



National Science & Technology Council

Interagency Working Group on Biometrics

Progress in Face Recognition Research & Biometric Infrastructure

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National Institute of Standards and Technology





Start →

BEE
Jan 2002 – Present

FRGC
May 2004 – Mar 2006

FRVT
2005
Oct 2005 – Dec 2006

Future Directions

ICE
Aug 2005 – Dec 2006



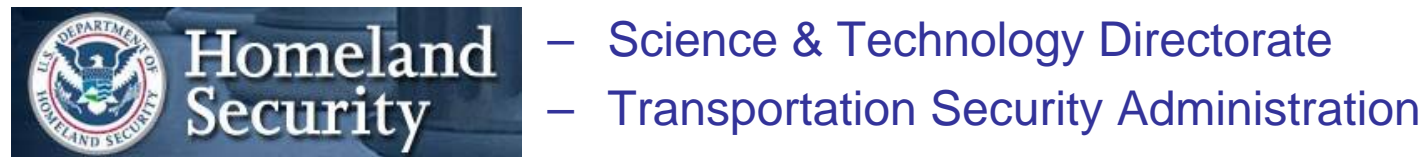
FRGC, FRVT 2005 & ICE Sponsors



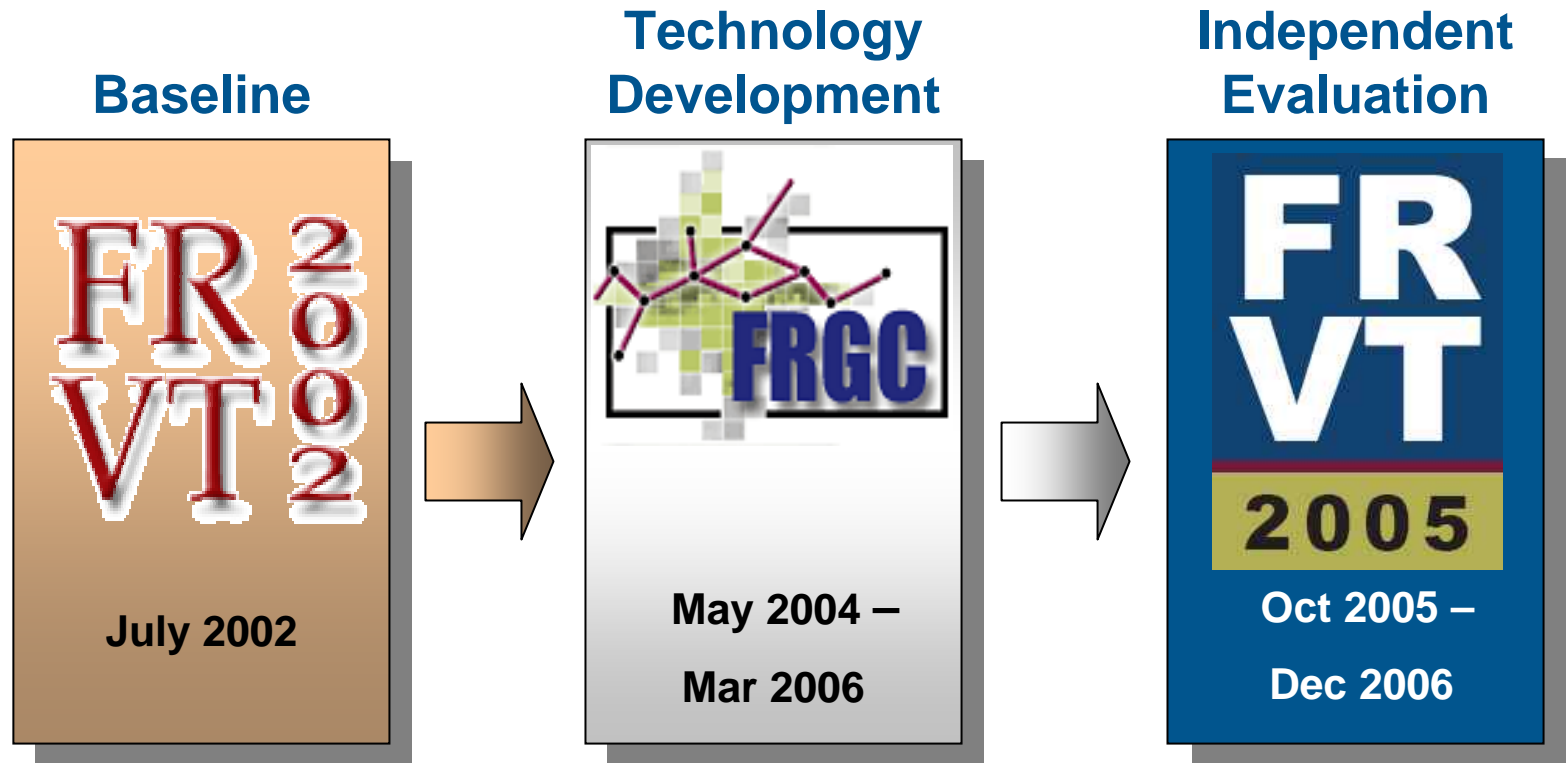
Executing Agency



Sponsoring Agencies



Background



FRGC Goal and Objective



- The primary goal of the FRGC is to:

Promote and advance face recognition technology to support U.S. Government face recognition efforts

FRGC Goal and Objective



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Promote and advance face recognition technology to support U.S. Government face recognition efforts

- **The primary objective of the FRGC is to:**

Develop still and 3D algorithms to improve performance an order of magnitude over FRVT 2002

Grand Challenge Architecture

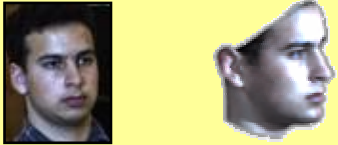


Accuracy of:

