MBGC

Multiple Biometric Grand Challenge

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

04 December 2009

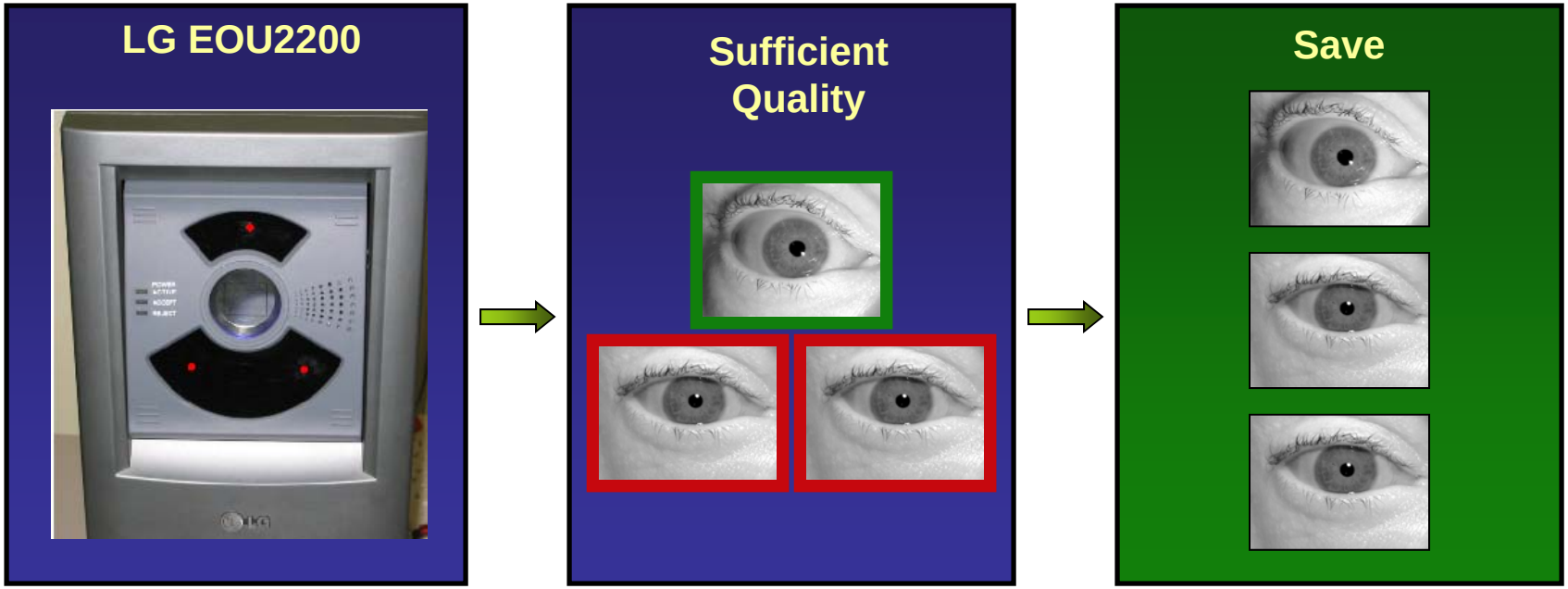
Portal Challenge Goals

- Develop multi-modal algorithms
  - Iris, face, video
- Robust
  - Failure to acquire
  - Non-ideal biometric samples
- Portal technology
  - Stand off screening
  - Improving this class of applications

Meet the Sensors….

Meet the LG 2200

MBGC Iris Acquisition System



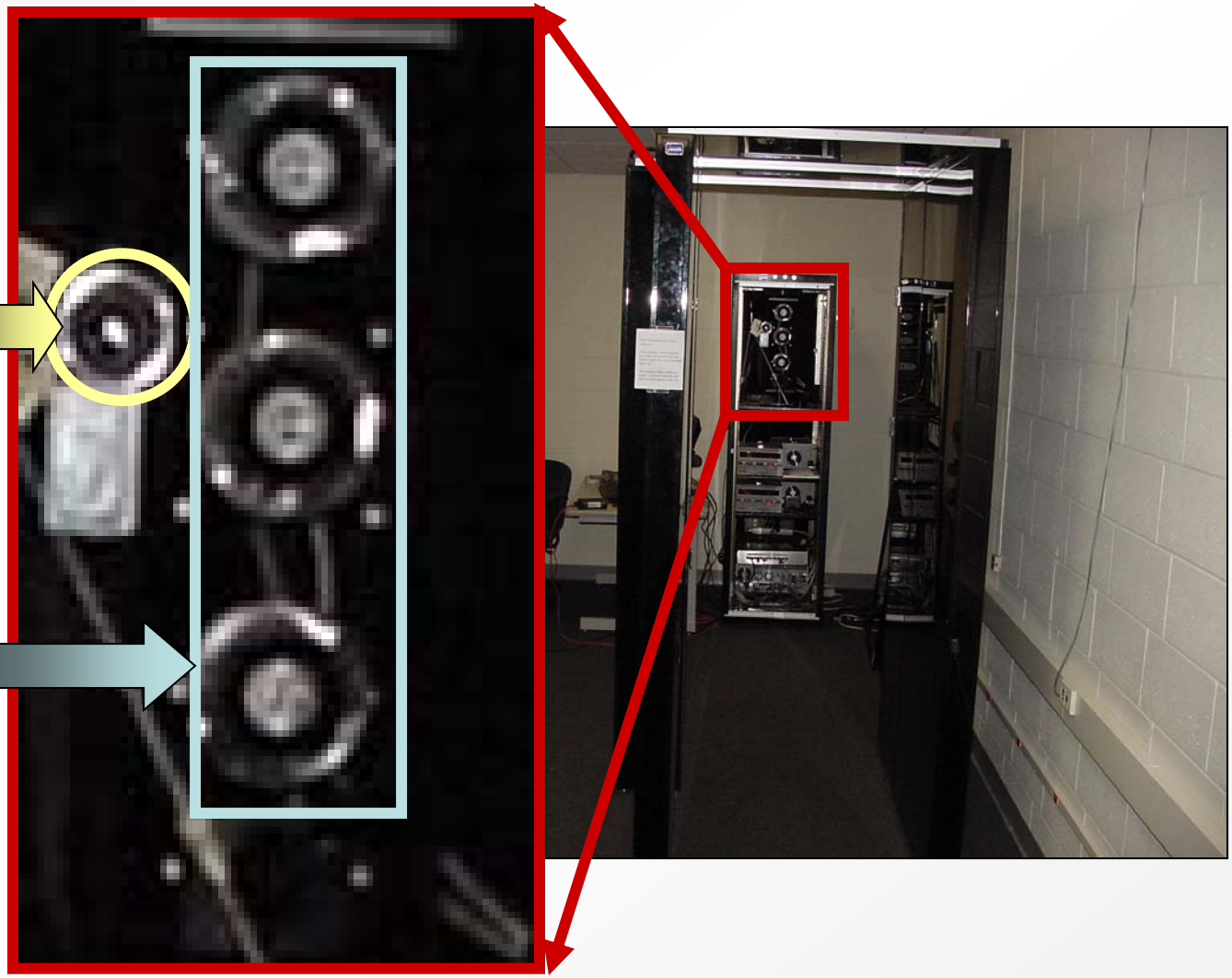
- Take 3 iris images
- One above quality threshold
- Save all three

