MBGC

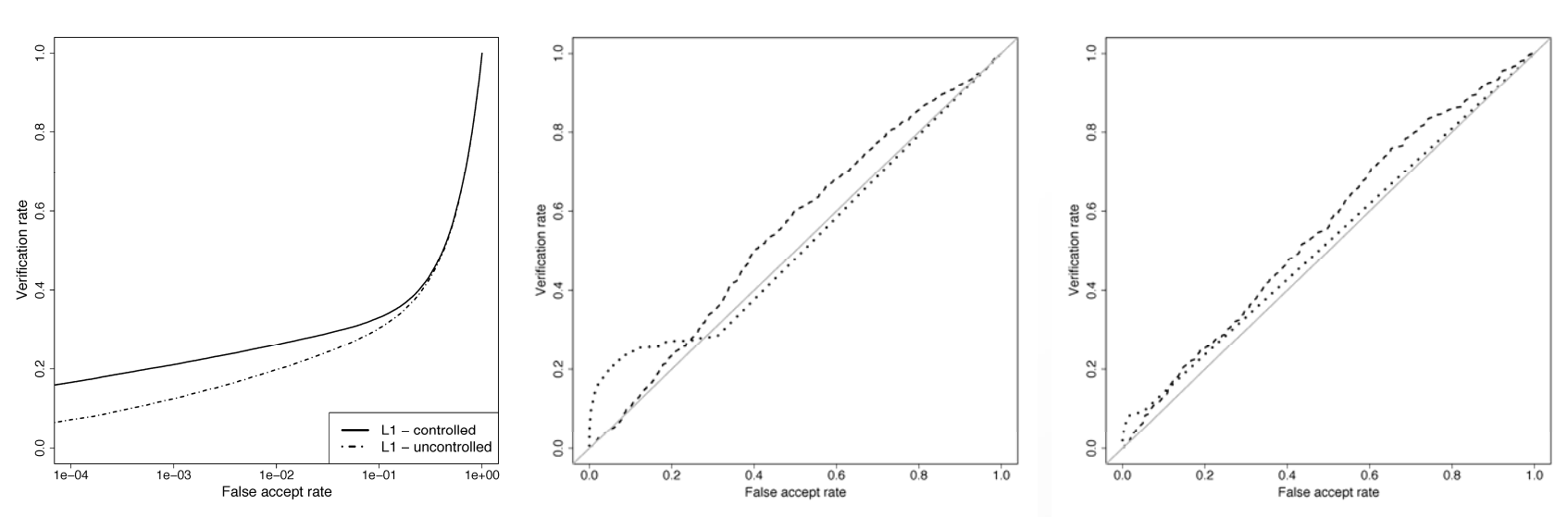
Multiple Biometric Grand Challenge

Future Challenges

04 December 2009

Non-Frontal Face Recognition

Still **Video**

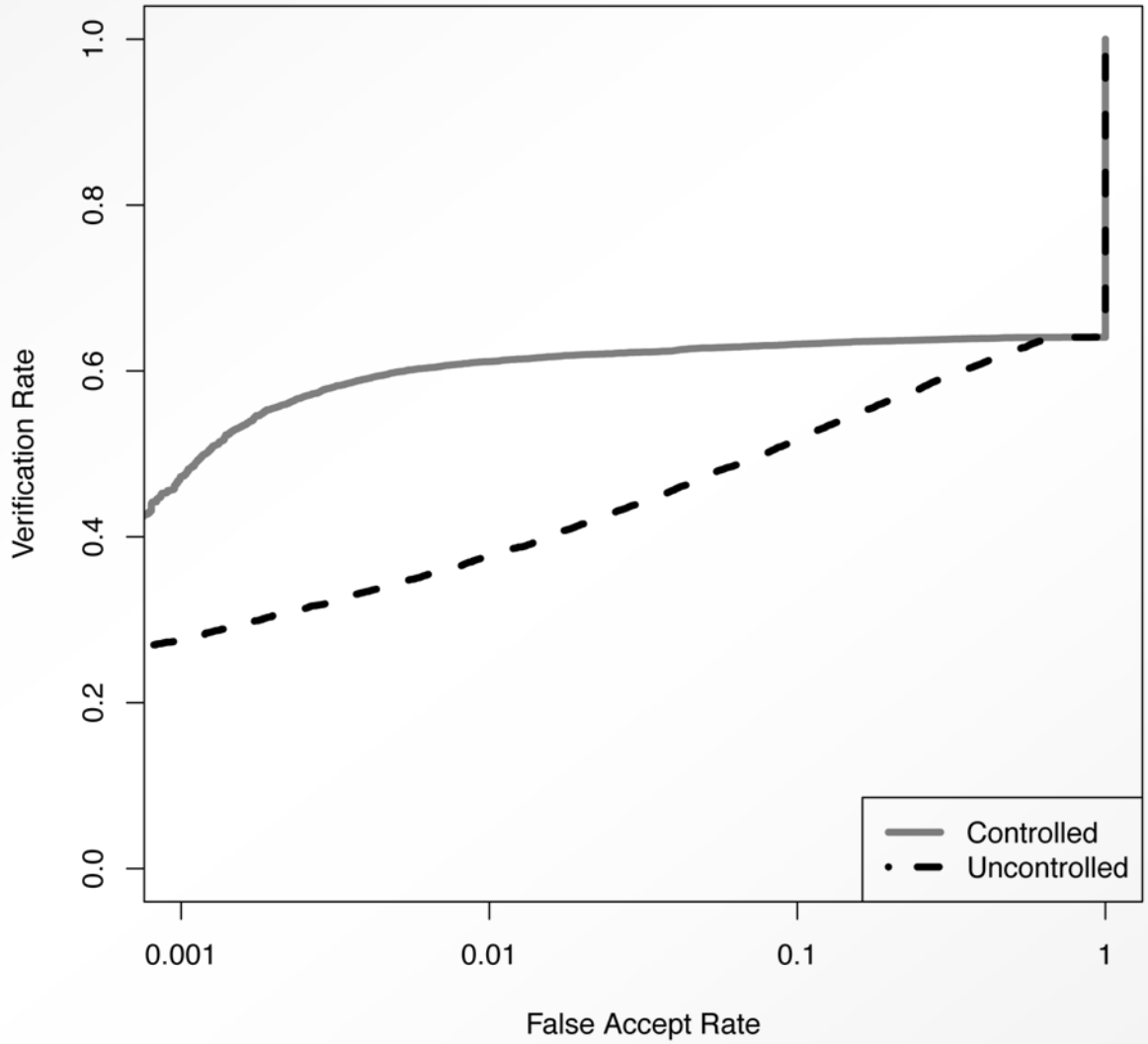


Results from December 2008

