Facial Identification

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Solutions

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IDEAL BIOMETRICS

- Twofold accuracy
  - Never accept unauthorised persons (FAR)
  - Never reject authorised persons (FRR)
- MUST be
  - Unobtrusive
  - Intuitive (easy to use)
  - Readily accepted; Cost Effective

Objective : Security + Functionality ! *(& cost)*

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Facial Recognition

What is facial recognition?

- **Face recognition is a non-intrusive, biometric method of matching a given face to a database of faces.**
- **Can be used to secretly identify one or many persons against an image database**
- **Can be used to identify a possible shop lifter / thief / suspect against an image database**

Face Recognition

I-CUBE

Solutions

WHY FACIAL?

Casino Exclusion Technique Exploration

- Framework Development

80 %

B. T. DUDLEY MSc (Image Analysis, UNP. Cum Laude)

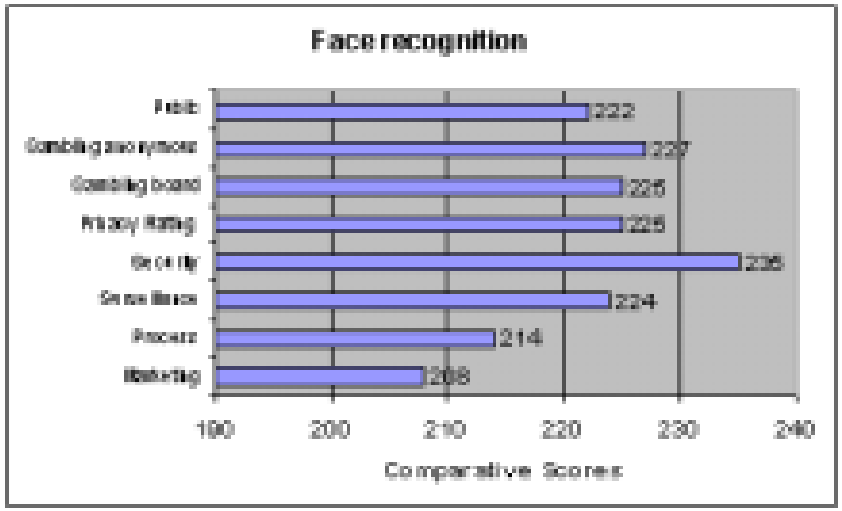
882207268

Submitted in partial fulfilment of the academic requirements for the d

MASTERS IN BUSINESS ADMINISTRATION

Graduate School of Business, Faculty of Management

University of Natal (Durban)



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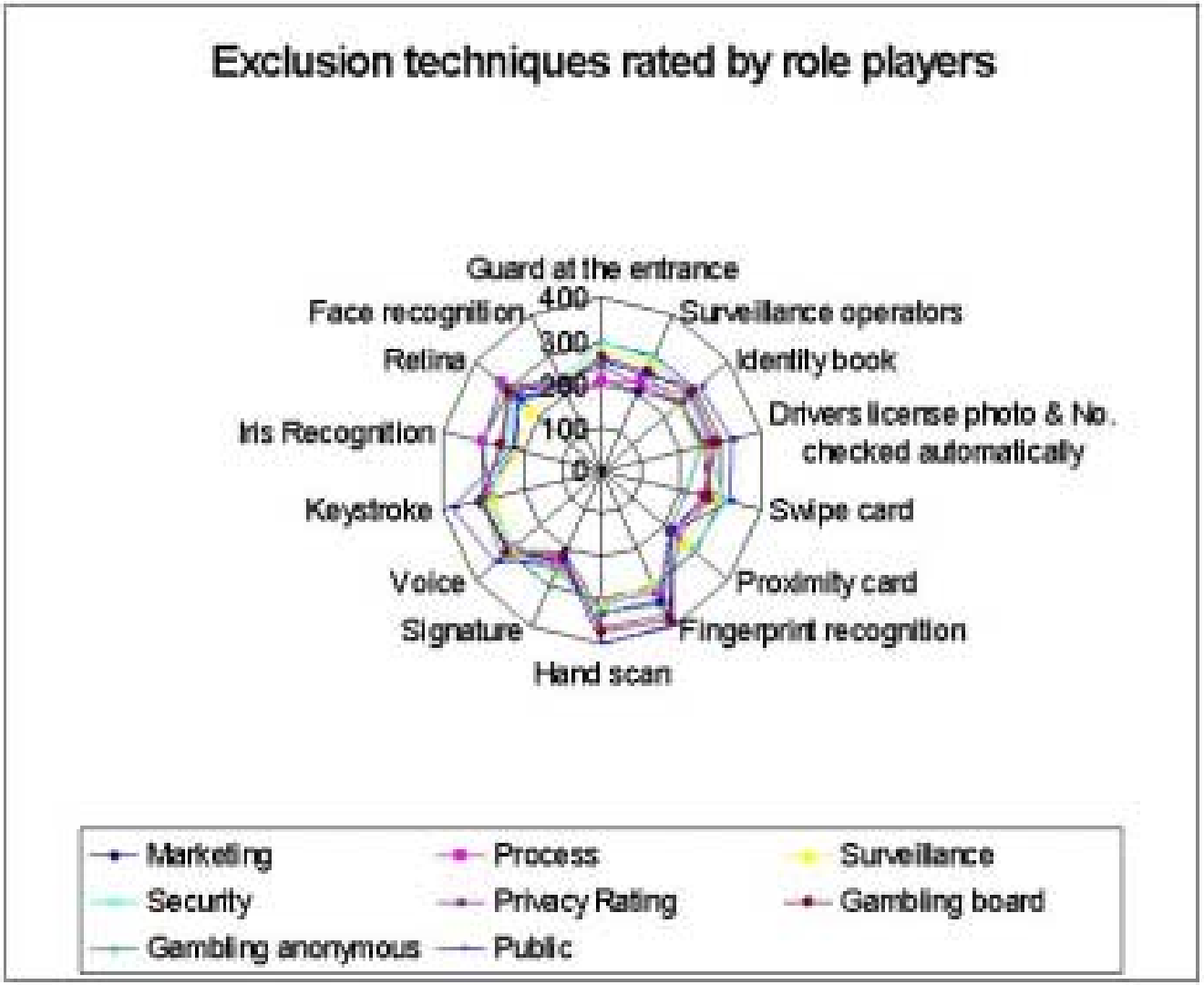
Obtain MBA dissertation for more details:



TO OBTAIN A COPY:
Send an e-mail to:
MBA@I-Cube.co.za
A 2 MB file will be sent to your e-mail address

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Facial Recognition System

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Unique differentiation

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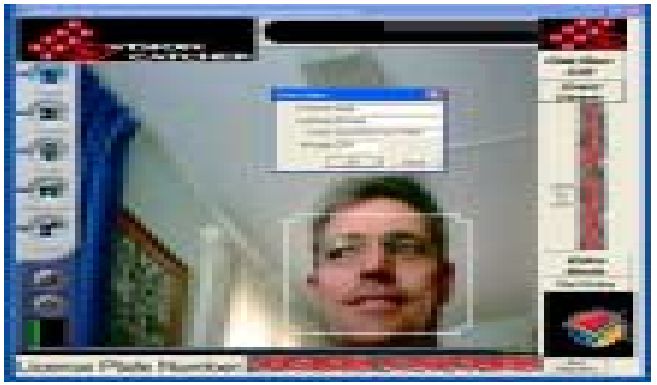
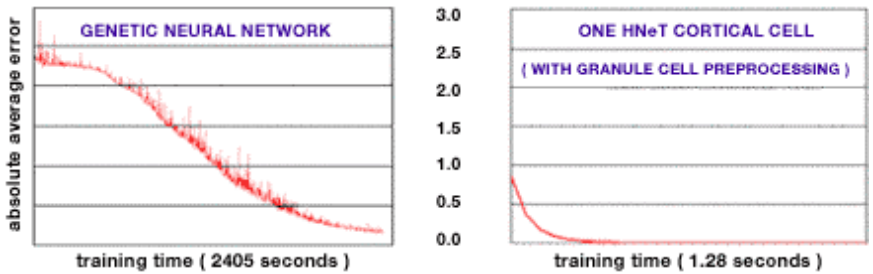
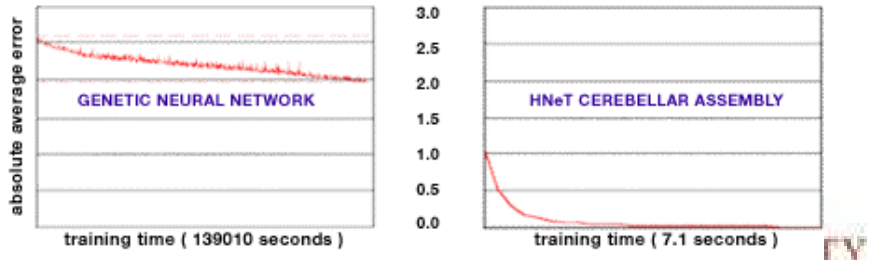


- 3D & HNet (Holographic quantum neural technology) automatic continuous learning
- Adjusting for difference due to aging and cosmetics without increasing the size of the biometric template