Meet the Portal

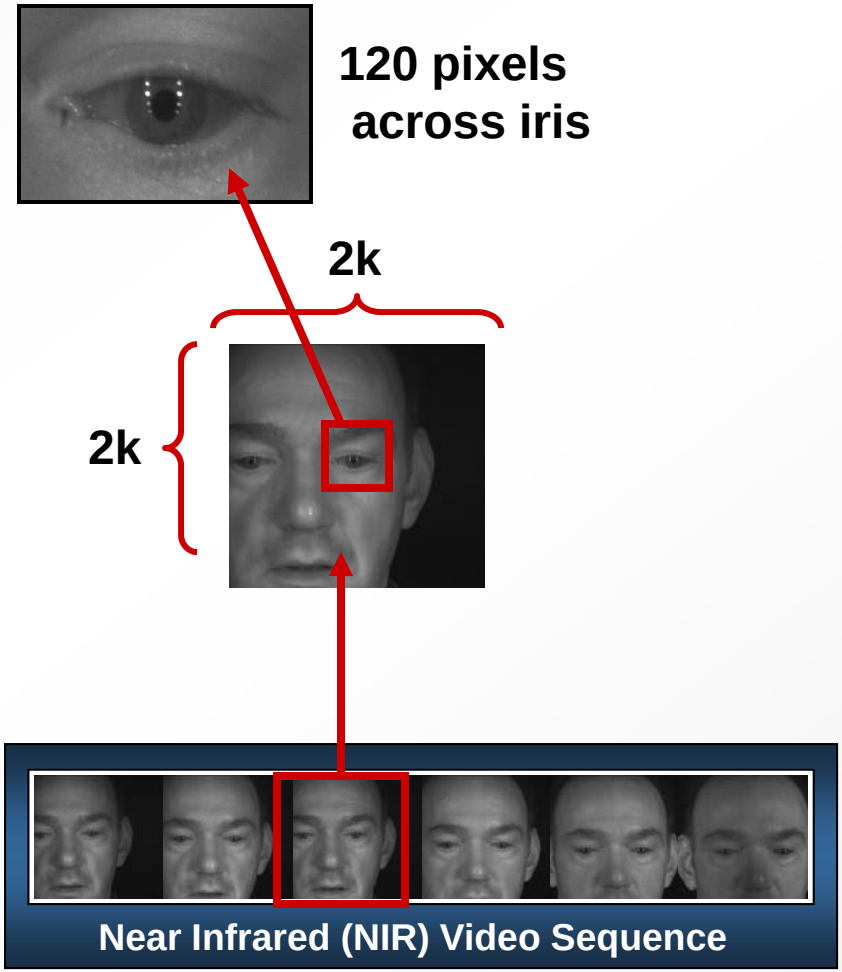
Meet the Portal

High Definition (HD) Video Camera

Near Infrared (NIR) Video Cameras



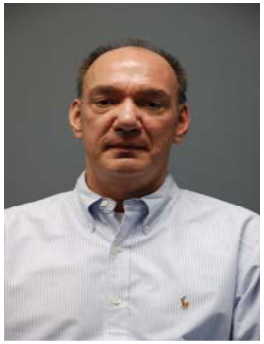
Meet the Portal

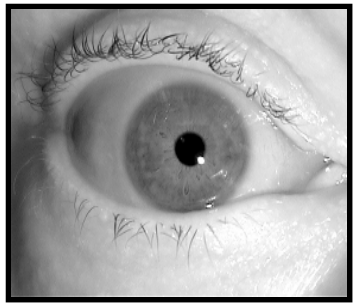


Meet the Experiments….