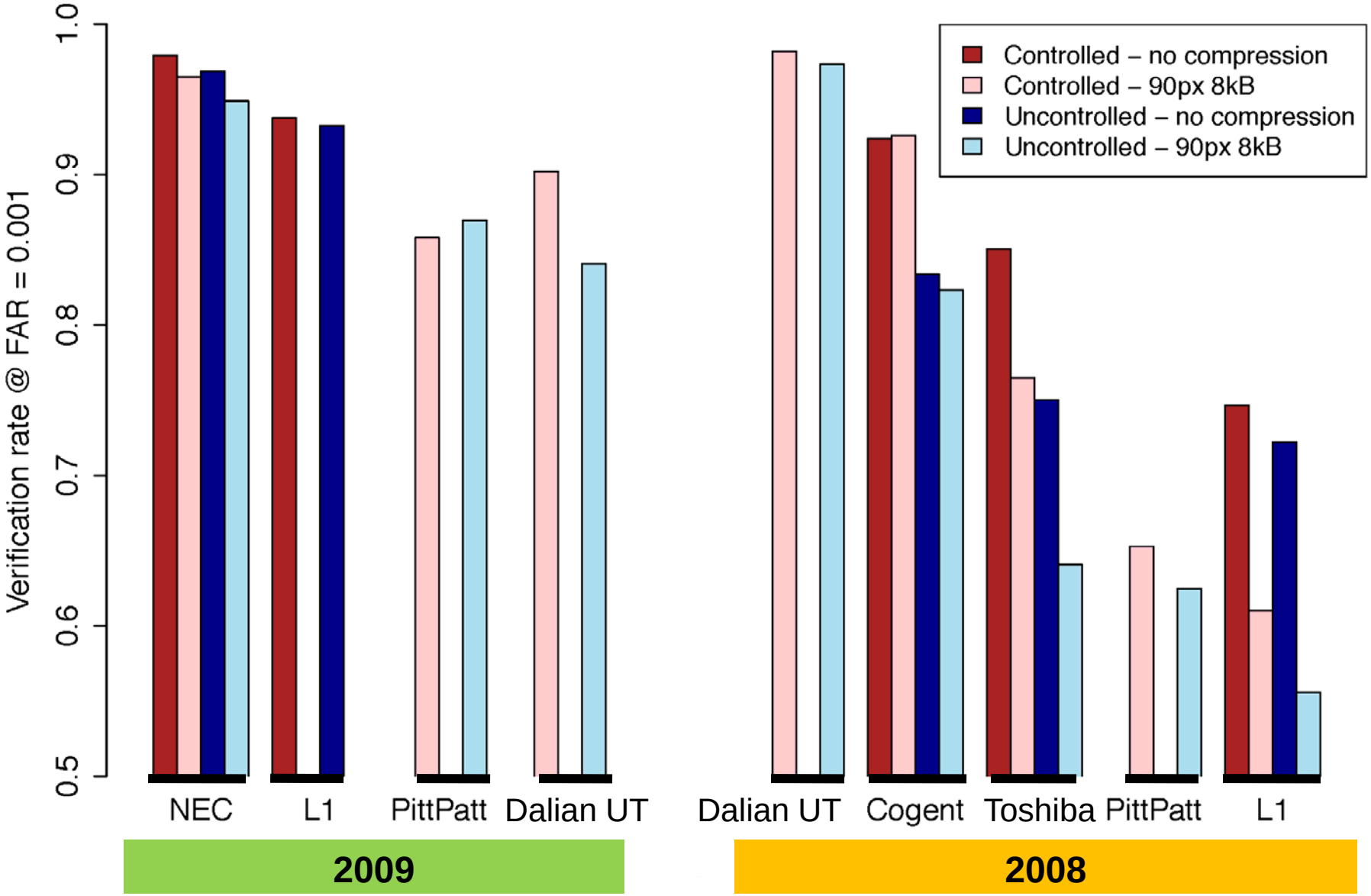
Results from an Open Book Challenge Problem, NOT an Independent Evaluation

Cross mode face recognition

Visible vs near-infrared



Challenges in still frontal face?



