Video Challenge Problem
Multiple Biometric Grand Challenge
Preliminary Results of Version 2

04 December 2009
Goals and Motivations

• Operational environment
  – Recognition from video.
  – Unconstrained illumination.
  – Unconstrained movement / pose.
Meet the Data
University of Notre Dame

- Two different mediums of video.
  - High definition video (1440 x 1080)
  - Standard definition video (720 x 480)
Meet the Data
University of Texas at Dallas
Both Data Sets Contain

- **Walking footage**
  - Subject walks towards camera.

- **Activity / Conversation footage**
  - Non-frontal footage of subject performing an activity / conversation.
Video Challenge Submissions

<table>
<thead>
<tr>
<th>Organization</th>
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<td>Pittsburgh Pattern Recognition</td>
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Walking vs. Walking

Notre Dame
976 sequences

Standard Definition
976 sequences

Notre Dame
976 sequences

Standard Definition
976 sequences
University of Texas at Dallas
Walking vs. Walking

487 sequences
Walking vs. Walking Results

Results from an Open Book Challenge Problem, NOT an Independent Evaluation
Walking vs. Activity
Activity vs. Activity

Walking
976 sequences

Activity
784 sequences

Activity
784 sequences

Activity
784 sequences

Experiment uses both high definition and standard definition.
Walking vs. Activity ROC
Activity vs. Activity ROC

Results from an Open Book Challenge Problem, NOT an Independent Evaluation
Walking vs. Activity ROC
Activity vs. Activity ROC

Reigning Champions from MBGC V1 2008

Results from an Open Book Challenge Problem, NOT an Independent Evaluation
University of Texas at Dallas
Walking vs. Conversation
Conversation vs. Conversation

487 sequences
482 sequences

NO SUBMISSIONS
Human Benchmarking with Video
Information in Surveillance Video

What is helpful for recognition?

- multiple images of face
- multiple images of body

- dynamic information about gait
  - “dynamic identity signatures”

- facial motion
Walking - Walking

• Human subject raters respond…
  – 1. sure they are the same person
  – 2. think they are the same person
  – 3. not sure
  – 4. think they are not the same person
  – 5. sure they are not the same person
UT Dallas—Walking to Walking

Verification rate vs False accept rate for Algorithm—PittPatt and Human.
Walking - Conversation

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Performance All Video Conditions

Human Performance on Video Face Challenge

- Conversation Conversation
- Conversation Walking
- Walking Walking

Verification rate vs. False accept rate
Human Performance Face Stills

- Human subject raters respond...
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  - 5. sure they are not the same person
Video and Still

Human Performance on FRGC, FRVT 2006, and Video Face Challenge

Verification rate vs. False accept rate

- FRVT 2006 High Res
- FRVT 2006 Very High Res
- FRGC Difficult Still Face
- FRGC Easy Still Face
- Conversation Conversation
- Conversation Walking
- Walking Walking
There is Head Room
Summary

- New challenges
- Algorithms cannot handle non-frontal activity
- Human benchmark