3D Sensors



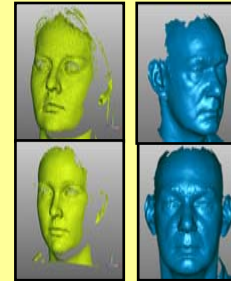
3D from stills



Comparison

Algorithms/
Systems

Modes



Human
Performance

Preprocessing/
Reconstruction
Compression

Image Quality
Measures

Meta data

- eye coordinates
- pose
- gender

Advanced
Statistical
Analysis

FRGC Modes Examined



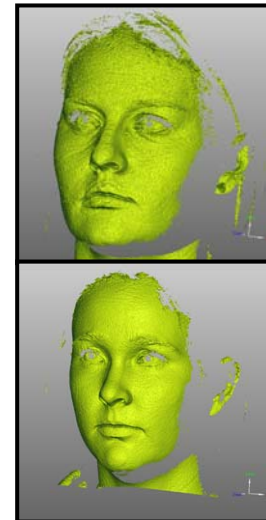
Single Still



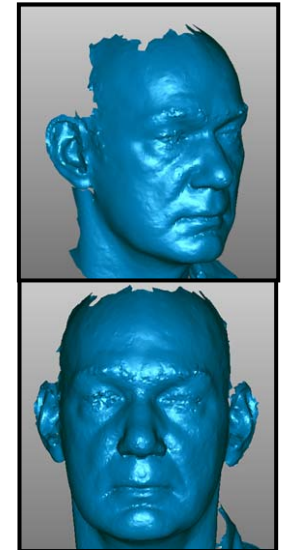