Results from an Open Book Challenge Problem, NOT an Independent Evaluation

“The Good, the Bad
&
the Ugly”
Still Face Challenge

Goal of GBU

- Encourage development of face recognition algorithms that work on “hard” to recognize face pairs.
- Not at the expense of performance on “non-hard” face pairs.

Method

- Three performance levels
  - Good
  - Bad
  - Ugly
- Images in MBGC
- Images included in FRVT 2006
- Selected by FRVT 2006 algorithms

Experiment Specifics

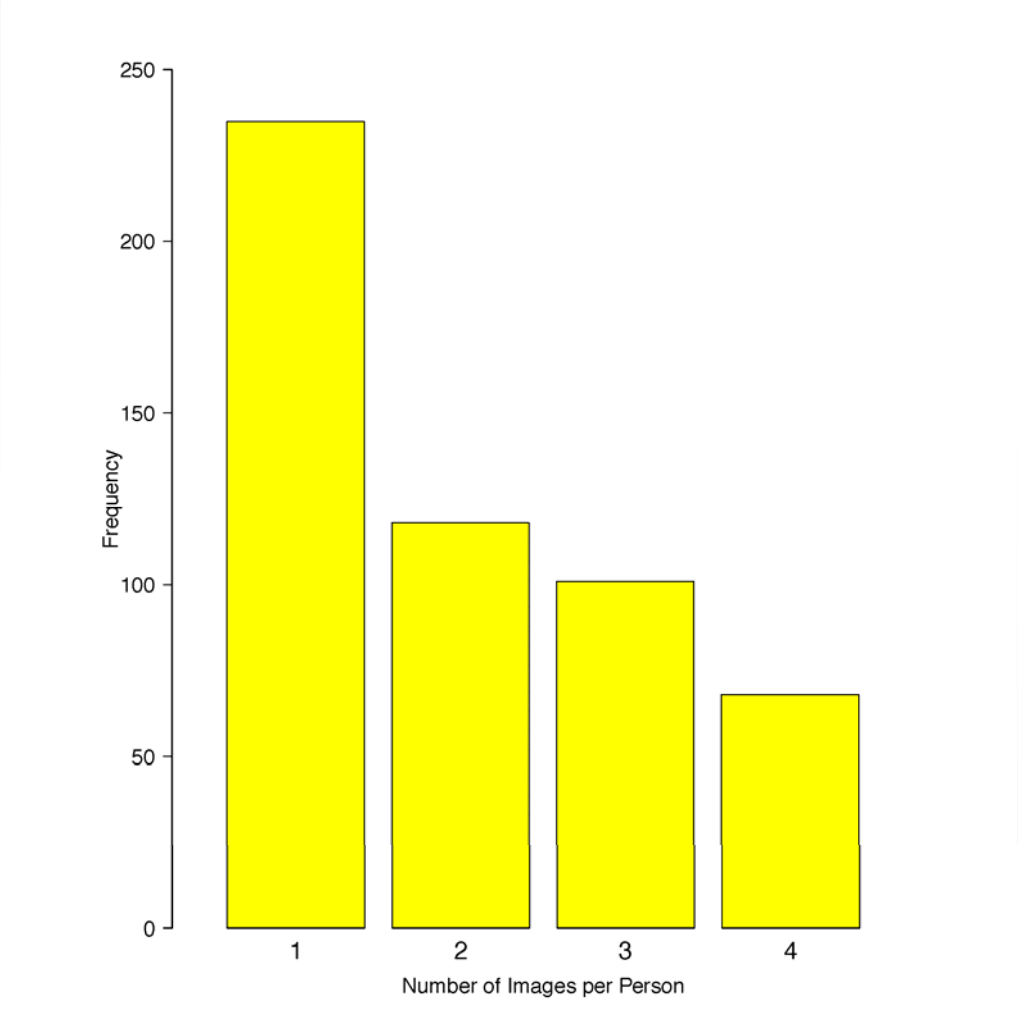
- Nikon D70-6 Mpixels
- Uncontrolled images
  - Indoors
  - Outdoors
- 9,307 pool of images
- 522 qualified subjects

