

Still Face Challenge Problem Multiple Biometric Grand Challenge Preliminary Results of Version 1

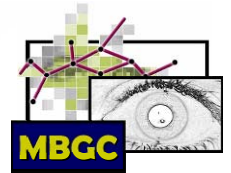
05 December 2008

National Institute of
Standards and Technology



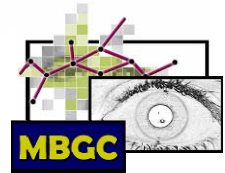
NIST

...working with industry to foster innovation, trade, security and jobs



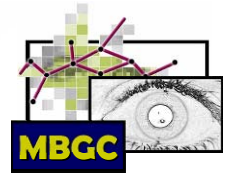
Still Face Background

- FRVT 2006
 - Verification rate = .99 at FAR = 0.001
 - Frontal
 - Controlled illumination
 - High resolution (400 pixels between the eyes)
 - Large scale laboratory collection



MBGC Still Face Goals

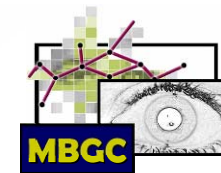
- Many applications of still face involve:
 - Unconstrained illumination
 - Low resolution (90-120 pixels between the eyes)
 - Compressed imagery (8KB to 20KB)
 - Non-frontal



MBGC Still Face Goals

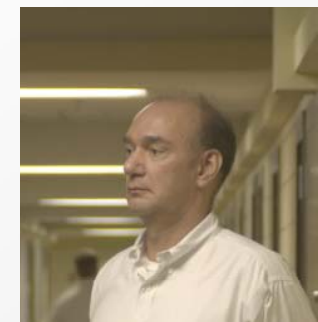
- Many applications of still face involve:
 - Unconstrained illumination
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 - Compressed imagery
 - Non-frontal

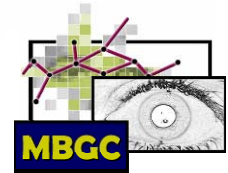
MBGC Still Face challenge problem addresses these constraints.



Still Face

- Two target sets – AY03-04 (FRGC)
 - Controlled illumination frontal
 - Uncontrolled illumination frontal
- One query set – AY04-05
 - Uncontrolled illumination frontal
 - Uncontrolled illumination non-frontal