Target Data Samples

Query Data Samples





Experiment:
Still Face Images vs. HD Video

Controlled Face Still

1426 Images

Matching

High Definition (HD) Video Sequence

512 Sequences

Uncontrolled Face Still

1785 Images

Matching

High Definition (HD) Video Sequence

512 Sequences

Target Query

Experiment:
Still Face Images vs. NIR Video

Controlled Face Still

1426 Images

Matching

Near Infrared (NIR) Video Sequence

571 Sequences

Uncontrolled Face Still

1785 Images

Matching

Near Infrared (NIR) Video Sequence

571 Sequences

Target Query

Experiment:
Iris Stills vs. NIR Video

Iris Stills

4025 Images

Matching

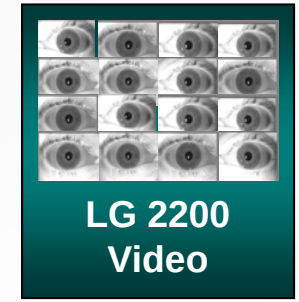
Near Infrared (NIR) Video Sequence

571 Sequences

Target

Query

Experiment:
Iris Videos vs. NIR Portal Video



LG 2200 Video

450 Sequences

Matching

Near Infrared (NIR) Video Sequence

571 Sequences

Target

Query

Experiment:
Controlled Face & Iris Still vs. HD & NIR Video

Iris Stills

Controlled Face Still

11,442 Images

Matching

Near Infrared (NIR) Video Sequence

High Definition (HD) Video

562 Sequences

Target

Query

Experiment:
Uncontrolled Face & Iris Still vs. HD & NIR Video

Iris Stills

Uncontrolled Face Still

14,115 Images

Matching

Near Infrared (NIR) Video Sequence

High Definition (HD) Video

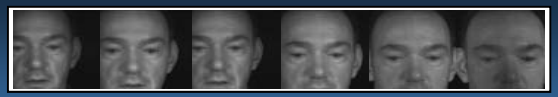
562 Sequences

Target

Query

Face Still

Face Stills vs. HD Video / NIR Video



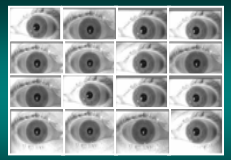
Near Infrared (NIR) Still

High Definition (HD) Video

Iris Still

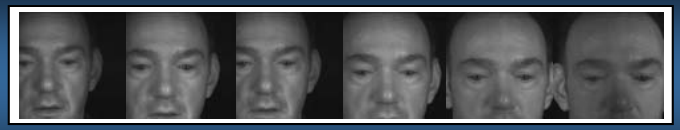
Iris Stills vs. NIR Video

Near Infrared (NIR) Video Sequence



Iris Video

Iris Video vs. NIR Video



Near Infrared (NIR) Video Sequence

Face Still

Iris Still

Fusion:

Still Face & Iris Stills vs. NIR & HD

Near Infrared (NIR) Still

High Definition (HD) Video

Target Query

List of participants

Organizations

Clarkson, West Virginia, Tennessee Knoxville, CITeR

Cognitec

Dalian University of Technology

Lockheed Martin

Neurotechnology

Pittsburgh Pattern Recognition

Sagem Sécurité

University of Surrey

TELECOM SudParis

Toshiba Corporation

Vilnius University

And now the results of the MBGC V2 Portal Challenge….