Outdoor/
Uncontrolled



Multiple Stills



3D Single
view



3D Full Face

FRGC Experiments

- Exp 1: Controlled indoor still versus indoor still

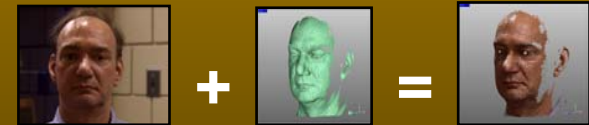


- Exp 2: Indoor multi-still versus indoor multi-still



- Exp 3: 3D versus 3D

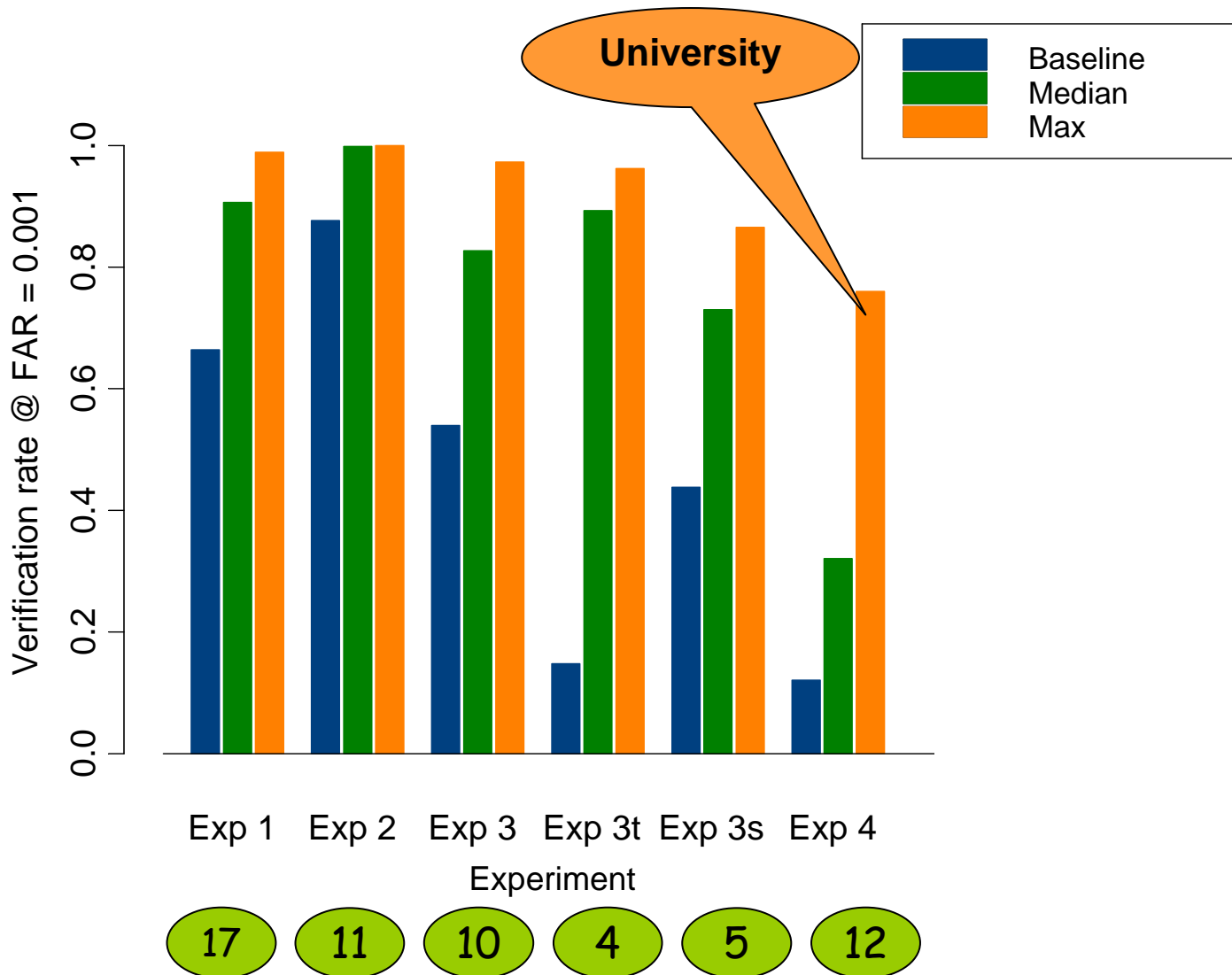
- 3t, texture channel only
- 3s, shape channel only