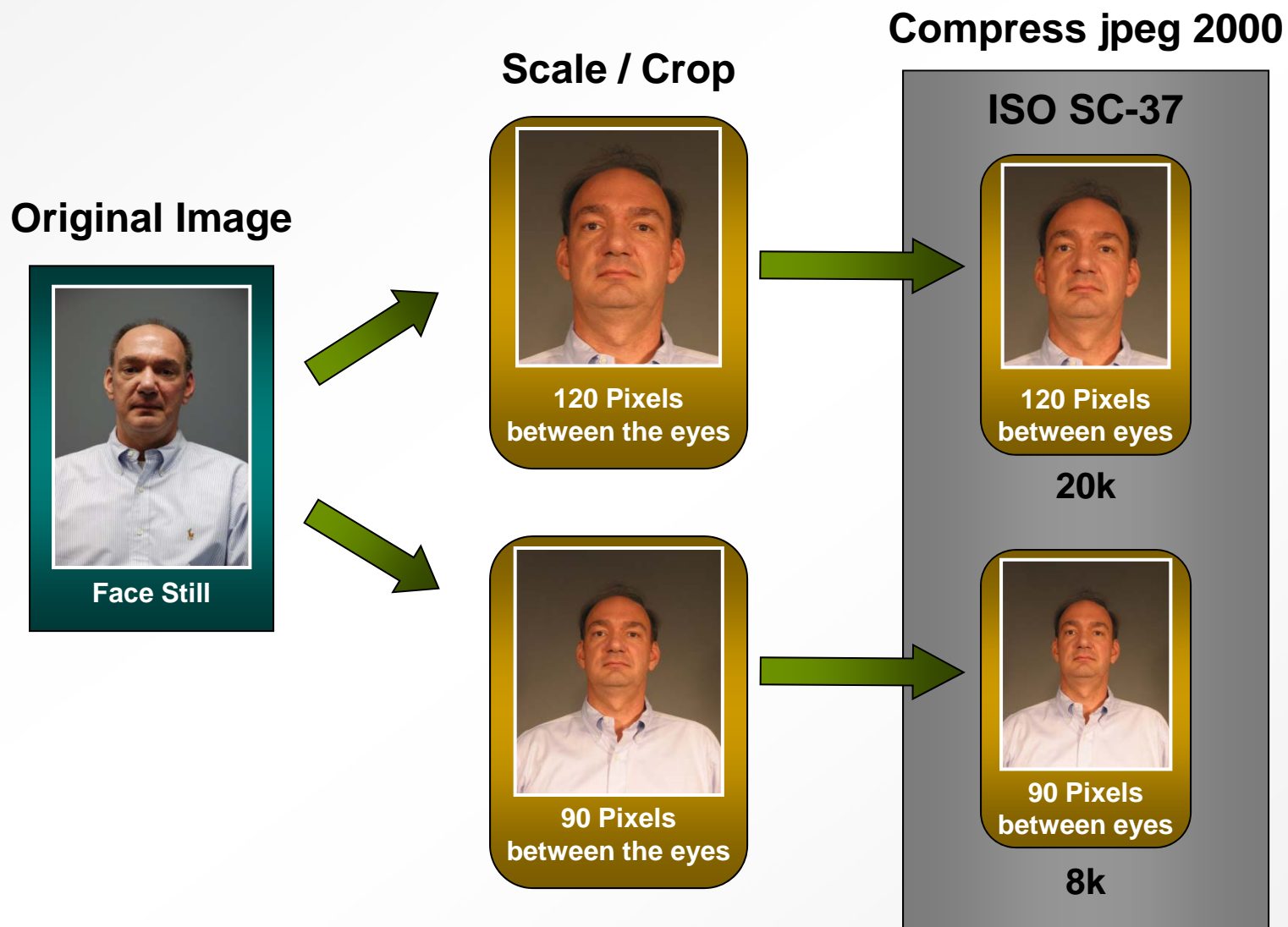


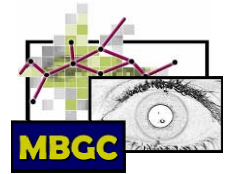


Effects of Lower Resolution and Compression on FR

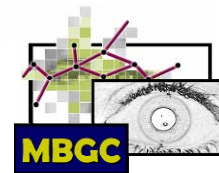
- Determine effect of
 - Lower resolution
 - Compression
- Process original images to meet data requirements
 - Scale and crop
 - 120 and 90 pixels between the eyes
 - Compress images
 - 20KB and 8KB

Still Face Processing





Results from Still Face Challenge Problem Version 1...



Participants

- Dalian University of Technology
- L-1 Identity Solutions AG
- Pittsburgh Pattern Recognition
- Cogent Inc.
- Toshiba Corporation

Legend

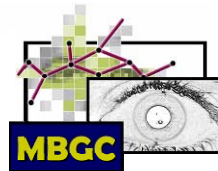
DUT

L1

PittPatt

Cogent

Toshiba



Frontal

vs.