The Monte Carlo Test



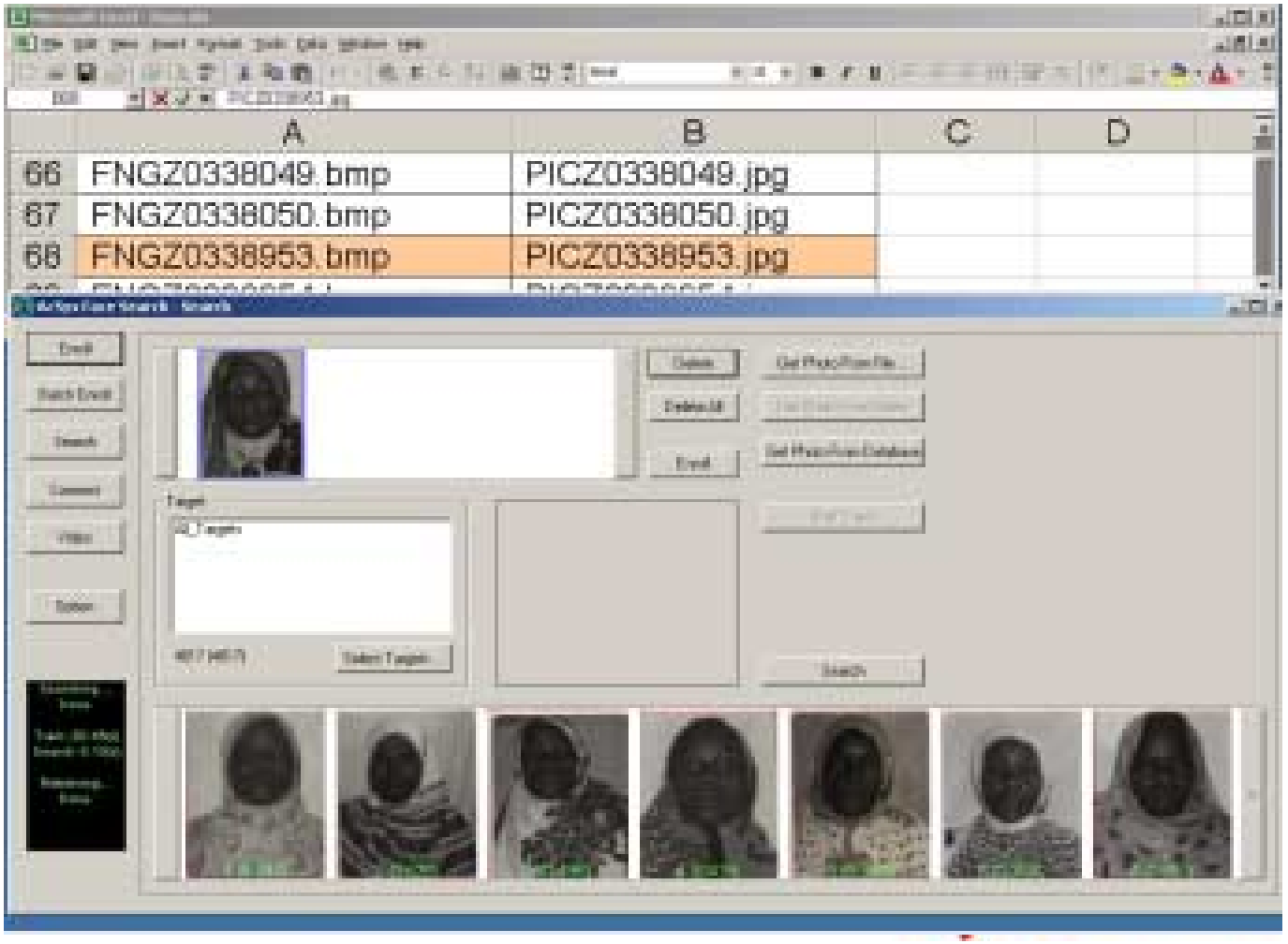


I-CUBE Solutions

Facial Recognition

3D System – Speed

Using a revolutionary core technology HNet, based on neural networks, I-CUBE facial recognition delivers cutting-edge security and split-second processing times.



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Facial Recognition

Tracking

In order to make face recognition non-intrusive and flexible, the Discovery system automatically locates and follows any human face that is within the camera's field of view.

This allows the individual to act in a natural manner with freedom of movement and locomotion, and minimal cooperation with the system.

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Camera (CCTV / Web Cam / IP / etc. CAMERAS

Facial SYSTEM

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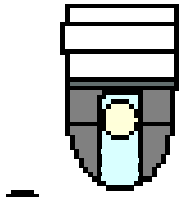
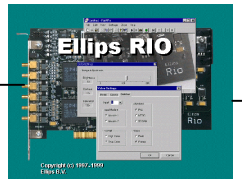
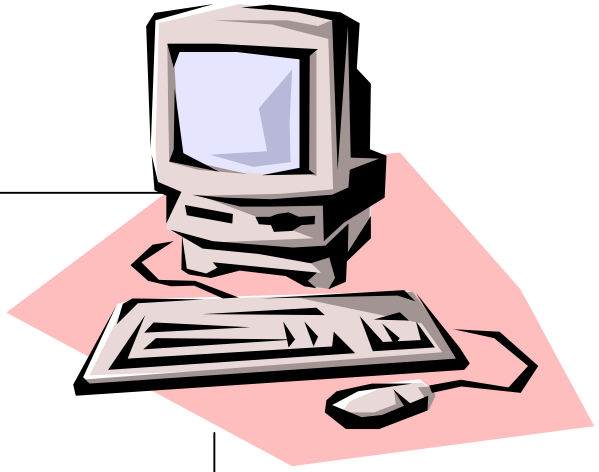




Frame Grabber



PC Station

FACIAL Software

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Facial Recognition

Equipment required:

ITEM	DETAIL	No. Provided
Face Recognition SERVER	Ability to add facial images and personal details, create multiple Databases, view closest matches	1
Face Recognition CLIENTS	Ability to capture from a VIDEO FOR WINDOWS source and	1 - many
Frame Grabber	Video capture device linked to cameras	1 - many
PC	• Microsoft® Windows® 2000 Professional (SP 4) • 3 GHz Pentium 4 Processor • 1 GB RAM • 1 TB HDD	1 - many
Monitor	19” flat screen	1 - many
Key & M	Wireless Keyboard & Mouse	1 - many
Cables	BNC to RCA cable	1 - many
UPS	15 Min standby	1 - many