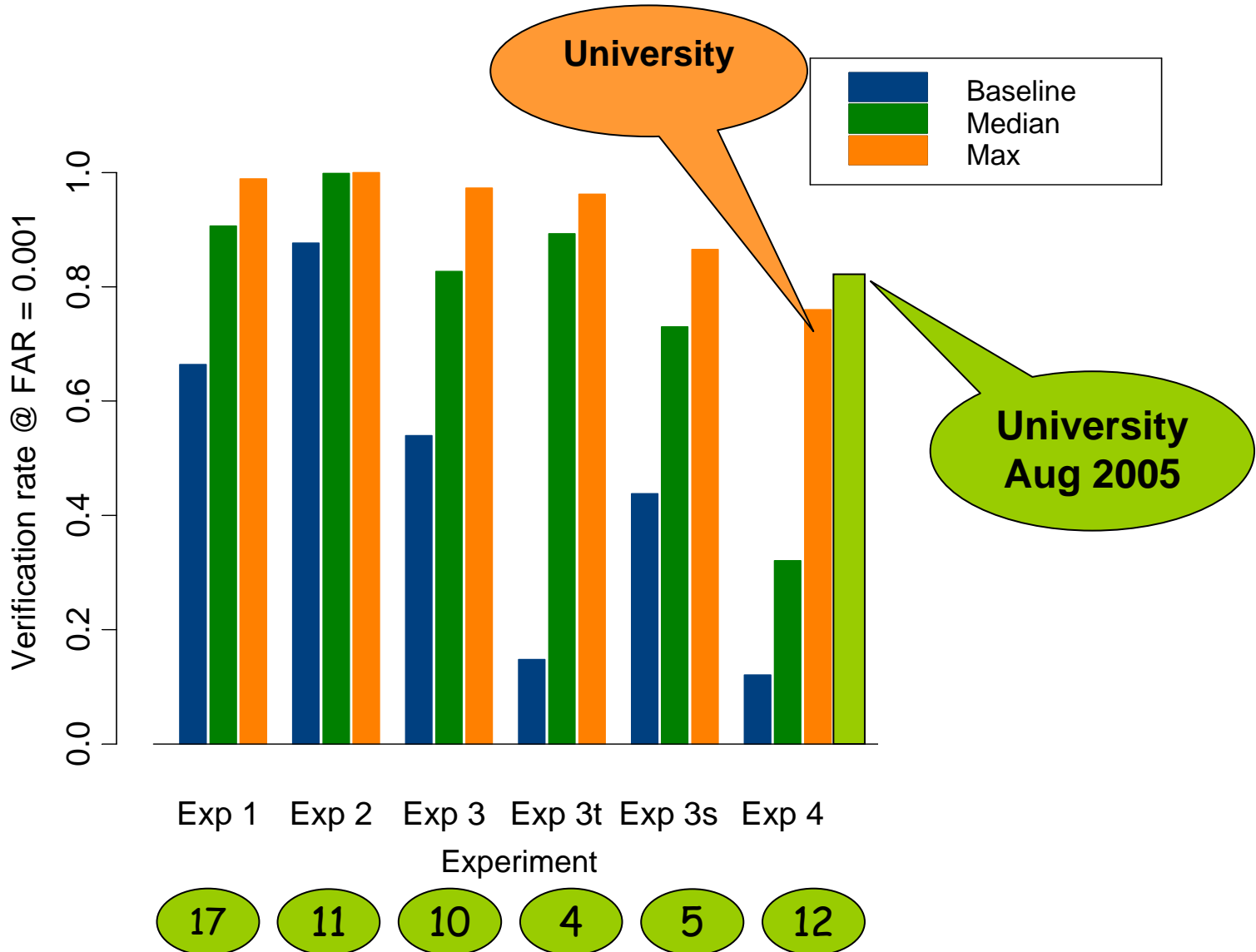
- Exp 4: Controlled indoor still versus uncontrolled still



Summary of FRGC Results – January 2005



FRGC Progress



Performance Goals and Progress

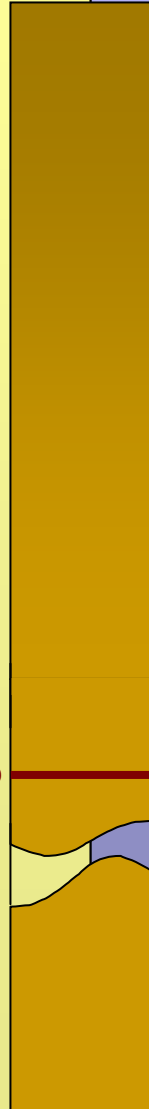
Independent Evaluations
(Gold Standard)

FRVT
2002

Starting Point 80%

Measured in
FRVT 2002

FAR = 0.1%



Performance Goals and Progress

Independent Evaluations (Gold Standard)



Goal

98%

To be measured
by FRVT 2005

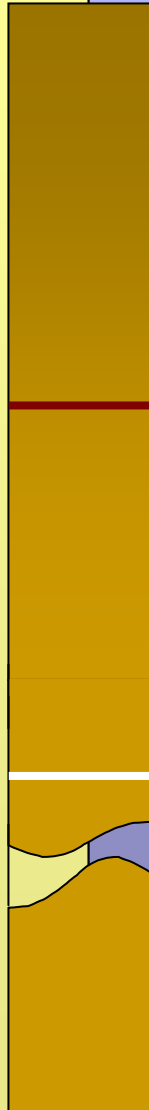
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Performance Goals and Progress