Non-frontal

Controlled



Number of Stills

16,028

Uncontrolled



Number of Stills

8,014

Uncontrolled

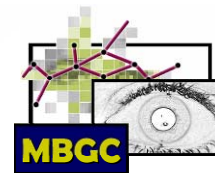


Number of Still Images

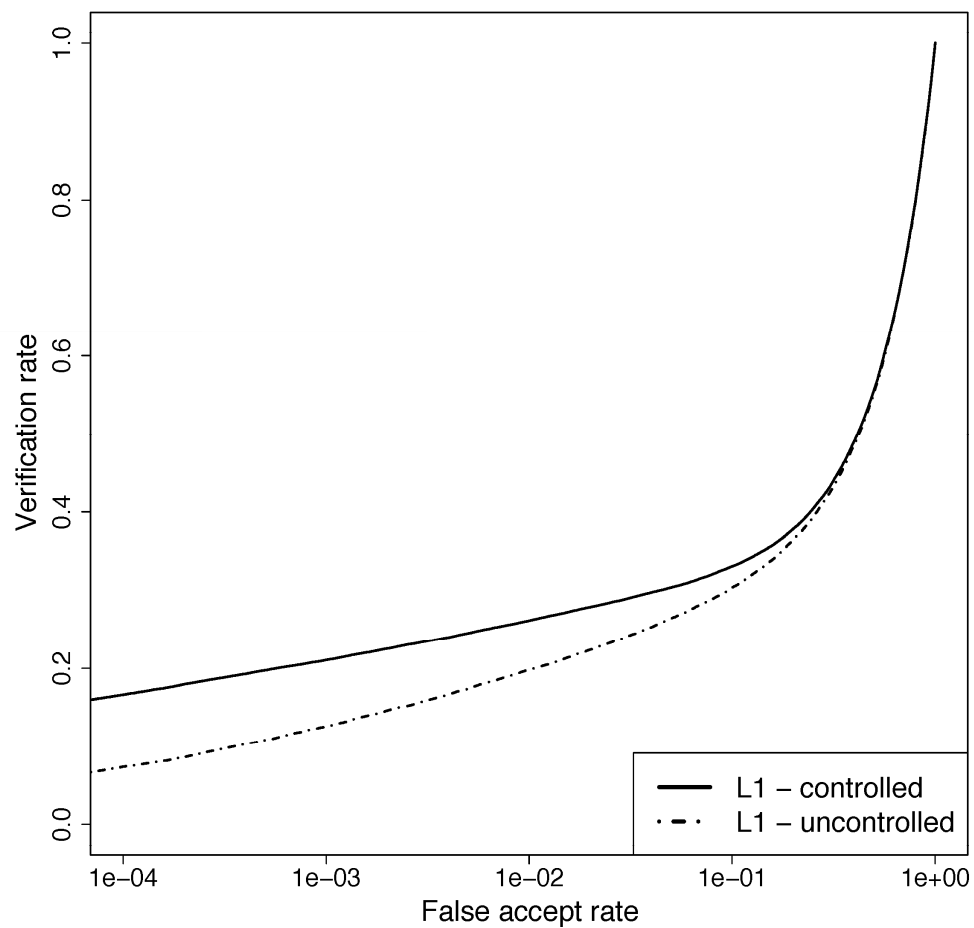
3,097

Uncontrolled

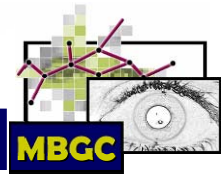




Frontal vs. Non-Frontal ROC



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



Controlled

vs.