Experiment Specifics

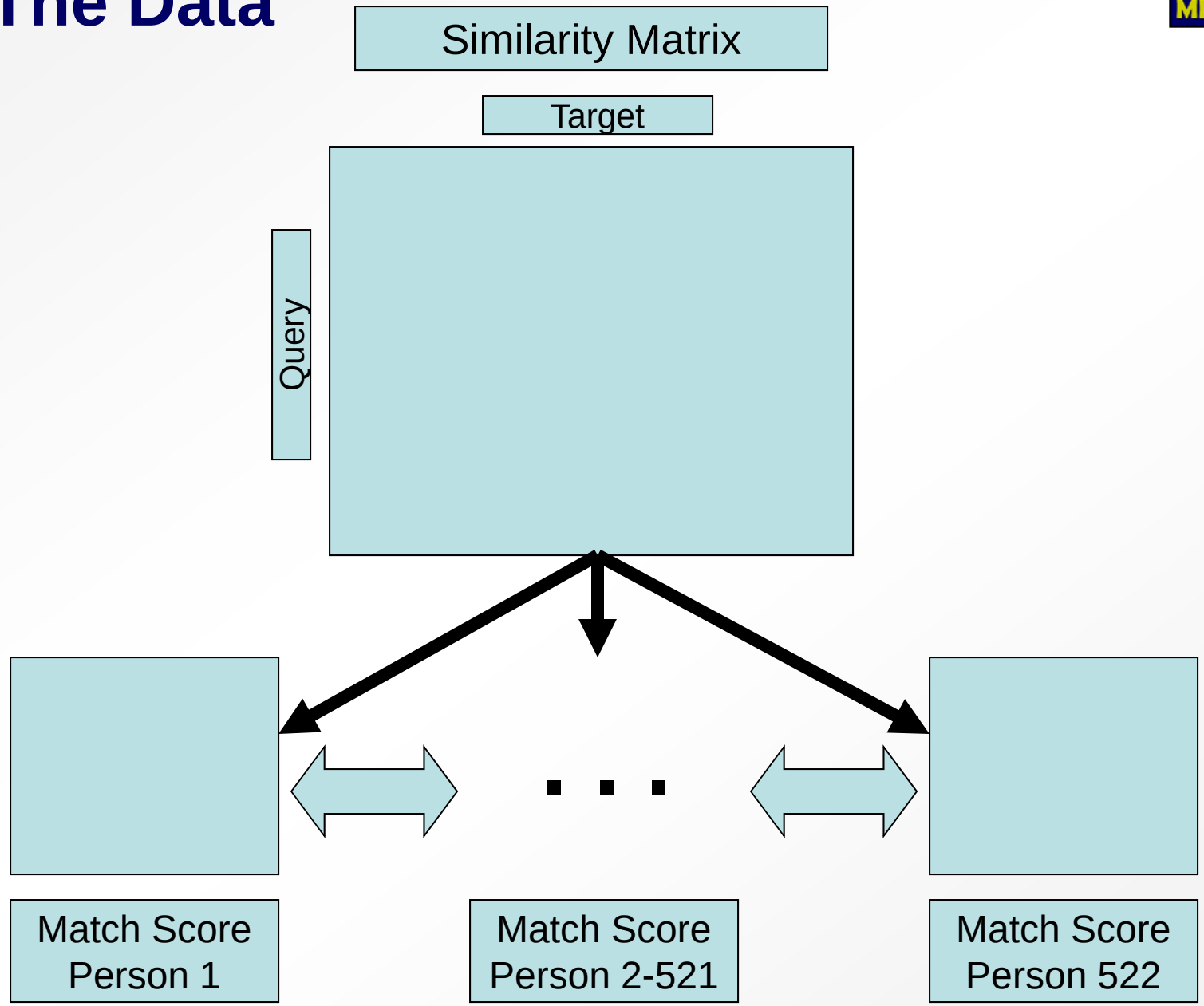
- Same number of images per subject*
- Variation in performance on image attributes

Data Set	*Target Size*	*Query Size*
The Good	1046	1046
The Bad	1046	1046
The Ugly	1044*	1046