Independent Evaluations (Gold Standard)



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Face Recognition Grand Challenge (Qualified Results)

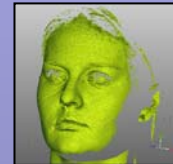
**99.99% Multi-Still
(Jan 05)**



**99% High Resolution Still
(Jan 05)**



**97% Three-Dimensional
(Jan 05)**



* First set of results after 4 months in a 12 month period

Performance Goals and Progress

Independent Evaluations (Gold Standard)



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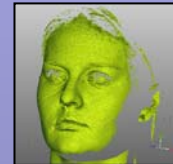
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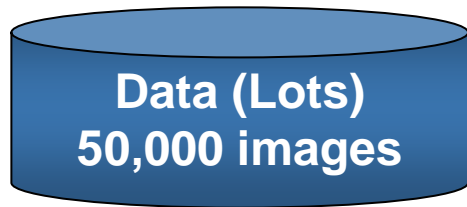
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Future Directions

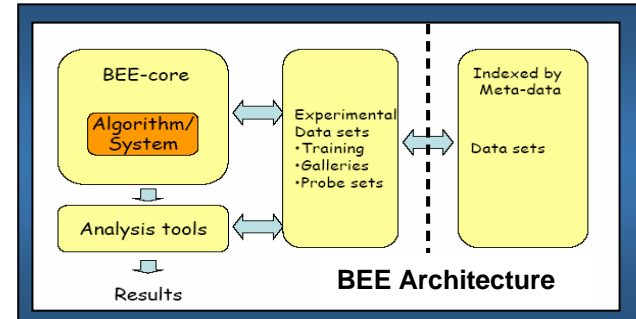
- **Face Recognition Advanced Study Workshop**
 - **11-14 November 2005**
 - **West Virginia University, Morgantown, WV**
 - **Objective**
 - Intense technical discussions to identify next steps in face recognition
 - **Outcome**
 - Identification of technology gaps
 - Roadmap to bridge the gaps



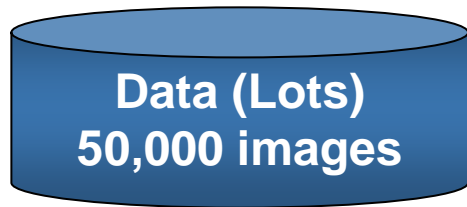
Infrastructure



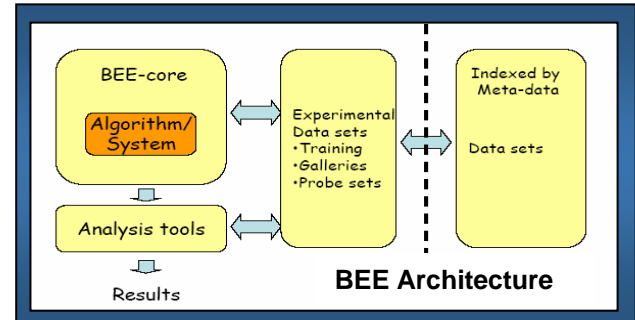
Biometric Experimentation Environment (BEE)



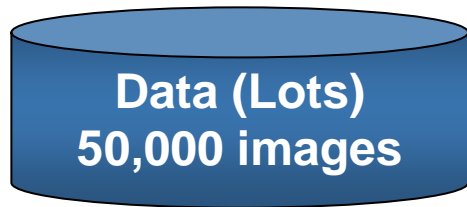
Infrastructure



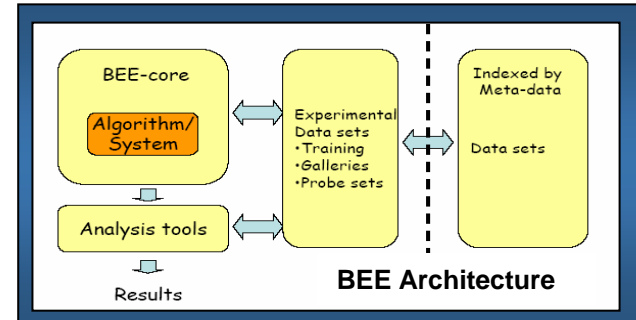
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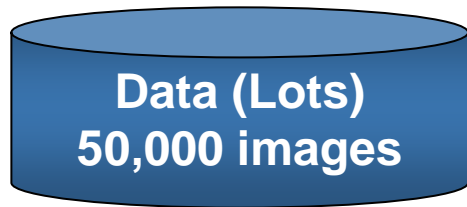
Infrastructure