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Face Recognition Front End

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Facial ID

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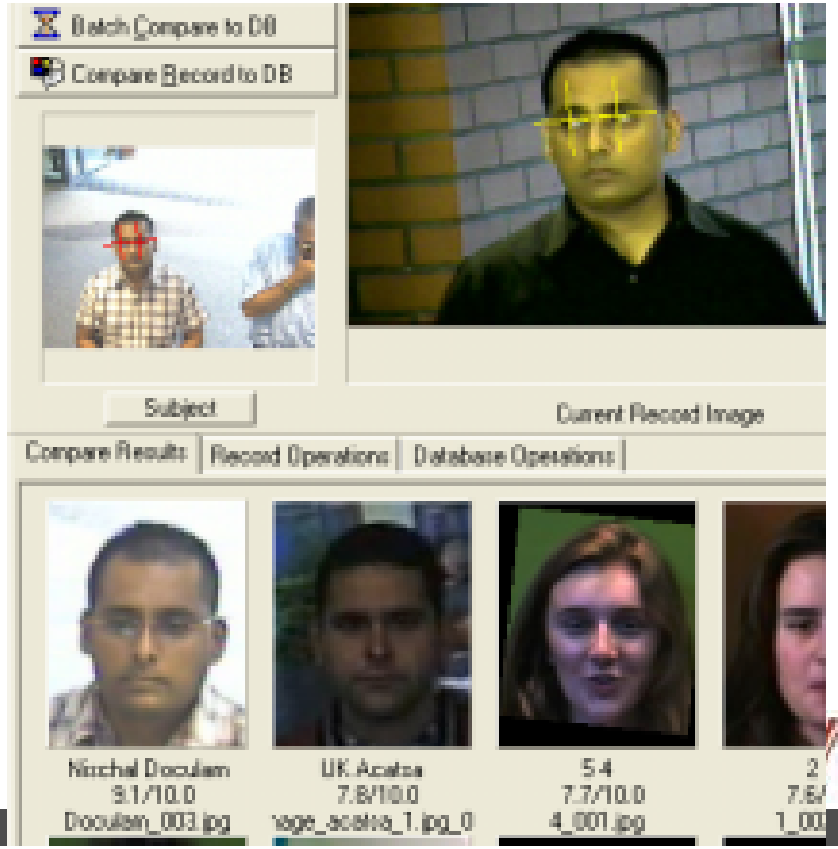

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Facial ID

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Facial Recognition

Enrollment

Enrollment is the capturing and storing of facial images of the user, in order to generate the facial biometric template. The greater the volume and quality of the enrollment images, the faster and more reliably the system will recognize the user during subsequent verify or classify operations.

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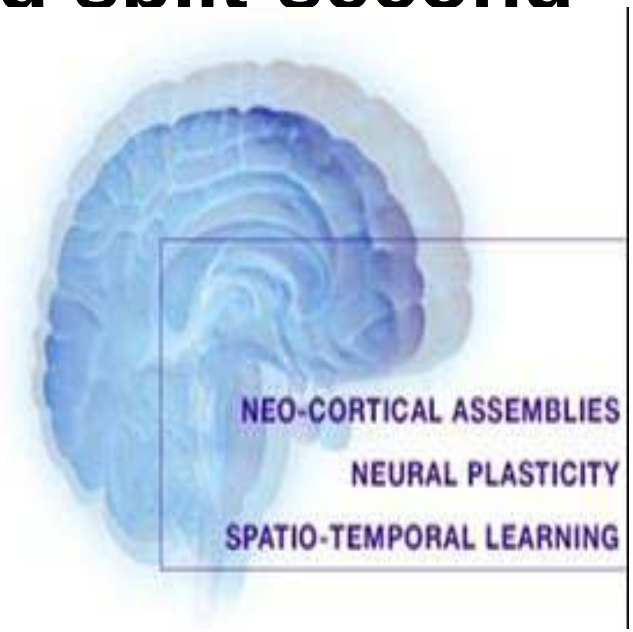
Facial Recognition

3D System – Speed

Using a revolutionary core technology HNet, based on neural networks, I-CUBE facial recognition delivers cutting-edge security and split-second processing times



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Identification of an unknown

Compare person against existing relevant databases, RESULT list of closest matches.

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Identification of a unknown, anyone seen by the cameras

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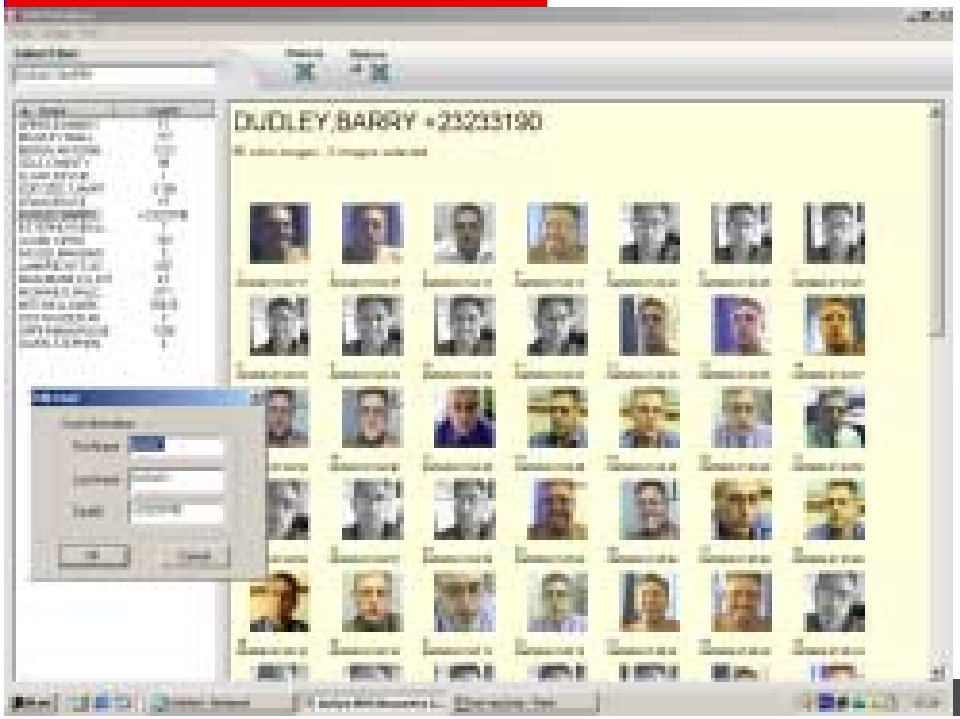
Facial Recognition

