algorithm settings

fingers: # (which)	filter rate	seconds per probe	μ(TAR)	σ(TAR)	μ(FAR)	σ(FAR)
10:(1-5,6-10)	8.1 %	2.0	90.4 %	0.34	0.032 %	0.020
6: (1-3,6-8)	17.5 %	4.4	92.1 %	0.23	0.033 %	0.021
(2-4,7-9)	12.9 %	3.3	96.3 %	0.24	0.035 %	0.023
4: (1-2,6-7)	30.9 %	7.8	92.0 %	0.19	0.038 %	0.018
(2-3,7-8)	21.8 %	5.3	97.0 %	0.25	0.038 %	0.021
2: (2,7)	38.1 %	10.0	97.4 %	0.22	0.467 %	0.108
(1,6)	-	-	-	-	-	-

The ten print rolled to rolled filter rate is 1.9% for SD 14 data.

ATB Performance (BICE/FBI)

default algorithm settings

fingers: # (which)	filter rate	seconds per probe	μ(TAR)	σ(TAR)	μ(FAR)	σ(FAR)
10:(1-5,6-10)	8.9 %	2.4	82.1 %	0.69	0.100 %	0.047
6: (1-3,6-8)	18.6 %	4.6	84.5 %	0.50	0.106 %	0.040
(2-4,7-9)	15.2 %	3.9	86.9 %	0.51	0.112 %	0.049
4: (1-2,6-7)	32.8 %	8.0	83.7 %	0.52	0.110 %	0.045
(2-3,7-8)	24.7 %	6.4	88.2 %	0.41	0.123 %	0.057
2: (2,7)	42.8 %	10.6	88.1 %	0.45	1.160 %	0.112
(1,6)	-	-	-	-	-	-

The ten print rolled to rolled filter rate is 1.9% for SD 14 data.

ATB Performance (TX/FBI)

default algorithm settings

gallery size [10 fingers]	filter rate	seconds per probe	μ(TAR)	σ(TAR)	μ(FAR)	σ(FAR)
1,229 K	8.1 %	2.03	90.4 %	0.34	0.032 %	0.020
640 K	8.1 %	1.13	90.5 %	0.32	0.017 %	0.019
320 K	8.5 %	0.53	90.6 %	0.34	0.010 %	0.012
160 K	8.3 %	0.27	90.6 %	0.33	0.010 %	0.012
80 K	8.6 %	0.17	90.6 %	0.29	0.010 %	0.012

The ten print rolled to rolled filter rate is 1.9% for SD 14 data.

ATB Performance (BICE/FBI)

default algorithm settings

gallery size [10 fingers]	filter rate	seconds per probe	μ(TAR)	σ(TAR)	μ(FAR)	σ(FAR)
1,223 K	8.9 %	2.43	82.1 %	0.69	0.100 %	0.047
634 K	8.8 %	1.26	82.2 %	0.67	0.088 %	0.054
314 K	9.1 %	0.62	82.4 %	0.64	0.079 %	0.054
154 K	9.2 %	0.32	82.5 %	0.61	0.077 %	0.056
74 K	9.8 %	0.19	82.6 %	0.66	0.075 %	0.056

The ten print rolled to rolled filter rate is 1.9% for SD 14 data.

From: cwilson@nist.gov
Sent: Thursday, April 03, 2003 1:49 PM
To: =CCMAIL (b)(6) at HQ-OPS-001; =CCMAIL:Robert A Mocny at HQ-INP-001; mccabe@nist.gov; mgarris@nist.gov; craig.watson@nist.gov; herman@nist.gov; rweise@leo.gov; garwilli@leo.gov; FARRISLT@state.gov; wneuman@ostp.eop.gov; wstillwe@leo.gov; Janet M. Boodro
Subject: corrected ATB results

Attachments: ATB_ID_R.PPT

ATB_ID_R.PPT

      The finger numbers in the previous ppt's were wrong. They are now correct. The 1,6, 3-2,7-8, and 2-4,7-9 will be added to the slide shortly.

ATB Identification Tests

Probe Source	Plain-Rolled		Plain-Plain		
	TX	INS	INS	DOS	
Gallery	FBI 1.2M	FBI 1.2M	INS 600K	DOS 600K	
Probe	60K	48K	60K	60K	
Fingers	10,2,4,6	10,2,4,6	1,2	1,2	

ATB Performance (TX/FBI)

default algorithm settings

fingers: # (which)	filter rate	seconds per probe	μ(TAR)	σ(TAR)	μ(FAR)	σ(FAR)
10 (1-5,6-10)	8.1 %	2.3	90.4 %	0.34	0.032 %	0.020
6 (1-3,6-8)	17.5 %	4.4	92.1 %	0.23	0.033 %	0.021
4 (1-2,6-7)	30.9 %	7.8	92.0 %	0.19	0.038 %	0.018
2 (2,7)	38.1 %	10.0	97.4 %	0.22	0.467 %	0.108

The ten print rolled to rolled filter rate is 1.9% for SD 14 data.

ATB Performance (INS/FBI)

default algorithm settings

fingers: # (which)	filter rate	seconds per probe	μ(TAR)	σ(TAR)	μ(FAR)	σ(FAR)
10 (1-5,6-10)	8.9 %	2.4	82.1 %	0.69	0.100 %	0.047
6 (1-3,6-8)	18.6 %	4.6	84.5 %	0.50	0.106 %	0.040
4 (1-2,6-7)	32.8 %	8.0	83.7 %	0.52	0.110 %	0.045
2 (2,7)	42.8 %	10.6	88.1 %	0.45	1.160 %	0.112

The ten print rolled to rolled filter rate is 1.9% for SD 14 data.