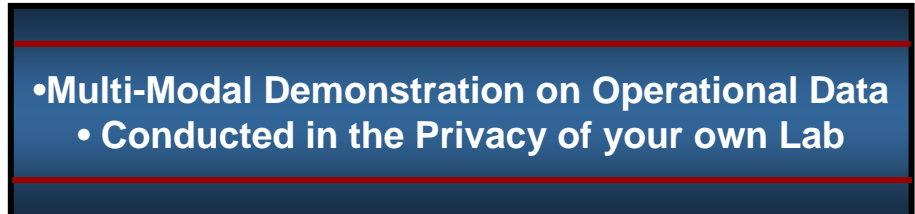
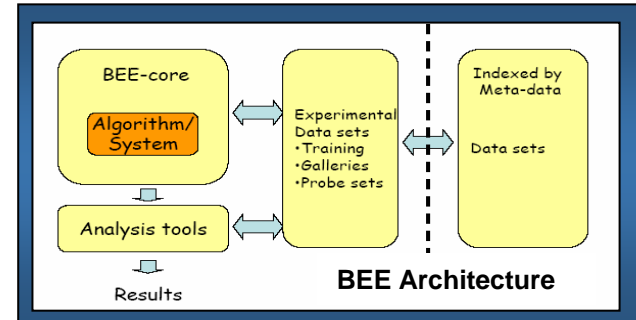
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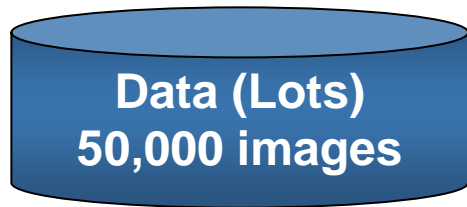
Infrastructure



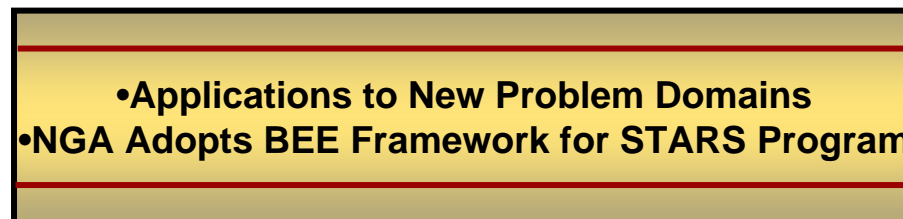
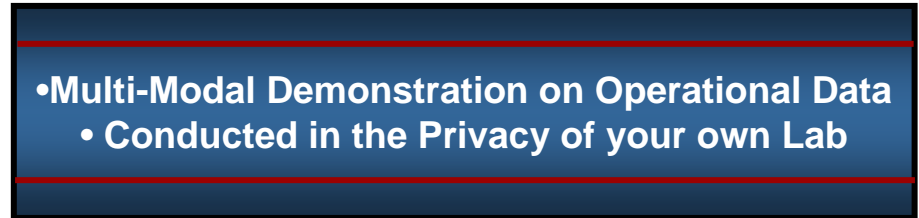
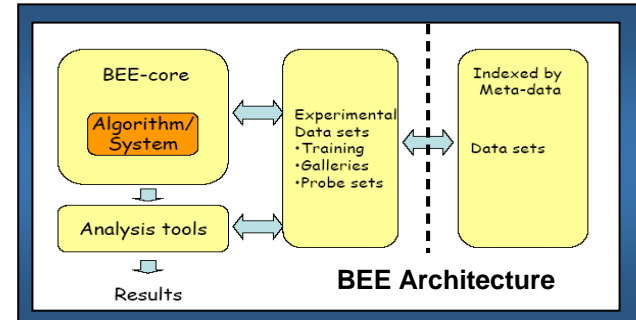
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Infrastructure