Training



Biometric templates are continuously updated through a process referred to as "Training" using facial images captured during enrollment operations or during subsequent verify operations. This ensures that the biometric templates are as up-to-date as possible.

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Facial Recognition

3D System – Intelligence

The proposed FRS learns, remembers and recognises, becoming more familiar with your face each time it sees you, adjusting for difference due to aging and cosmetics.

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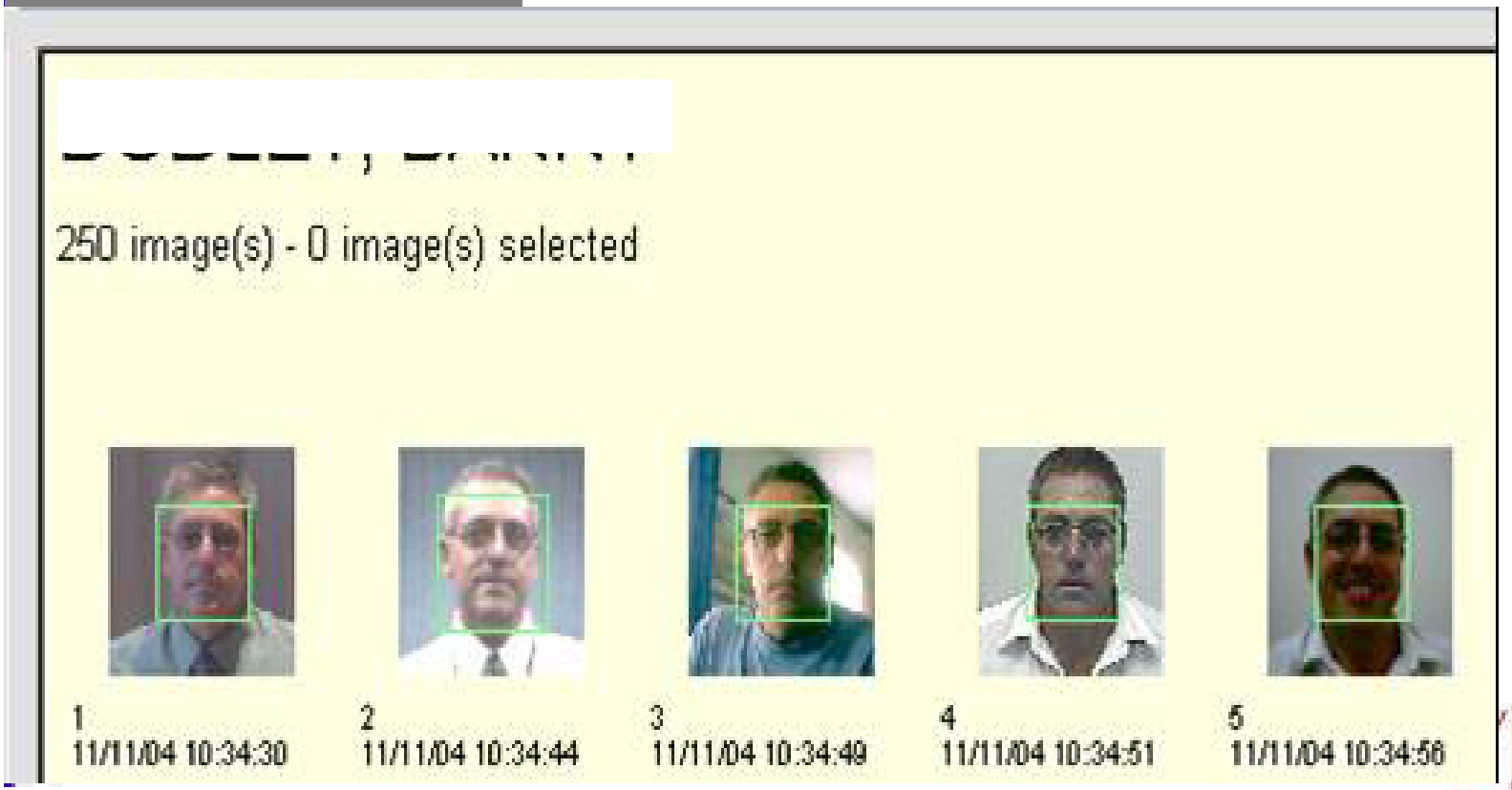

