Building a Better Examiner

Integrating Standards into Facial Examiner Training and Operational Deployments

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Presentation

• Neal Gieselman
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• Masters of Science in Management of Technology
  – University of Minnesota Center for Technological Leadership

• In the biometrics industry since 1992 doing development, deployment, and support of all modalities

• Facial Identification Scientific Working Group (FISWG)
• OSAC Facial Identification Subcommittee
• IAI Facial Identification Committee
• ASTM Member
BLUF

Facial guidelines, best practice, and standards groups

- FISWG: 10 years producing over 25 BPM
- OSAC: Four years with four ASTM approved standards
- IAI: Three years as a standing committee

Questions

- How many attendees participate in these groups?
- How many FR applications / solutions speak to using these BPM / standards in operational deployments?
- How are agency specific operational mandates ensured?
- Who speaks for the facial examiners?
BLUF

• Spoken at the 2015 IAI Conference

“In court battles it’s rarely the conclusion that is the issue but the processes used to arrive at it”

• At the December 2017 CJIS Advisory Policy Board (APB) meeting this motion was approved and has been signed by the FBI Director

“Require CJIS Systems Agency/State Identification Bureau approved training for individuals of agencies/states prior to conducting face recognition searches of the NGI/IPS. Training must be consistent with the "Guidelines and Recommendations for Facial Comparison Training to Competency" as outlined by the FISWG.”

See FISWG document on support of this motion: “Minimum Criteria for Training in Facial Review (Users of Facial Recognition Systems)”
Facial Examiners Need Better Tools

- The examiner’s role should be considered as important as the facial matching algorithm performance

- Tools that protect and help examiners perform at their best can have a dramatic impact on results
  - Train and operate according to standards and best practices
  - Provide useful image analysis features
  - Instant access to operational guidelines
  - Reduce fatigue and eliminate tedious processes
  - Focus on the exam, not multiple applications, image editing, etc.

- The “FaceWorkbench” client came from these goals and ideals
FaceWorkbench

Features and functions align with current/emerging ACE-V fundamentals and FISWG/OSAC Guidelines

• **Analysis**
  – File properties, metadata, compression, hash, facial features
  – Histograms: entire image or facial segmentation

• **Comparison**
  – Agency specific guidelines

• **Evaluation**
  – Case/candidate notes
  – Agency specific source conclusions

• **Verification**
  – Workflow and design allows immediate integration with case management systems
  – Will allow for second and third reviews
1:N Image Comparison

**Detachable screens**

**Independent magnifiers**

**Yes/No examiner candidate selections**

**Mirror probe/candidate image**

**Candidate scoring profile**

**Display eye locations**

**Variable sized candidate images**

**Display image properties / metadata**
1:1 Image Alignment

Set eye locations for 1:1 alignment

Auto or manual eye finding

Lossless file format conversions

Flip or blend viewing options
1:1 Image Comparison

**Detachable screens**

**Image Processing:** contrast, brightness, saturation, rotation, 10 color channels, mirror, edge detection, zoom

**Image histograms:** entire or facial area

**Original image display:** file properties and metadata
1:1 Image Comparison

Embedded agency guidelines
Embedded agency references
Embedded anatomical references

Facial component tracking (Y/N)
Facial component display (optional)
Link facial components to agency references
1:1 Image Comparison

Image magnifiers

Linked, joined or detached

Variable size and magnification

Enable comparison snapshots
1:1 Image Snapshots

Select Facial Component

Three type of annotations: circle, arrow, bracket

15 annotations: can be rotated, scaled, placed, and color coded

Comments use agency defined keyword accelerators:
- Keywords are facial component specific (1..19)
- Examiner enters key word (ala)
- TAB completes keyword entry and adds (expansion) text
- Nose Example: “ala (where nasal base attached to face) “
1:1 Image Comparison

Place 10 reference lines

Lines: vertical or horizontal

Lines: can be added, deleted, moved

Lines and annotations: on/off

Lines: white or black
1:1 Image Comparison

**Embedded reporting**

**Candidate Notes**

**Case Notes**

Agency defined source conclusions:
5 point, 7 point, other

<table>
<thead>
<tr>
<th>Image Conclusion:</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>Description</td>
</tr>
<tr>
<td>Limited support for same source</td>
<td>There are multiple similarities. The prospect of obtaining these results is slightly greater with a same source than with a different source.</td>
</tr>
<tr>
<td>Moderate support for same source</td>
<td>There are multiple similarities with limited fine feature details. The prospect of obtaining these results is greater with a same source than with a different source.</td>
</tr>
<tr>
<td>Strong support for same source</td>
<td>There are a high number of observable similarities and similar fine feature details. The prospect that these similarities would occur with a different source.</td>
</tr>
</tbody>
</table>
1:1 Image Comparison

Examination Report in PDF
Contents can be copy/pasted into agency specific templates
Built automatically

Five detailed sections: header, probe, candidates(s), snapshots, notes, source conclusion(s), annotations
Includes examiner activity log
Examiner Focus

• Reduce fatigue on examiners
  – Workflow “memory”: remember size and placement of dialogs, selections, options, magnification settings, etc
  – Reduce mouse clicks and excessive typing
  – Anatomical definitions don’t need to be manually entered
  – Spell-check on all examiner entered notes

• Examiner Training Options
  – Agency specific 1:1 and 1:N data sets can be created with varying age, gender, race, candidate lists, mates, imposters
  – Data sets have embedded mate/imposter status
  – Conclusions saved so difficult exams or bias can be tracked

• Future items
  – Constant user feedback in support of evolving standards (ACE-V)
  – Examiner profile options with formal workflows
  – 1:1 support for iris, hand, body parts, SMT, vehicle
Summary

• Facial examiner use of best practices and standards is critical to performance, efficiency, quality, and evolution

• Not all facial examiner tools are the same
  – *Tools have a big impact on results*
  – *Decisions will be challenged*

• Facial examiners need “tools” focused on their unique needs and not rely on image editors
  – Not suggesting image editors can’t effectively be used but are not built specifically for the facial examiner practitioner

• The facial examiner should focus on the “examination” and not be concerned with image management, recording the results, spell checking, etc
Final

• Thanks to NIST for their superior support in FR advancements. You are without peer in these areas.

• Shout out to Dr VB for his leadership and commitments to all he has done for FR standards.

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