Uncontrolled

Number of Images

16,028



Number of Images

10,687



No Compression

Compression

120 pixels

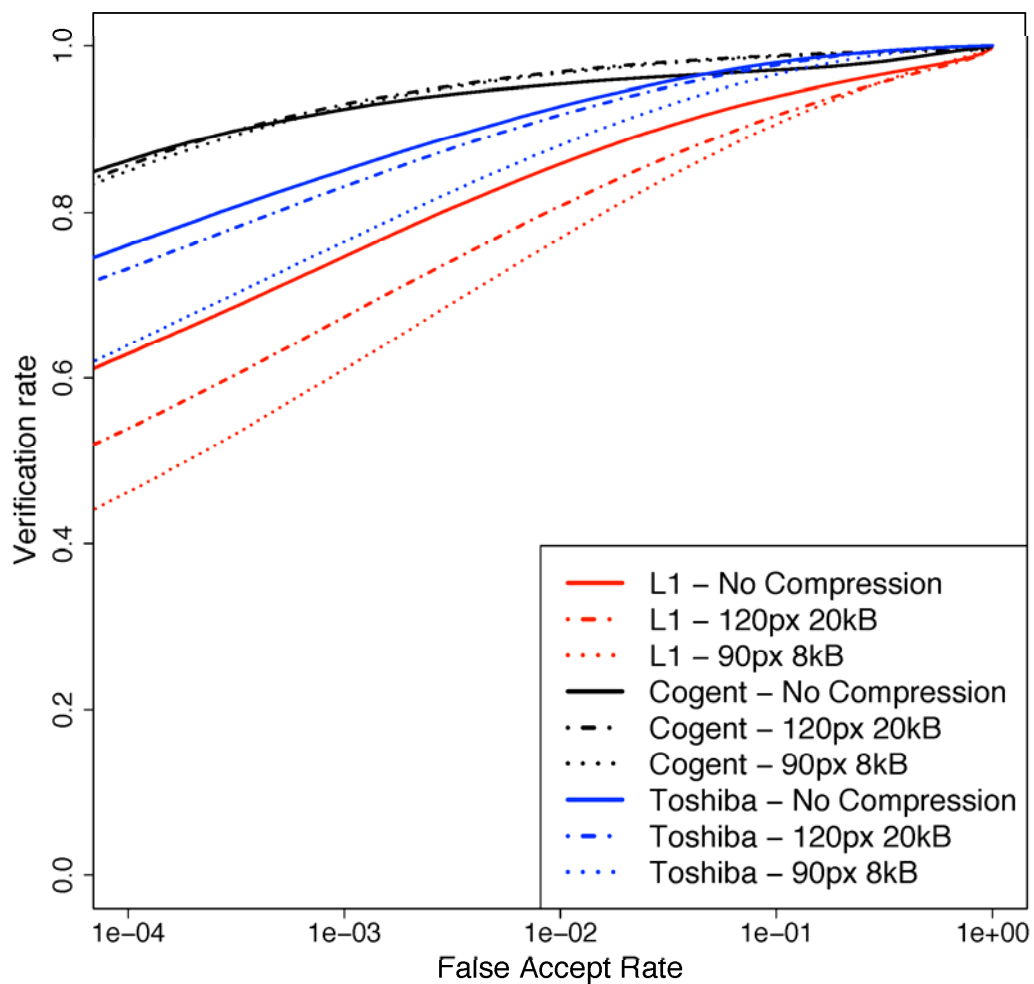
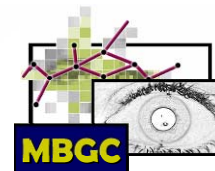
20 KB

Compression

90 pixels

8 KB

Controlled vs. Uncontrolled Frontal

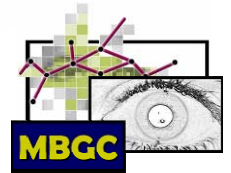


Results from an Open Book Challenge Problem, NOT an Independent Evaluation

Uncontrolled

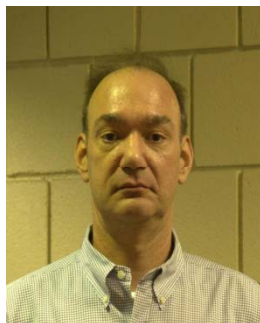
vs.