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Facial Recognition

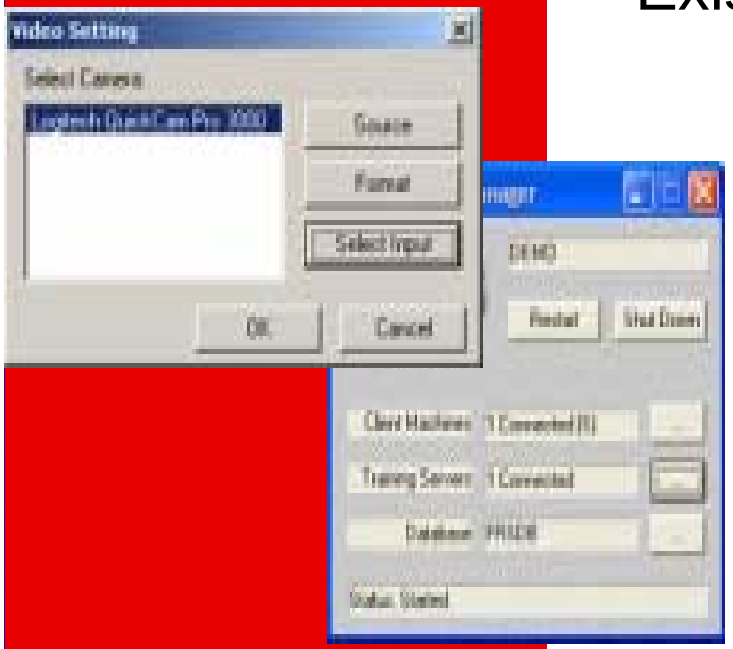
Classification

- If a users identity is not known, the classification operation may be used to identify the individual from the group of facial templates loaded within the system. Classification works by attempting to match the unknown user against all users currently enrolled in the Discovery database. This process is also referred to as one-to-many identification.

Facial Recognition

System – Solution components

- Advanced FACIAL VERIFICATION Software (Server and a no. of clients)
- S-912 Video Grabber hardware to connect the camera via RCA to the Windows based PC's
- Existing (or new) cameras



Facial Recognition

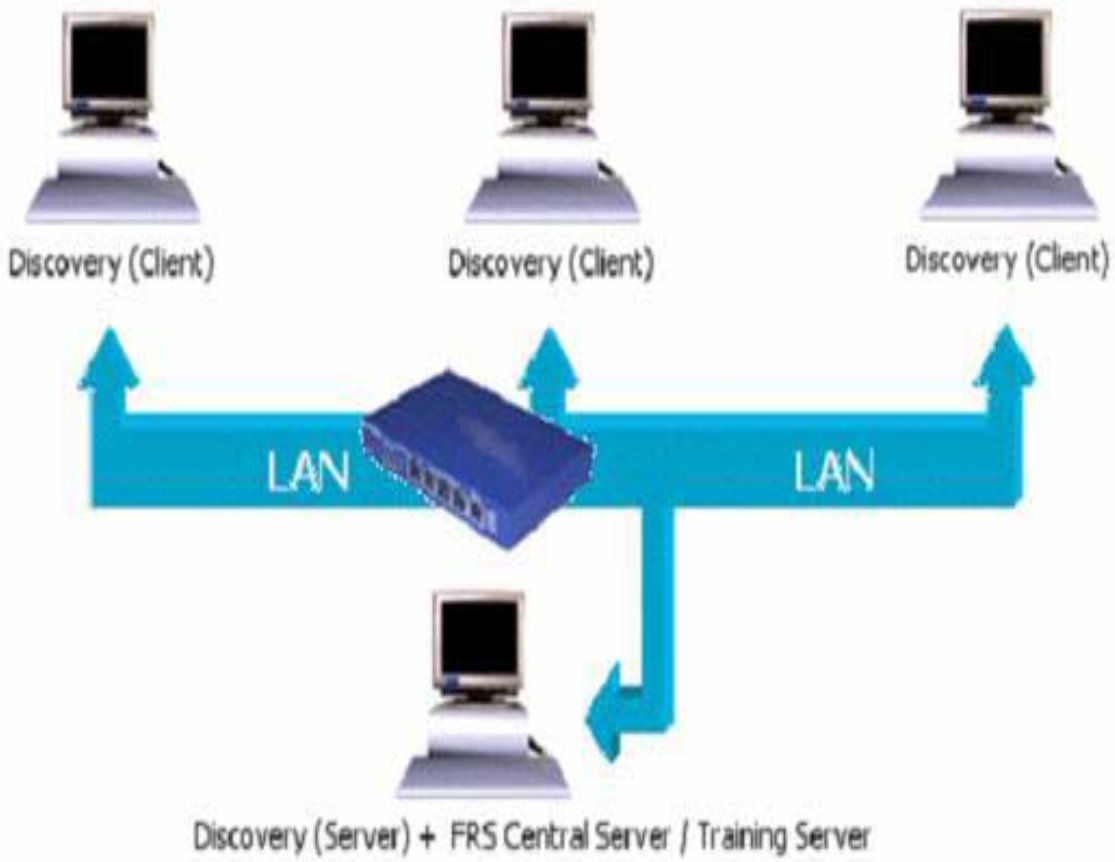
3D System

While operating in Track mode, the Discovery application will locate any human face within the video frame, place a Tracking Box around the face and follow the face within the frame. The Discovery application is able to track up to 4 faces simultaneously.

Facial Recognition

3D System – How does this get connected?

FRS Network (multiple clients, one server): -



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Facial Recognition

3D System – What are the benefits?

Speed, accuracy and intelligence are among the key qualities

Facts, features and benefits

of facial recognition

New real-time security alternatives are a reality today, says Lodge, with its lightning fast face recognition system. A leading developer of mission critical retail solutions, Lodge says it is committed to leadership, responsiveness and unparalleled results. "We are driven to empower our clients and partners to go beyond tradition to create new benchmarks for security. Accuracy is everything."