Experiment:
Still Face Images vs. HD Video

Controlled

Face Still

1426 Images

Matching

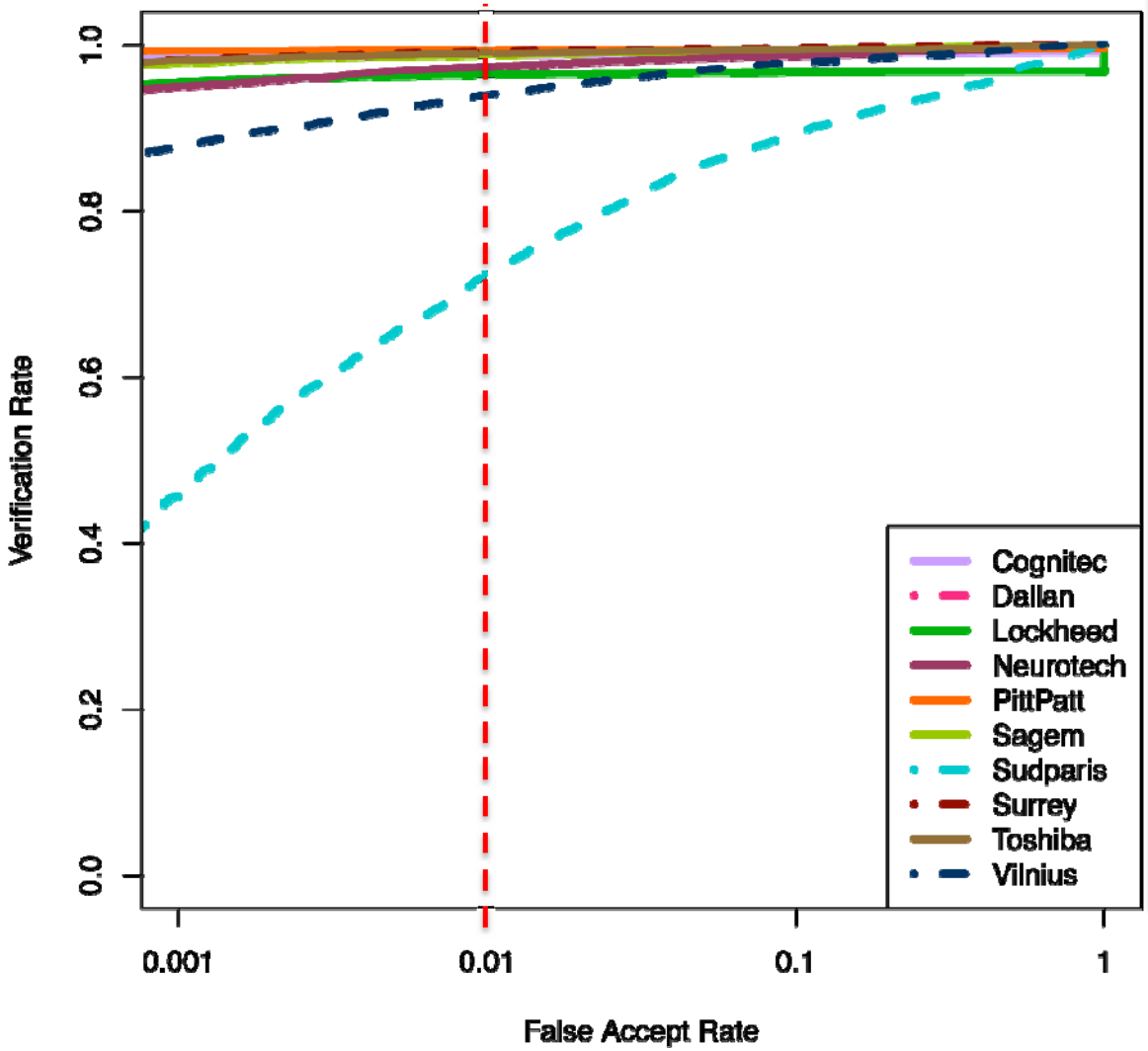
High Definition (HD) Video Sequence

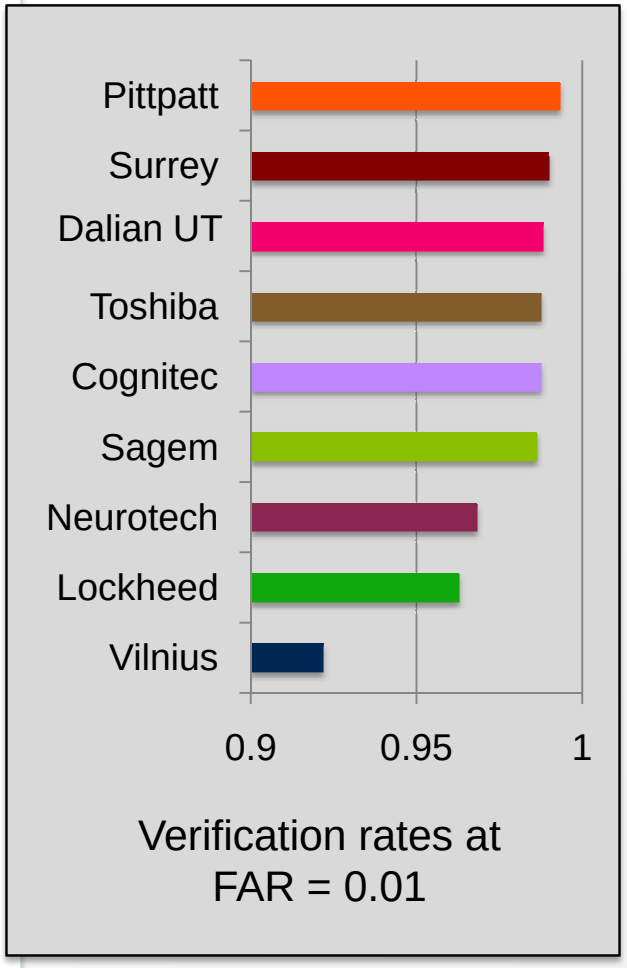
512 Sequences

Target

Query

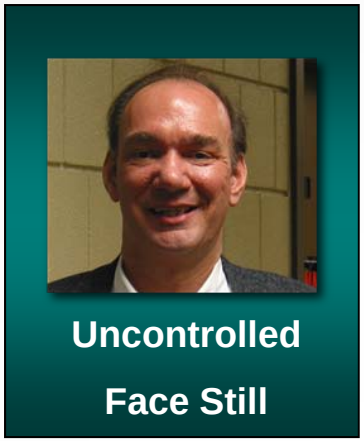
Experiment – Controlled Face vs. HD





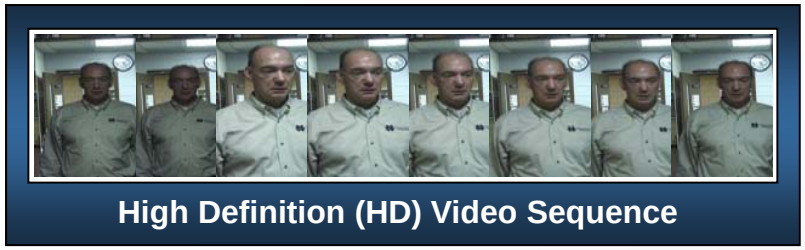
Results from an Open Book Challenge Problem, NOT an Independent Evaluation