Uncontrolled



Number of Images

8,014



No Compression

Compression

120 pixels

20 KB

Compression

90 pixels

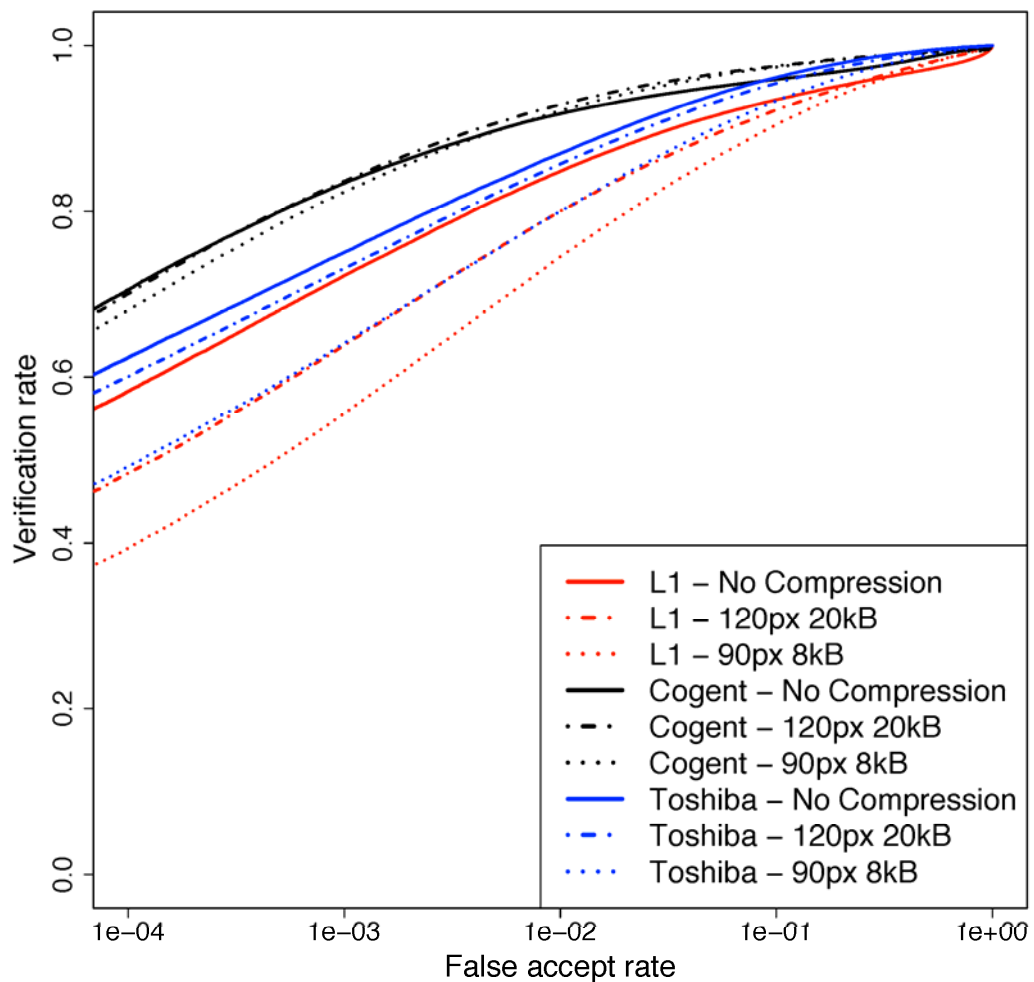
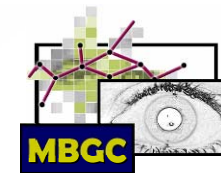
8 KB