48 Security Focus April 2004

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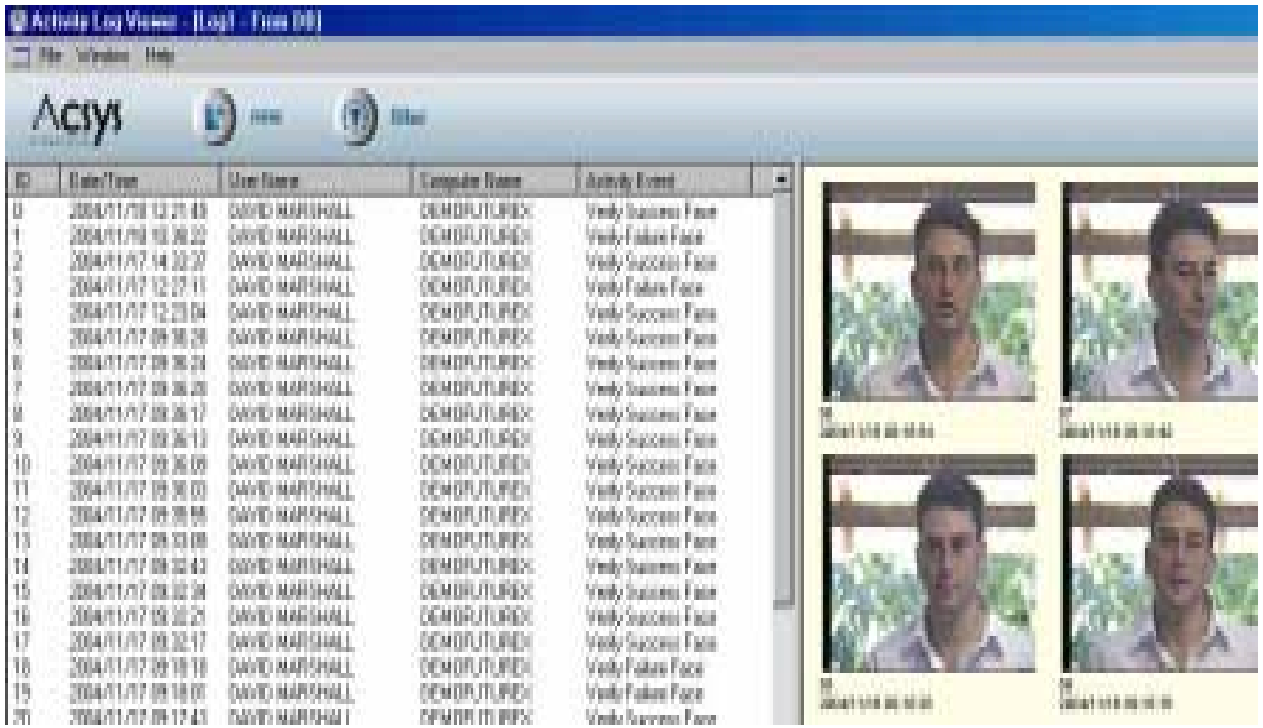
Facial Recognition

3D System – Accuracy

The proposed FRS was the most accurate technology tested in the International Biometric Group's Comparative Testing for IT Security and E-Commerce



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Facial Recognition

3D System – Intelligence

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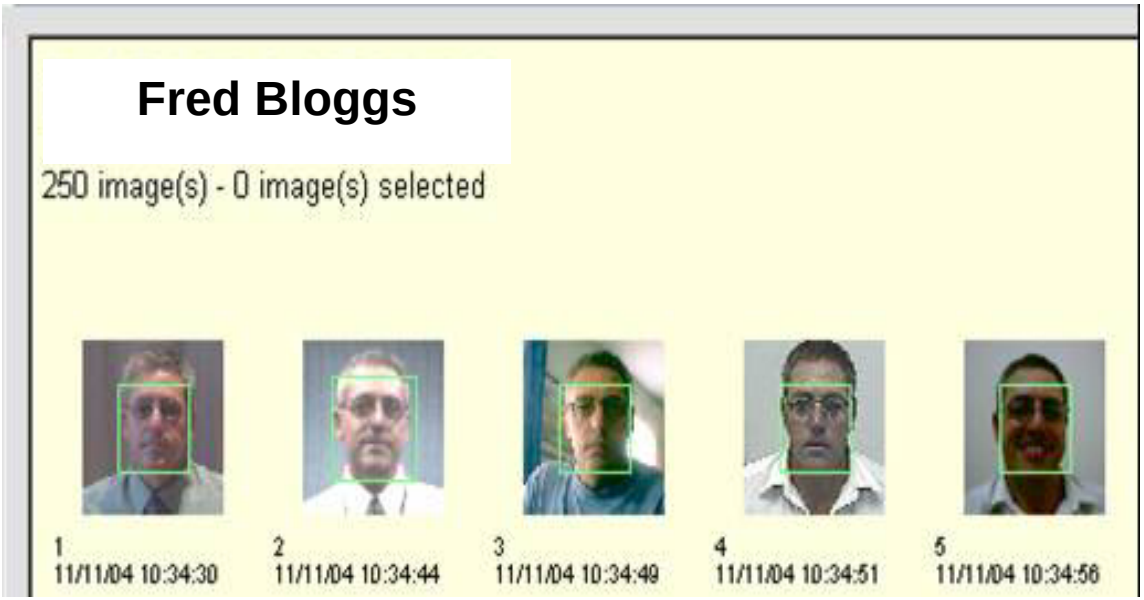