Experiment:
Still Face Images vs. HD Video



1785 Images

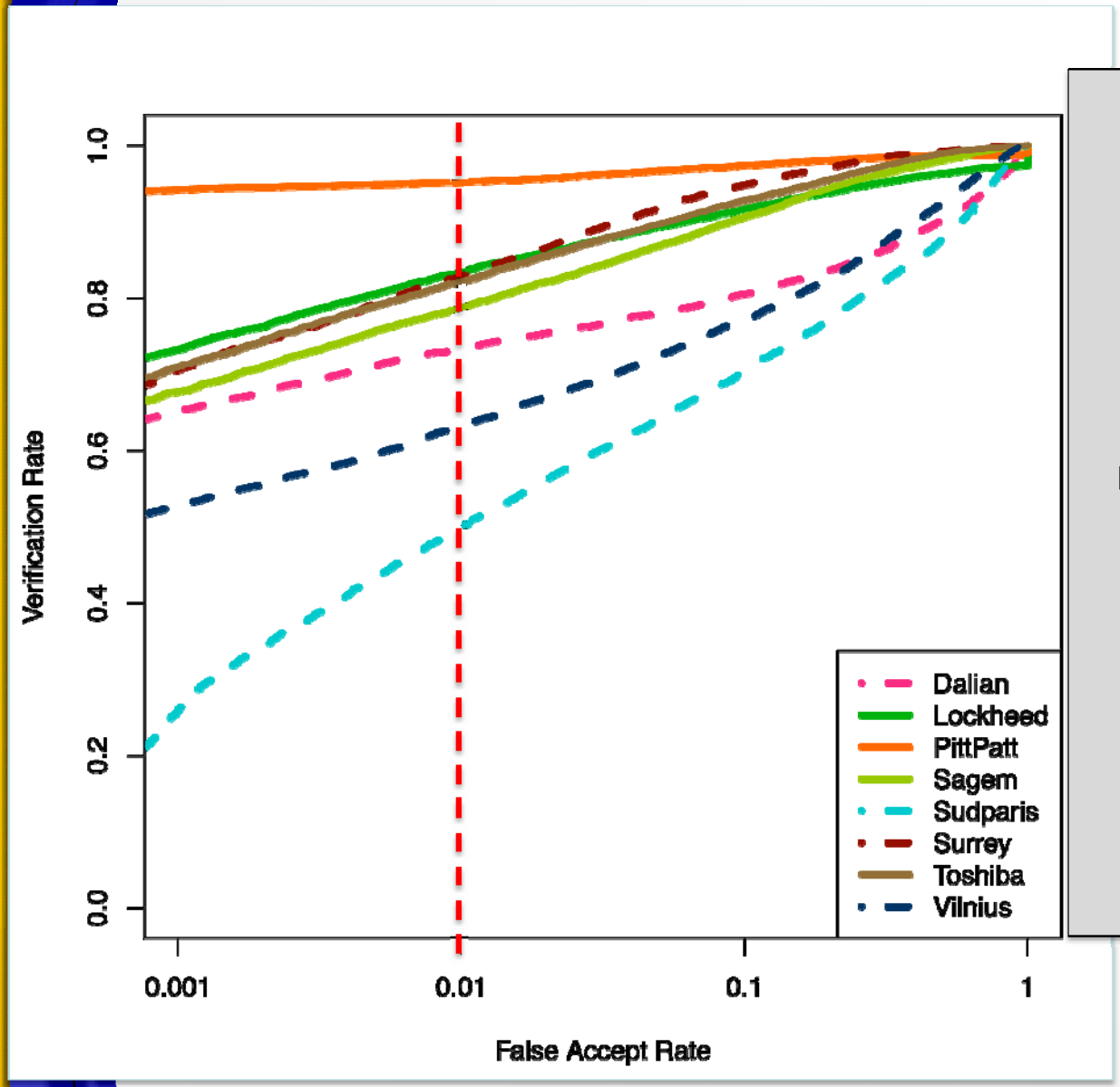
Matching

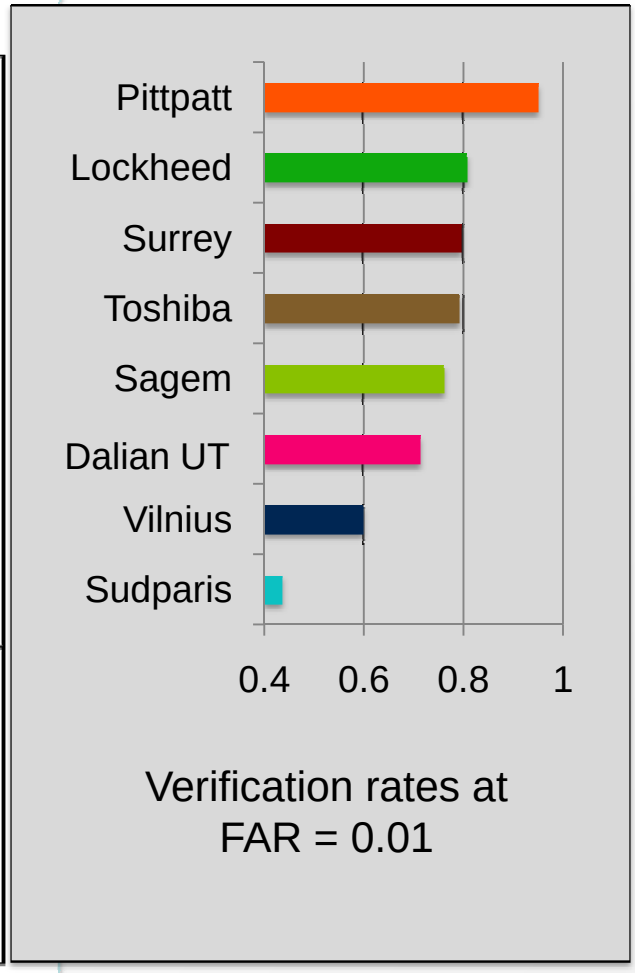


512 Sequences

Target Query

Experiment – Uncontrolled Face vs. HD





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

Experiment:
Visible Light Images vs. NIR Video

Controlled

Face Still

1426 Images

Matching

Near Infrared (NIR) Video Sequence

571 Sequences

Uncontrolled

Face Still

1785 Images

Matching

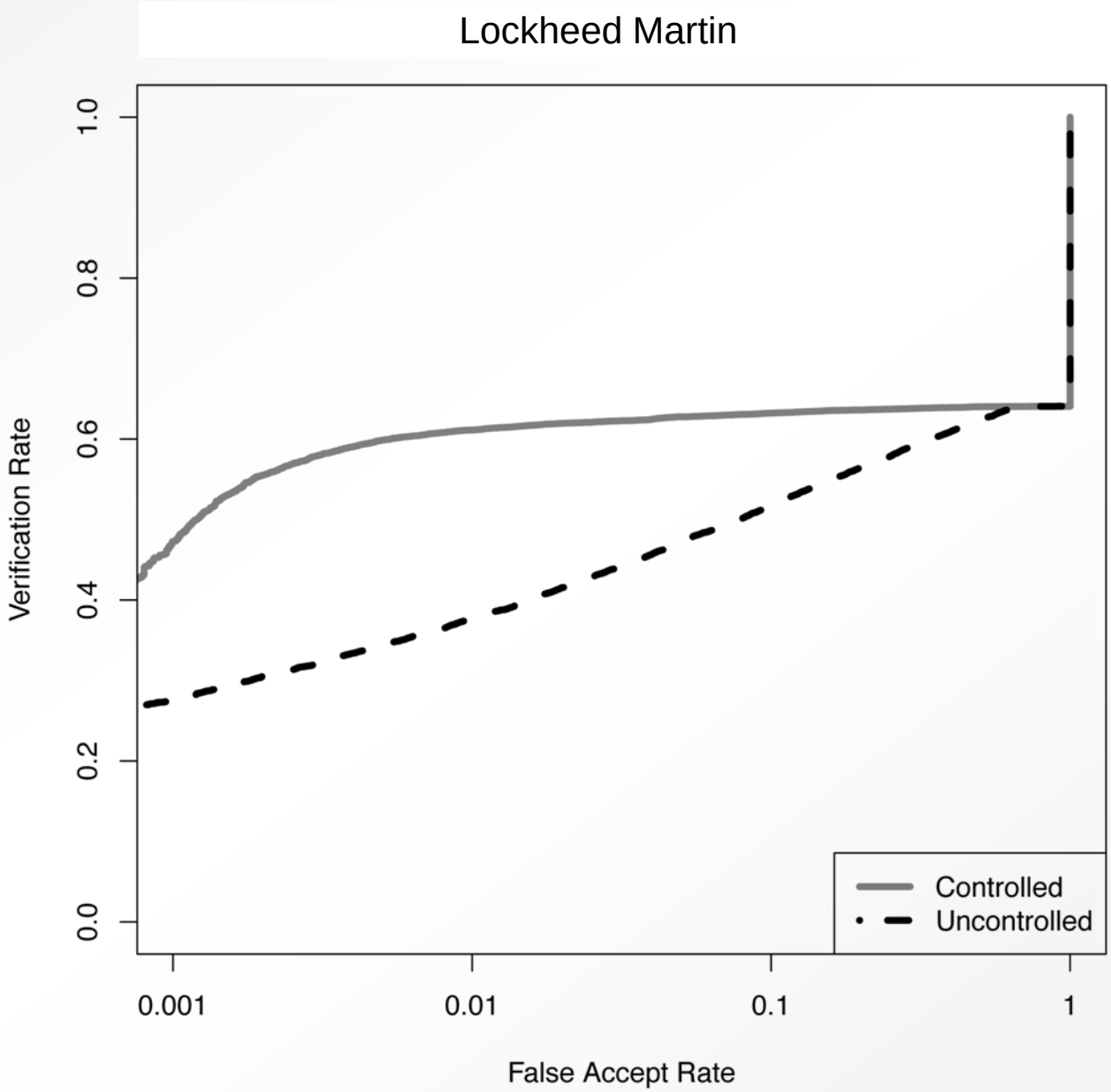
Near Infrared (NIR) Video Sequence

571 Sequences