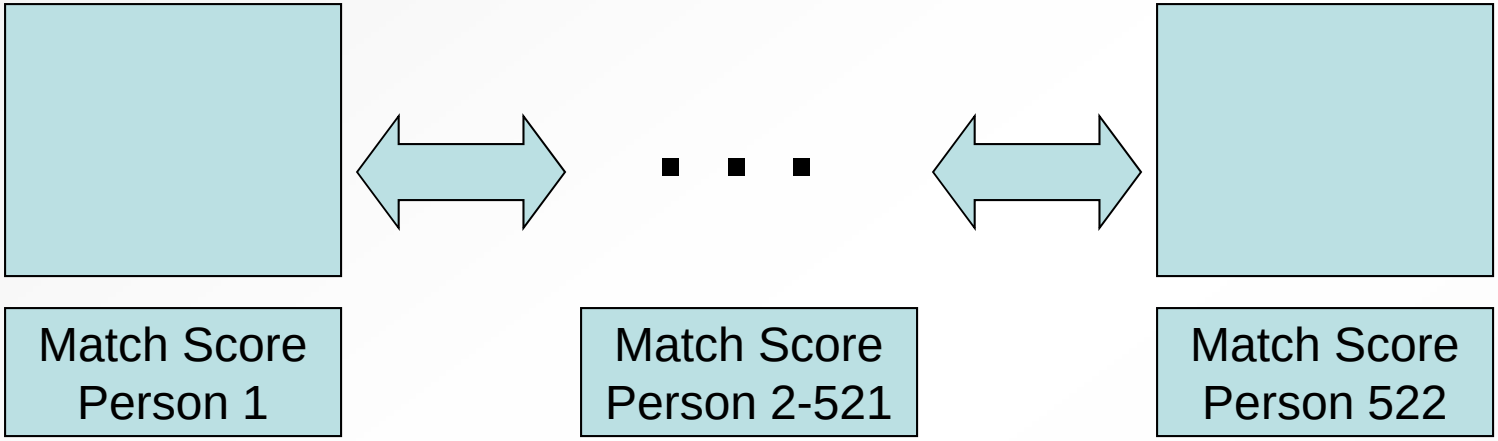
Images per Subject



The Data

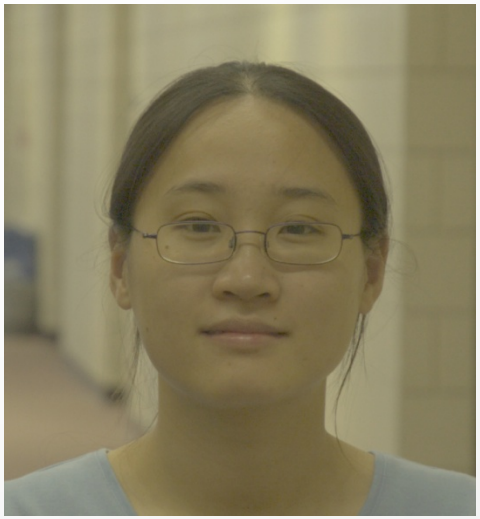

Similarity Matrix
Target
Query
. . .
Match Score
Person 1
Match Score
Person 2-521
Match Score
Person 522

The Data cont.

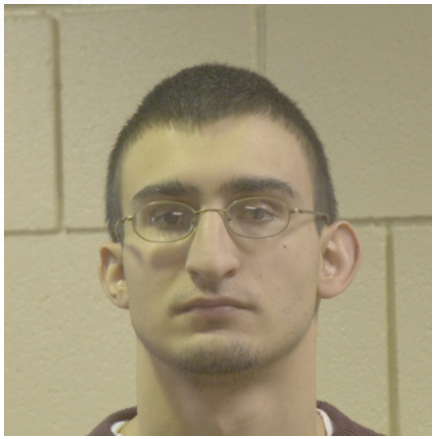


- Good: High scoring match pairs
- Bad: Average scoring match pairs
- Ugly: Low scoring match pairs.