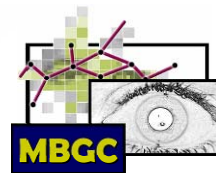
Number of Images

10,687

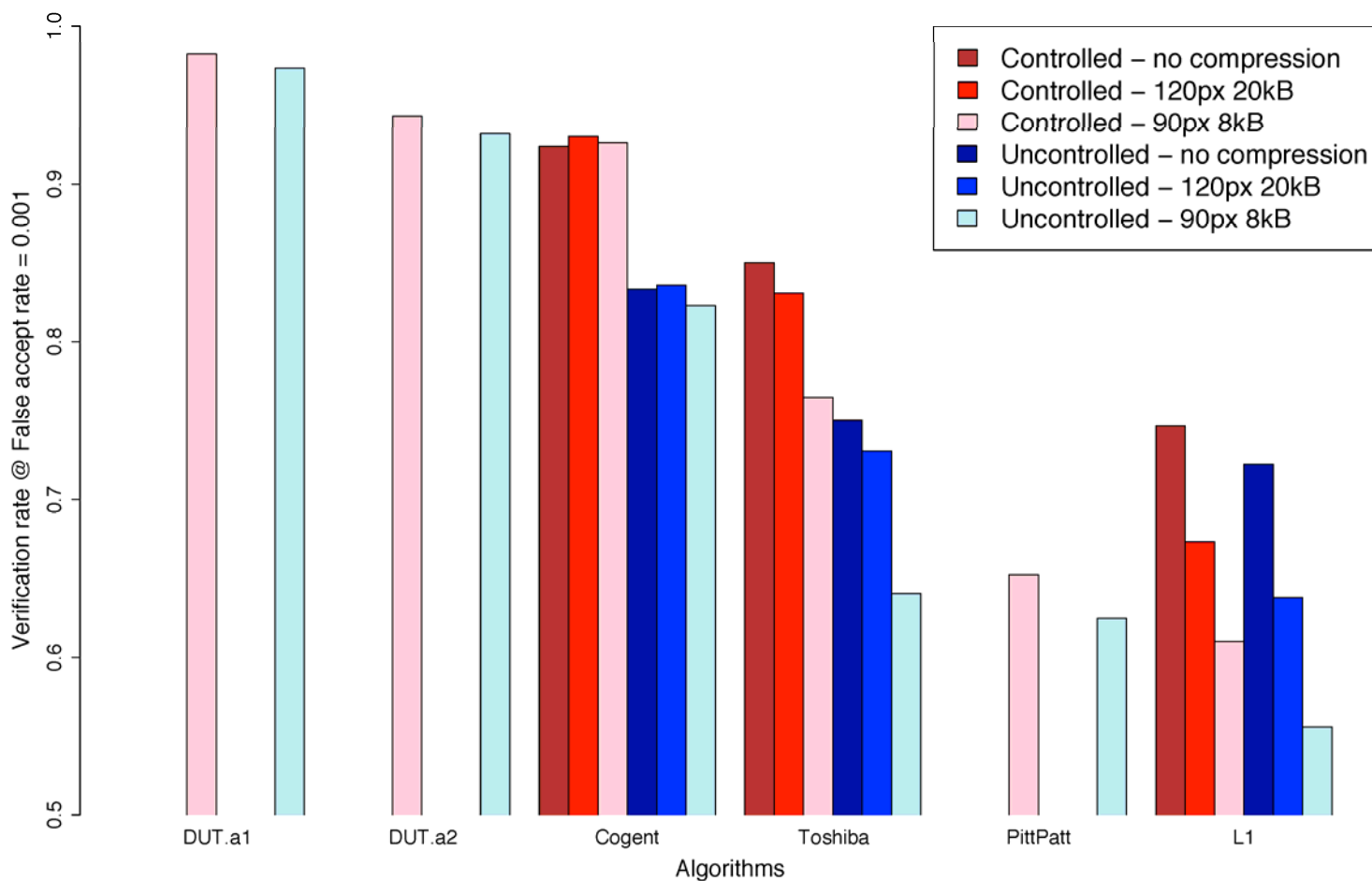


Uncontrolled vs. Uncontrolled Frontal ROC

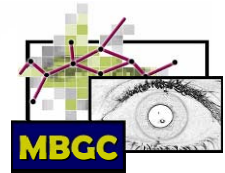




Summary Frontal



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



Conclusion

- Cross pose matching is very difficult.
- Performance on controlled images is easier than on uncontrolled.
- More studies are needed to characterize an algorithm's response to resolution and compression.