Target

Query

Experiment – Still Face vs. NIR



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

Experiment:
Iris Stills vs. NIR Video

Iris Stills

4025 Images

Matching

Near Infrared (NIR) Video Sequence

571 Sequences

Target

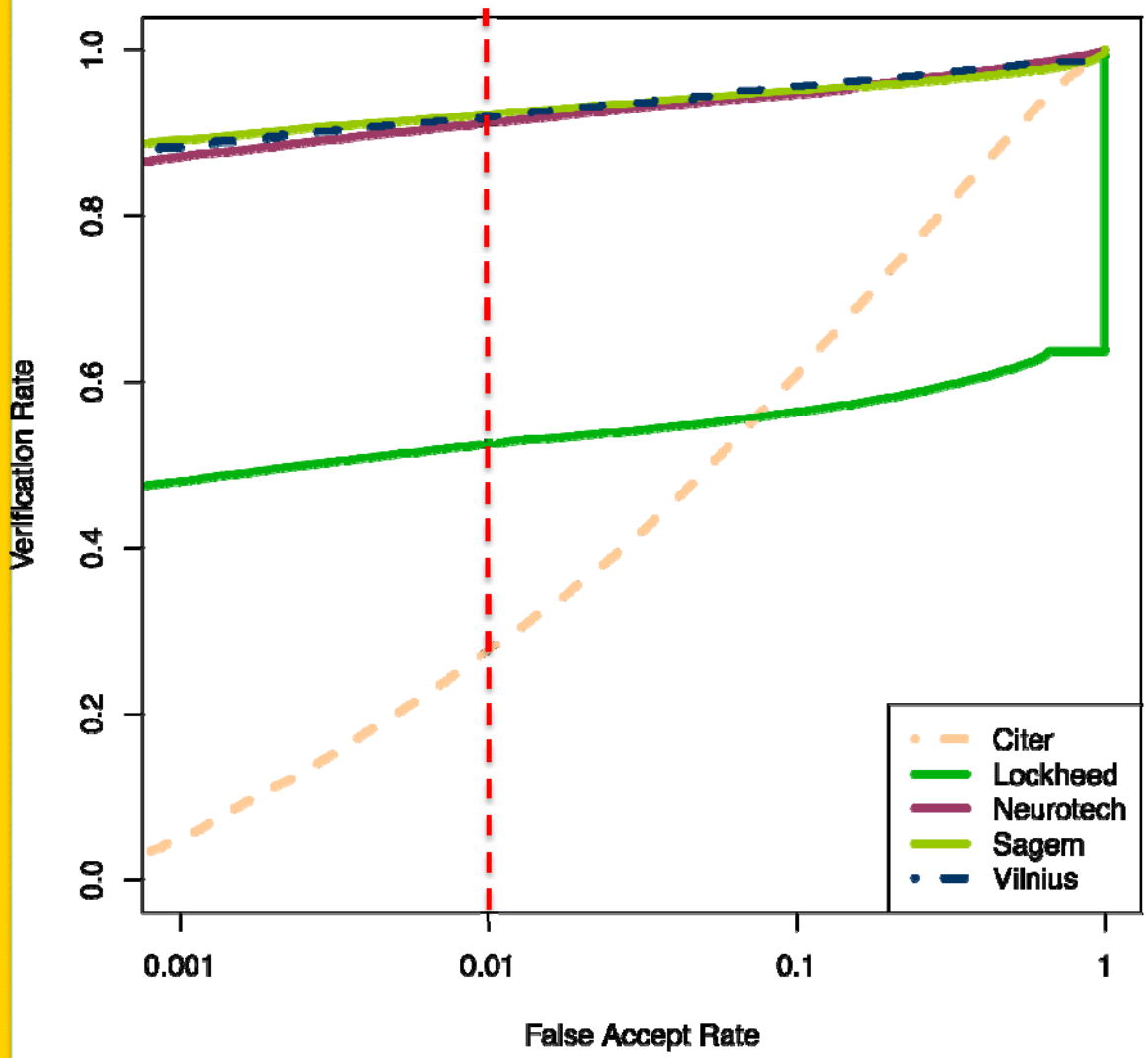
Query

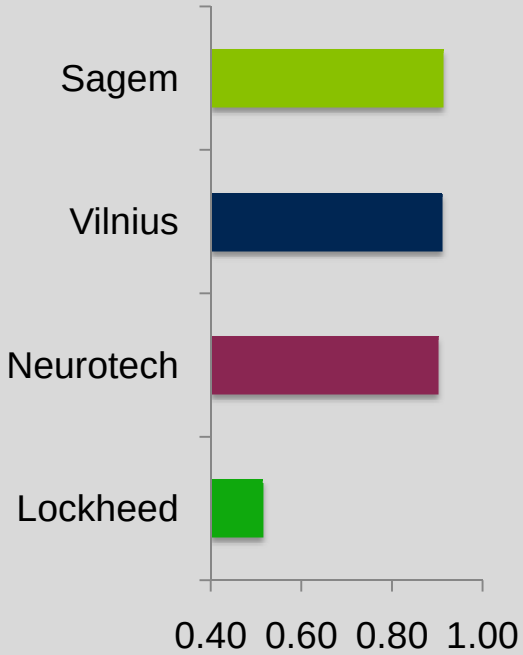
Missing Irises in NIR

Example of Missing Right Iris

- Missing Irises
  - Left eye: 3
  - Right eye: 25
- Initial Analysis
  - Left eye only
- One goal is measuring fusion performance
  - Right eye later
  - Appropriate scoring

