Multiple Biometric Grand Challenge
Third Workshop
04 December 2009
MBGC Sponsors

Executing Agency

- National Institute of Standards and Technology

Sponsoring Agencies

- Director of National Intelligence
  Intelligence Advanced Research Projects Activity
- Department of Homeland Security
  Science & Technology Directorate
- Federal Bureau of Investigation
  Criminal Justice Information Services
  Operational Technology Division
The MBGC Team

• NIST
  – Test Director, Dr. P. Jonathon Phillips
• Colorado State University
  – Prof. Ross Beveridge, Prof. Geof Givens, Prof. Bruce Draper, David Bolme, Yui Man Lui, Nayeem Teli
• SAIC
  – Dr. Todd Scruggs, Dr. Grace E. Cho
• Schafer Corporation
  – Jay Scallan
• University of Notre Dame
  – Prof. Kevin Bowyer & Prof. Patrick Flynn
• University of Texas at Dallas
  – Prof. Alice O’Toole
Overview

• MBGC Overview
• Results MBGC Version 2.0 Part 1
  – Still Face
  – Video
• Talk & Lunch
• Results MBGC Version 2.0 Part 2
  – Portal
• Future Challenges
• Multiple Biometric Evaluation 2010
Challenge Problems

• What are challenge problems?
  – A series of experiments designed to advance a technology’s state-of-the-art

  • Experiments designed
  • Experiments and test data distributed to researchers
  • Researchers complete experiments and submit results
  • Scores are consolidated and reported

  – Introduction of new technology
Ideal Challenge Problem

Progress / Performance

Time / Effort / $

Today

Time

Difficulty

Challenge Problem
Technology Progress

- 17 Years
- 7 Evaluations
- 5 Challenge Problems (Technology Development)
- 3 Biometrics
- 150,000+ Facial and Iris Images
Improved FR Performance

Face Recognition Error Rate

Year of Evaluation

- 1993: Turk & Pentland (Partially Automatic)
- 1997: FERET 1996 (Fully Automatic)
- 2002: FRVT 2002 (Fully Automatic)
- 2006: FRVT 2006 (Fully Automatic)

Single Still Controlled Different Days
MBGC Challenge Problems

Portal Video

Video

Still Face

Mugshot

ICAO-ISO Standard
MBGC Goal

- The main goal of the Multiple Biometric Grand Challenge (MBGC) is to
  
  - Address face and iris recognition problems that are more relevant to those found in operational data
    
    - Low to medium resolution face
    
    - Still and video iris
    
    - Near Infrared (NIR) & High Definition (HD) video from portals
    
    - Unconstrained recognition from still & video
MBGC Goal

- Programmatic method

  - Sequence of challenge problems

    - Modeled after the FRGC and ICE 2005

    - Challenge problems and data distributed to researchers

  - Workshops

  - Multiple Biometric Evaluation 2010
## Timeline

- **Estimated task schedule for MBGC:**

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 2007</td>
<td>Formal announcement of MBGC project</td>
</tr>
<tr>
<td></td>
<td>Begin data collection at University of Notre Dame</td>
</tr>
<tr>
<td></td>
<td>Design protocols, challenge problems and prepare test infrastructure</td>
</tr>
<tr>
<td>April 2008</td>
<td>1st MBGC Workshop</td>
</tr>
<tr>
<td></td>
<td>Release 1st challenge problem</td>
</tr>
<tr>
<td>December 2008</td>
<td>2nd MBGC Workshop</td>
</tr>
<tr>
<td></td>
<td>Results Challenge Problem Version 1</td>
</tr>
<tr>
<td>May 2009</td>
<td>Release Challenge Problem Version 2</td>
</tr>
<tr>
<td>December 2009</td>
<td>3rd MBGC Workshop</td>
</tr>
<tr>
<td></td>
<td>Results Challenge Problem Version 2</td>
</tr>
</tbody>
</table>
MBGC Implementation

• MBGC Team
  – Collect and prepare data
  – Define challenge problems
  – Develop challenge problem protocols
  – Prepare data for distribution
  – Score submitted results

• Participants
  – Develop technology and algorithms
  – Submit self reported similarity matrices for challenge problems.
MBGC Participation to Date

- Organizations given access to MBGC data. 78
- Organizations submitting results for MBGC version 2.0. 13
- Both industry and academic organizations participated
  - Industry 8
  - Academic 5
- Countries
  - China
  - France
  - Germany
  - Japan
  - Lithuania
  - United Kingdom
  - United States
MBGC Version 2 Results

- Challenge problems released late spring 2009.
- Results were submitted in November 2009.
  - Portal 2 November
  - Video 9 November
  - Still Face 16 November
- Similarity matrices submitted.
- Similarity matrices are self reported.
- These matrices represent participants best efforts.
Challenge problem assessments

- Provides snapshot at one date
  - MBGC v2: Beginning of November 2009
- Power from multiple results
- Reasonable assessment
Summary

• Solid Progress
  – Frontal Face
  – Portal

• Challenge areas identified.