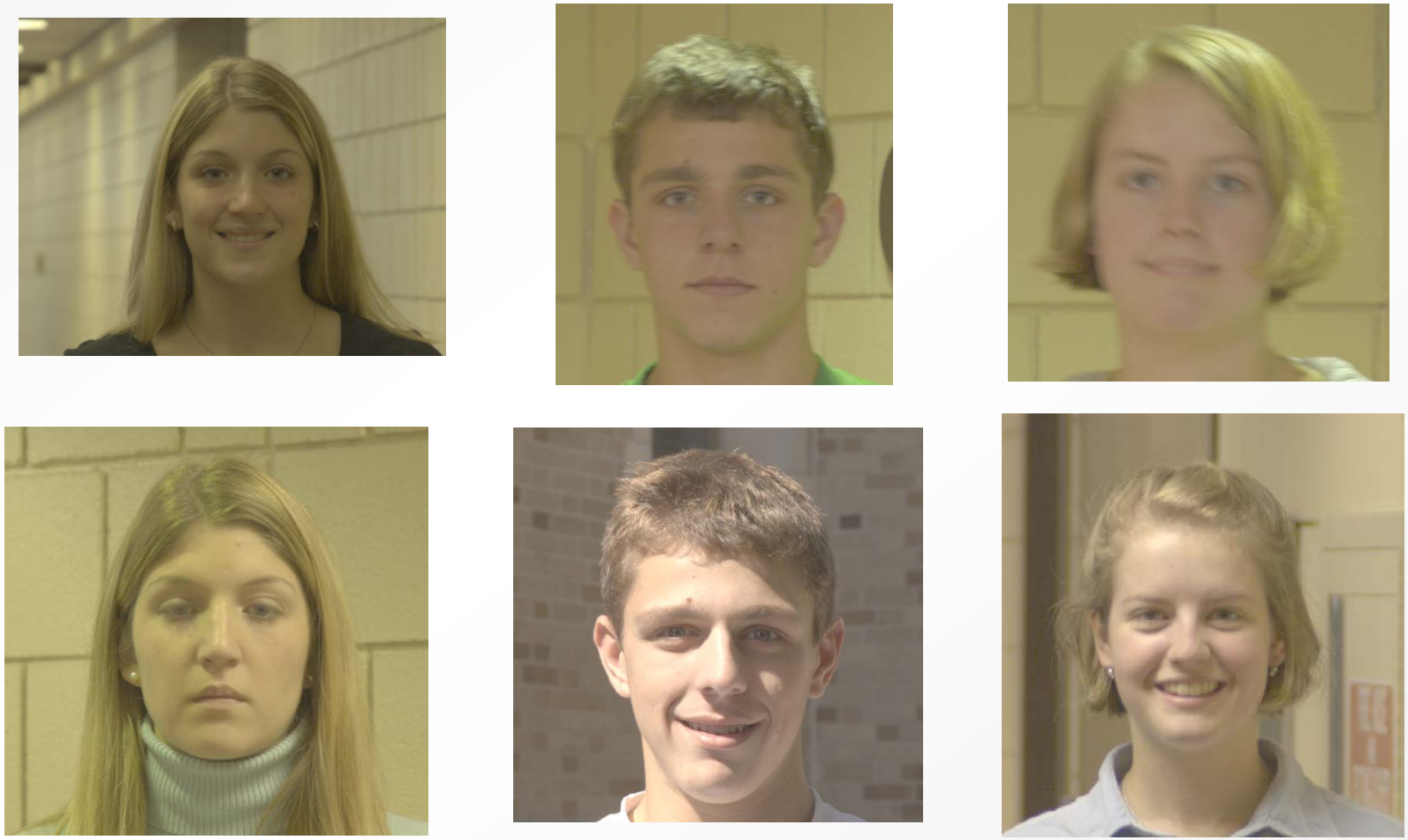
Good Face Pairs



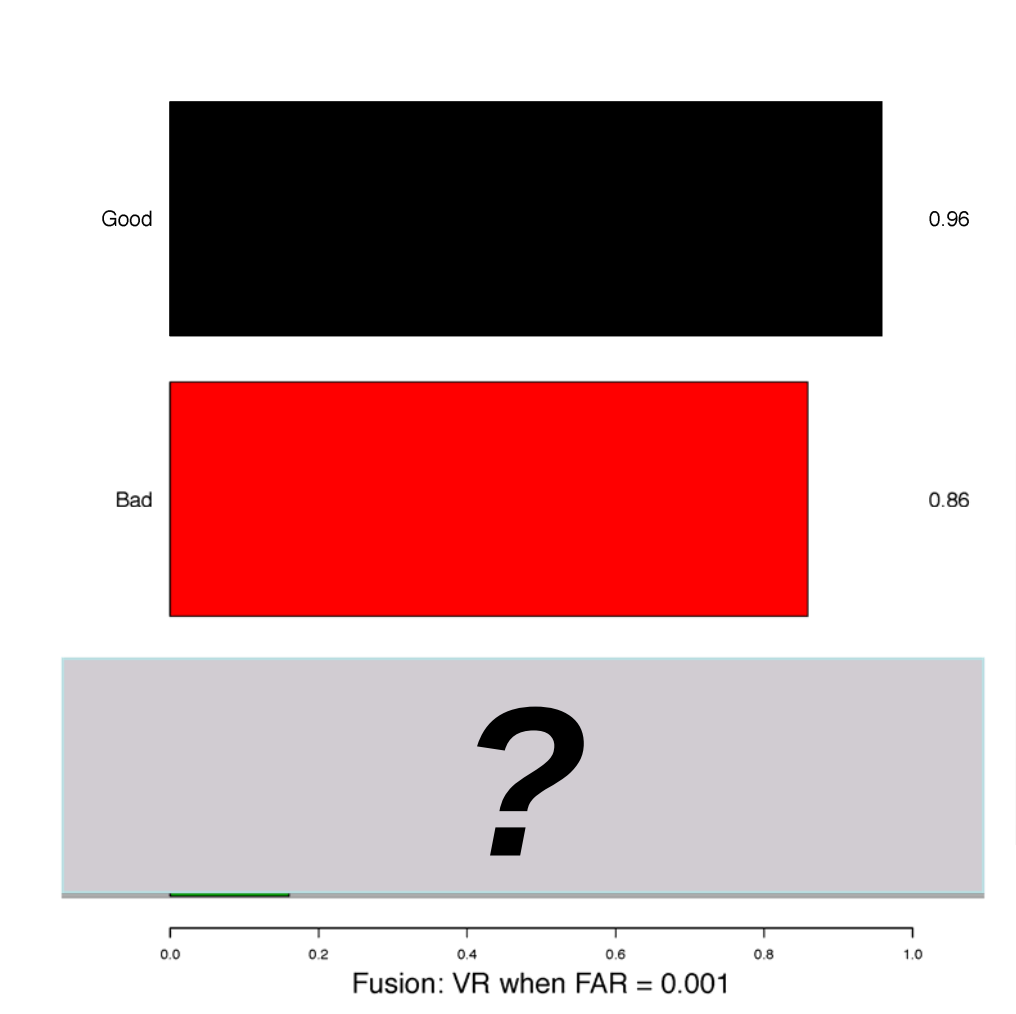
Bad Face Pairs



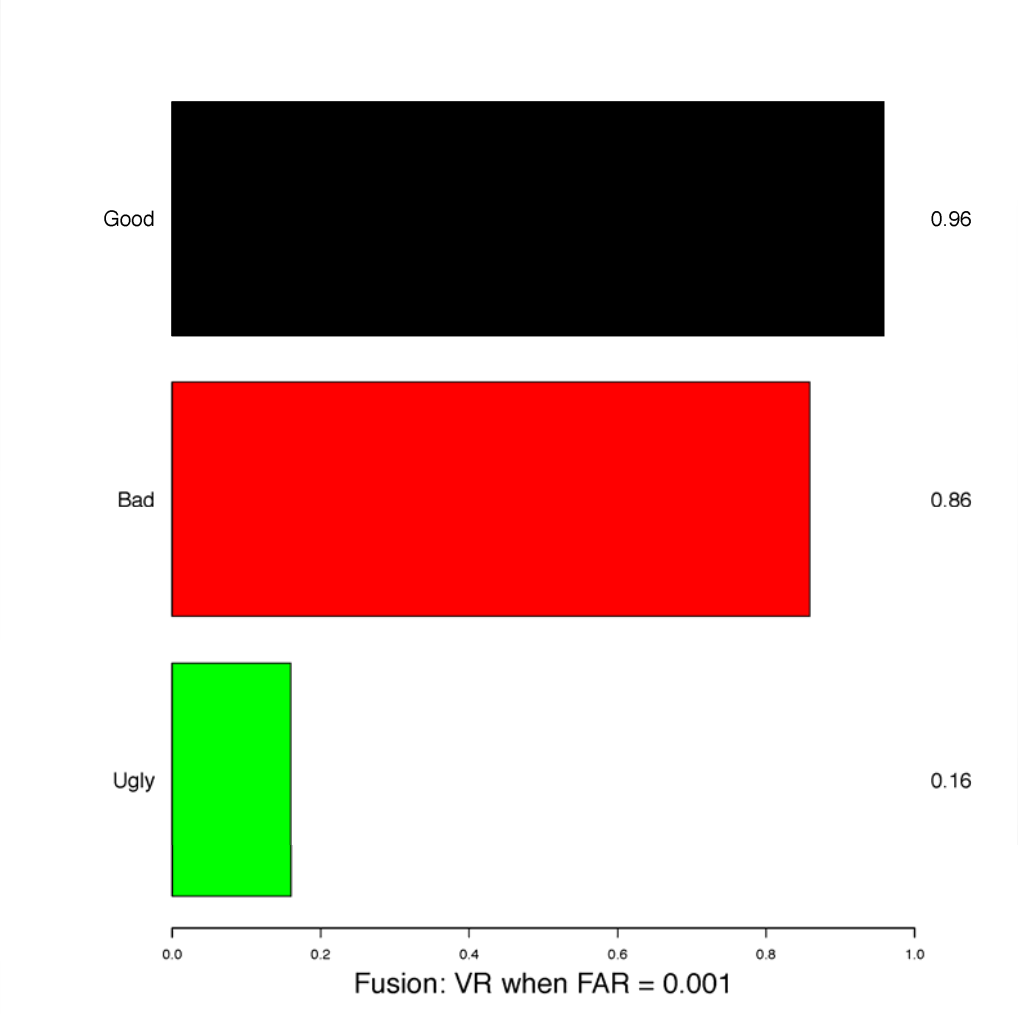
Very Challenging Face Pairs



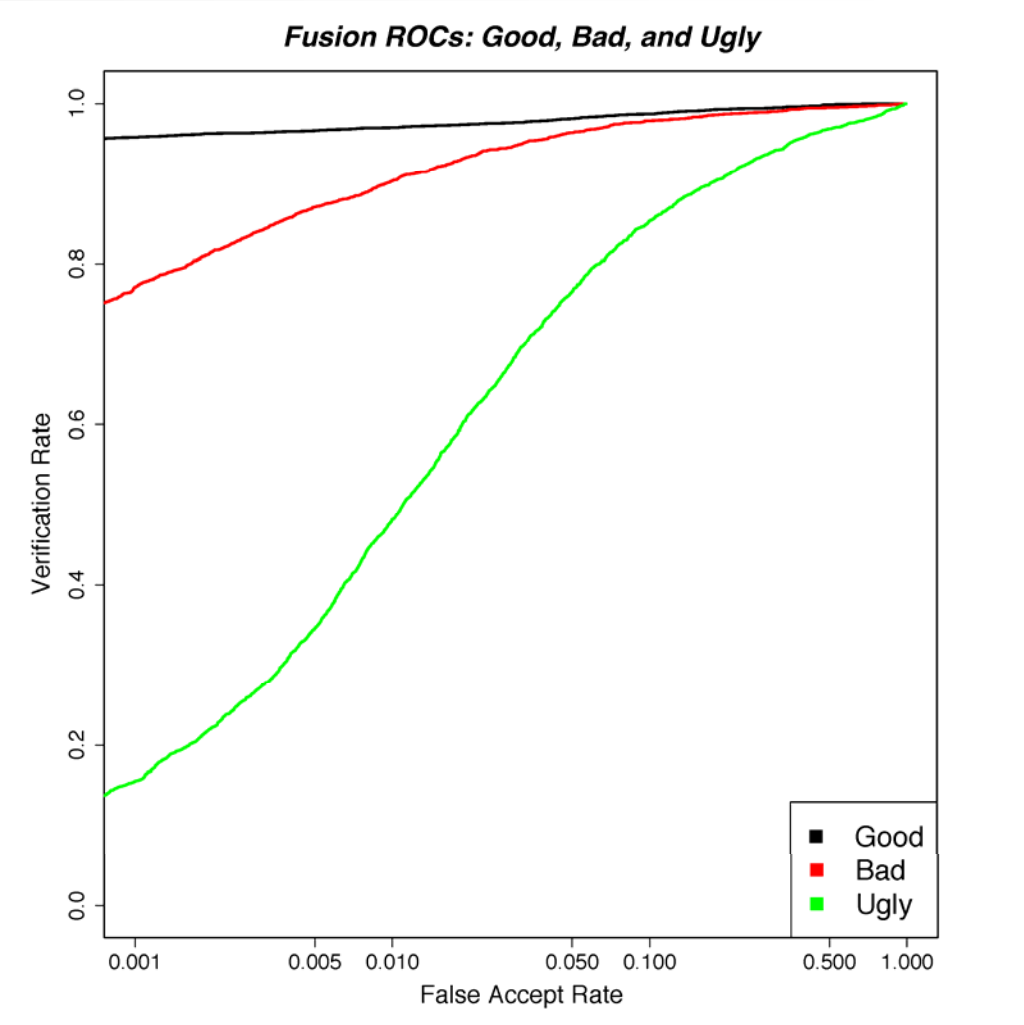
Good, Bad, Ugly Performance



Good, Bad, Ugly Performance



Good, Bad, & Ugly ROC



Good, Bad, Ugly Technique

- Method for defining data sets of varying difficulty
- Applies to other biometric data sets
- Extend to ICE 2006 data set (ND-04/05)

Region-based recognition

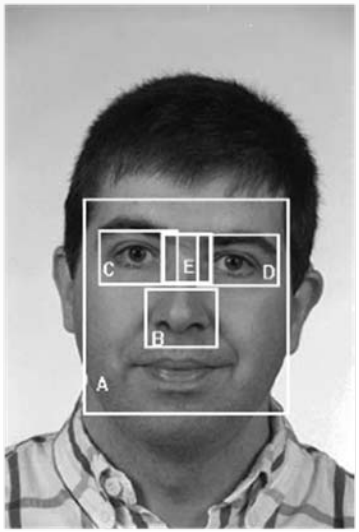


Figure 3.2: The facial features used. A is the interior the face. B is the tip of the nose. C and D are the left and right eyes. E is the bridge of the nose.

- Phillips, 1994, 1998
- Moghaddam & Pentland, 1994
- Jarudi & Sinha, 2003
- Kumar, Berg, Belhumeur, & Nayar, 2009

Summary-Face region

- Most important regions of the face
- Fusion across regions
- Robust to occlusion and pose
- Add region decomposition to GBU