Experiment – Iris Stills vs. NIR





Verification rates at FAR = 0.01

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

Experiment:
Controlled Face & Iris Still vs. HD & NIR Video

Iris Stills

Controlled Face Still

11,442 Images

Matching

Near Infrared (NIR) Video Sequence

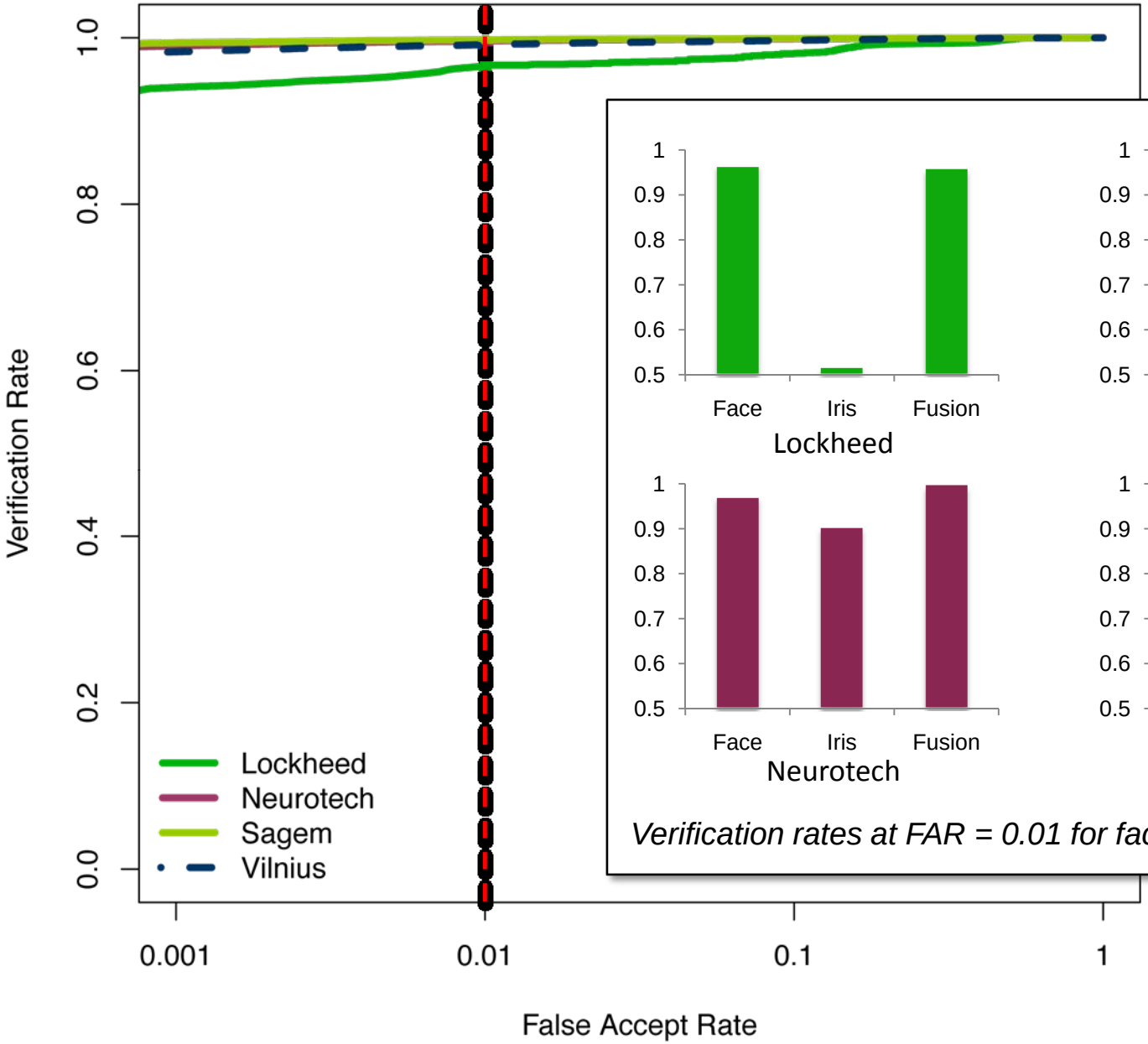
High Definition (HD) Video

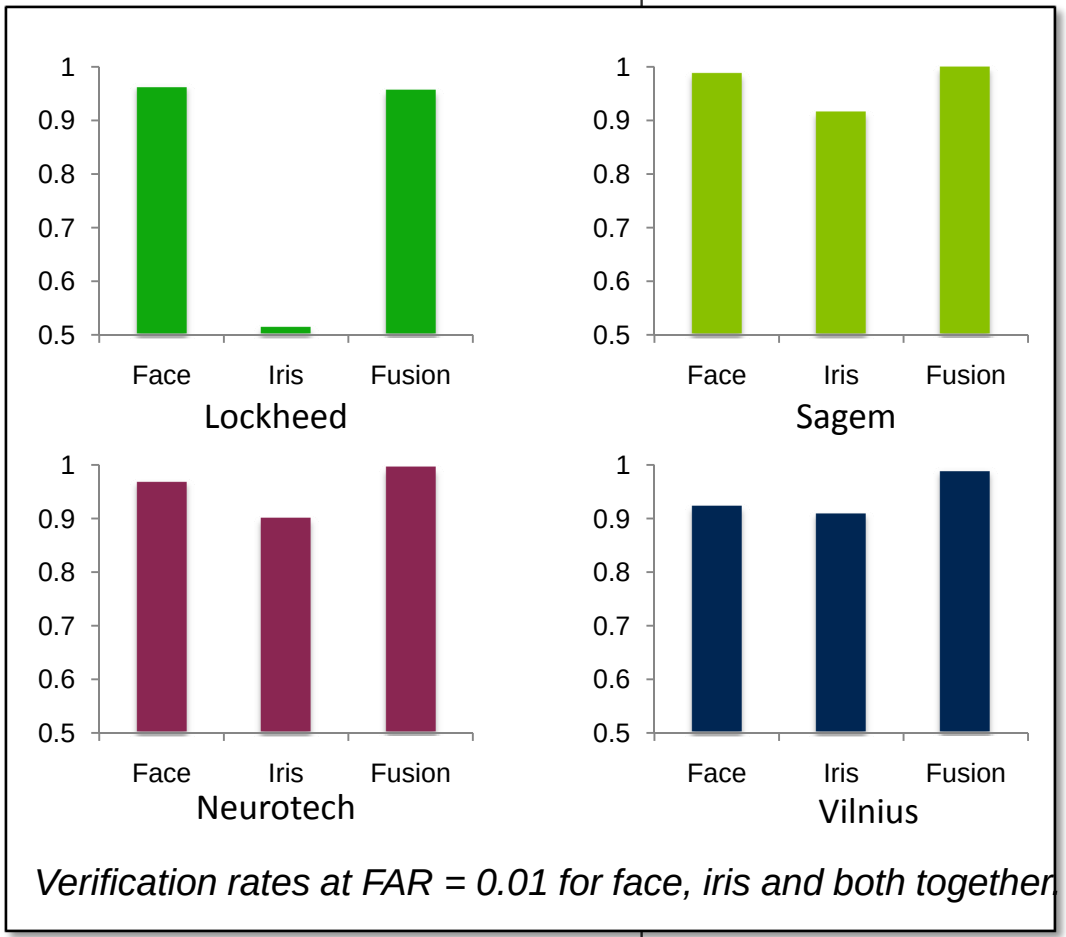
562 Sequences

Target

Query

Still Face Controlled – Left Iris Still vs HD – NIR Portal Video

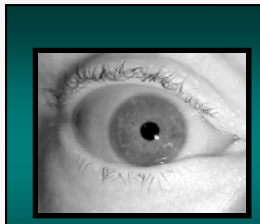




Verification rates at FAR = 0.01 for face, iris and both together

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

Experiment:
Uncontrolled Face & Iris Still vs. HD & NIR Video



Iris Stills

Uncontrolled Face Still