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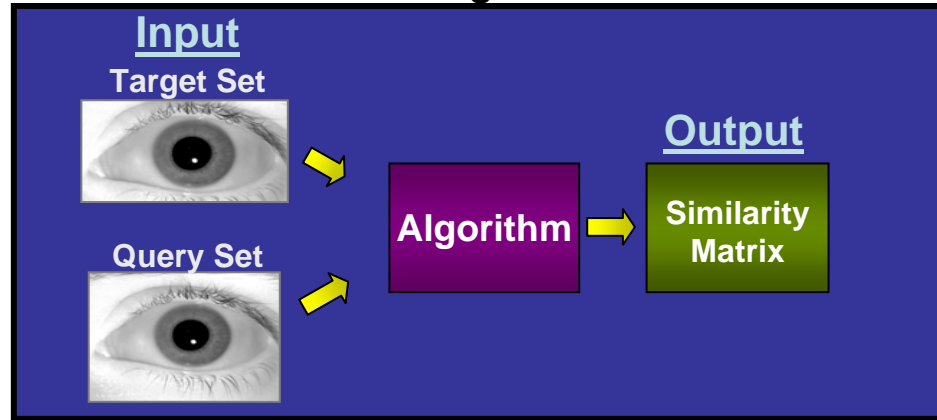




- Broad Goals
 - Technology assessment of iris recognition
 - Facilitate technology development
- Modeled after FRGC/FRVT 2005
- Q: What portion of the iris recognition problem does ICE address?
 - A: Recognition algorithms. ICE will provide a set of iris images

Questions Examined

Recognition



Segmentation / Location

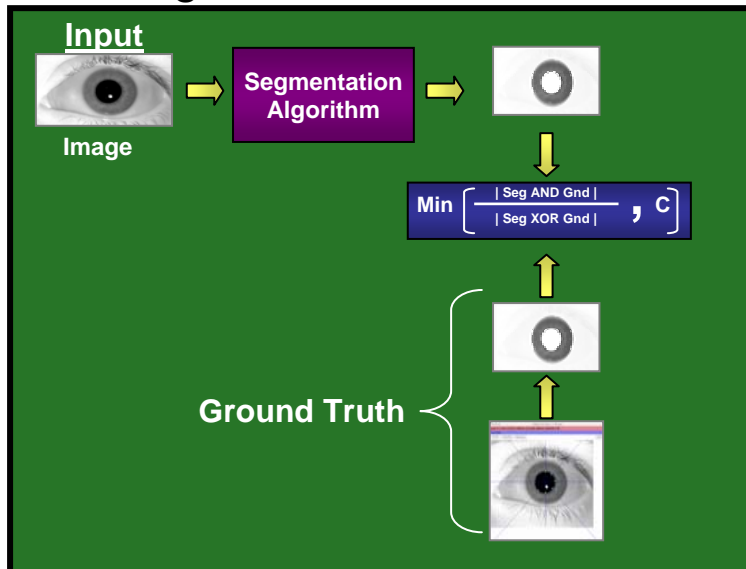
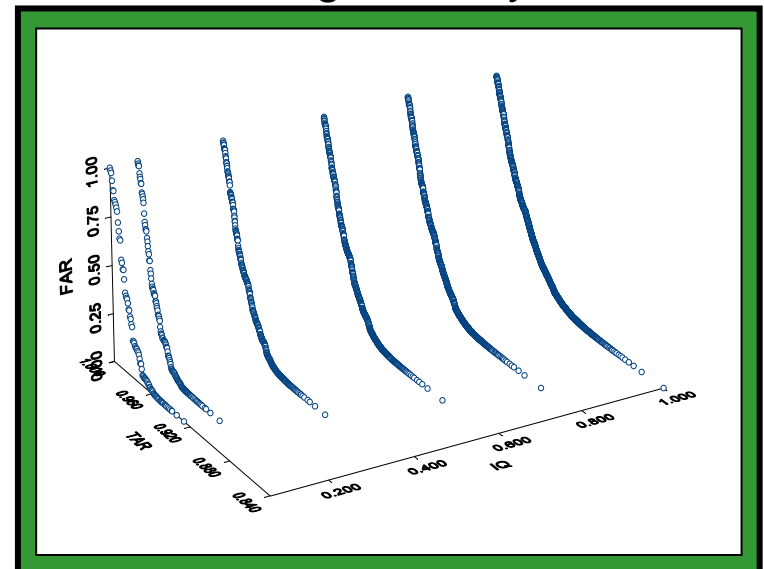


Image Quality



Conclusion

- Face Recognition Grand Challenge (FRGC)
- Face Recognition Vendor Test (FRVT) 2005
- Iris Challenge Evaluation (ICE)
- Biometrics Experimentation Environment (BEE)

- Face Recognition Advanced Study Workshop