Summary

- Plenty of challenges in face recognition
  - Non-frontal
  - Illumination
  - Cross mode
  - Face Regions
- All are relevant to real-world applications
- Good, Bad, & Ugly iris

Summary

- Data available to support challenges
- MBGCv2
  - Non-frontal still
  - Non-frontal video
  - Cross-mode
- Good, Bad, & Ugly
  - Ready for release
- Face Region
  - Based on existing challenge problems

MBGC

Multiple Biometric Grand Challenge

Multiple Biometric Evaluation (MBE) 2010 Update

04 December 2009

MBE 2010 Tracks

- .
- The Still Face Track
  - Reorganized
- Portal Track
  - Based on portal challenge problem
- Video Track
  - Based on video challenge problem

Still Face Track

- Large scale identification
  - 1 million+ face people
  - Potentially 3 million people
  - Motivated by NGI
  - Applicable to large scale identification systems
  - Lead: Patrick Grother
- Verification
  - Improvement in still face recognition under MBGC
  - Effects of compression and image resizing
  - Lead: Jonathon Phillips
- Organized as a single track

Questions addressed

- Effect of database size on performance
- Effect of multiple images of a person
- Effect of meta-data
  - Sex
  - Race
  - Date of Birth
  - Etc
- Application perspective
- Scientific analysis

Still face track—schedule

- 16 Nov 09: Initial draft evaluation plan released for comment
- 30 Nov 09: Comments due
- 9 Dec 09: Second draft evaluation plan released for comment
- 16 Dec 09: Comments due
- 18 Dec 09: Final evaluation plan released
- 26 Jan 09—14 May 10: Submission period
- Sept/Oct 20: Report(s) released

Portal and Video tracks

- Data is based on MBGC
  - Portal: 3,000+ portal sequences
  - Video: sequences similar to MBGC
- Executable protocol
  - Based on FRVT 2006 and ICE 2006
- Schedule
  - 15 Dec 09: Evaluation plan released
  - March 10: Evaluation starts
  - Fall 10: Report(s) released

Information

http://face.nist.gov/mbe

mbe2010@nist.gov