14,115 Images

Matching

Near Infrared (NIR) Video Sequence

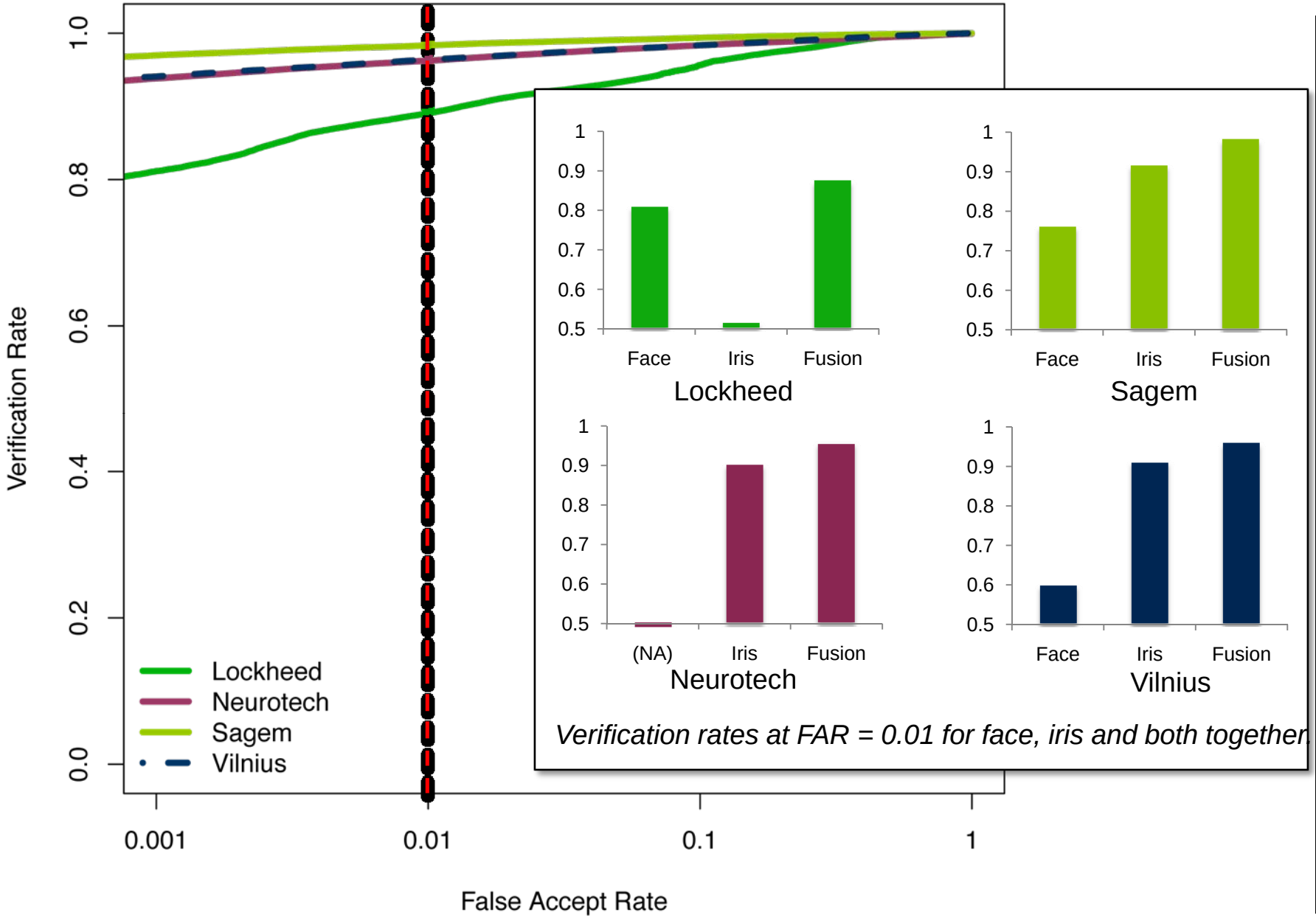
High Definition (HD) Video

562 Sequences

Target

Query

Still Face UnController – Left Iris Still vs HD – NIR Portal Video



Verification rates at FAR = 0.01 for face, iris and both together

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

Summary

- Controlled Face
  - .99+ VR @ FAR=0.01 for multiple vendors.
- Uncontrolled Face
  - .95+ VR @ FAR=0.01 for Pittsburgh Pattern Recognition.
- Iris
  - .90+ VR @ FAR=0.01 for multiple participants.
- Cross-mode face is challenging.
- Fusion helps.
  - Especially for uncontrolled face.
  - .99+ VR@FAR=0.01 for Controlled Face: Single Iris
  - .95+ VR@FAR=0.01 for Uncontrolled Face: Single Iris