POSSIBLE Requirements:

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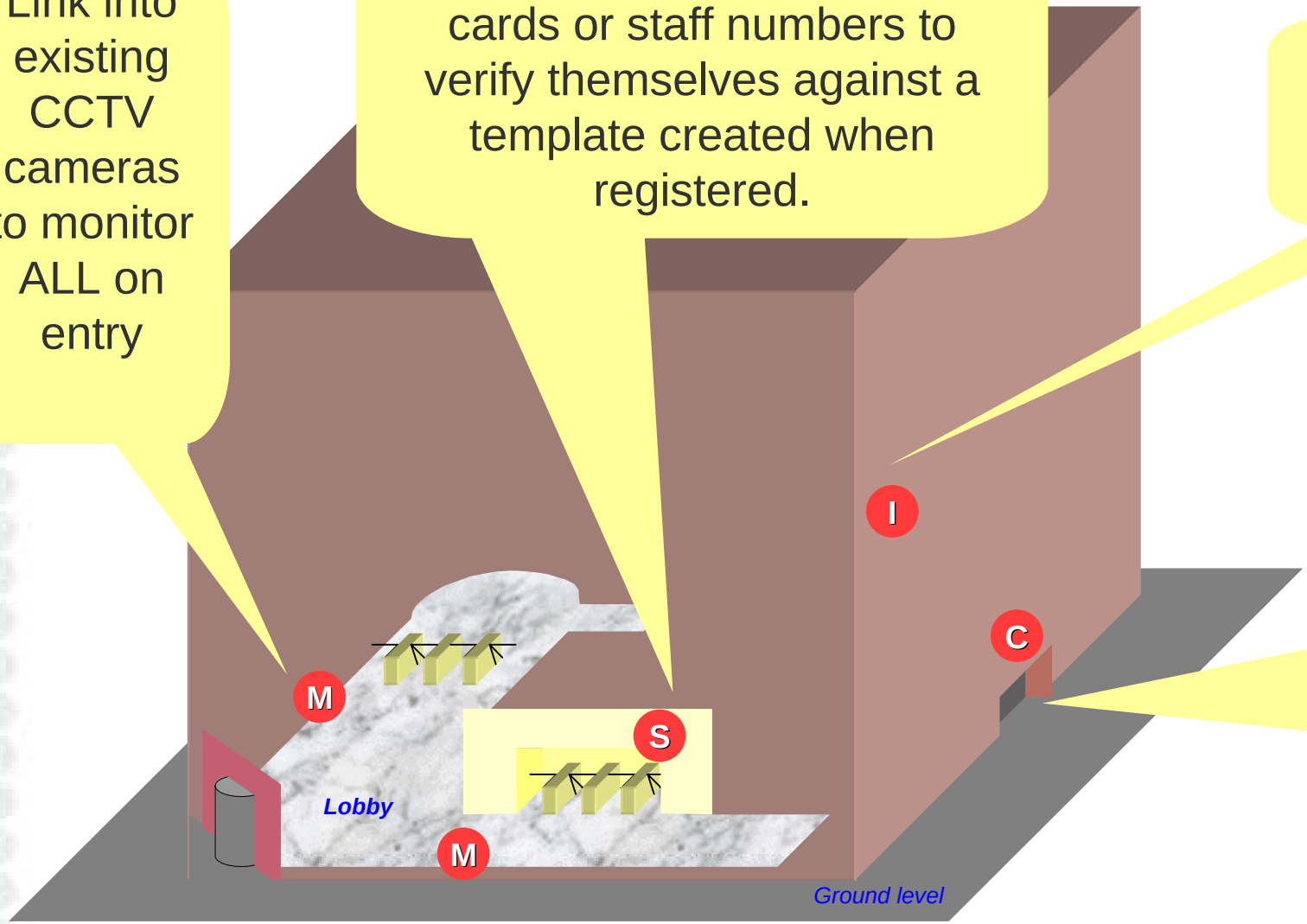
Link into existing CCTV cameras to monitor ALL on entry

STAFF can use their existing cards or staff numbers to verify themselves against a template created when registered.

FACIAL ID to IDENTIFY suspects

Facial capture of all people who come and go



M ain entrance / lobby S taff entrance I denfity C apture

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- The Facial system is based upon a two-tier client/server architecture. The system consists of a single Discovery Server application either running as a standalone application, or connected to one or more Discovery Client applications. All FRS data pertaining to images and biometric templates are stored centrally on the Discovery Server and facial recognition operations may be performed on either Server or Client machines.

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new filter


:55:12


121
2006/12/09 07:55:24

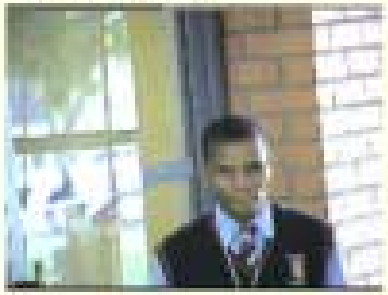

122
2006/12/09 07:55:28


123
2006/12/09 07:55:41


99
2006/12/09 07:46:57


:46:09


101
2006/12/09 07:46:14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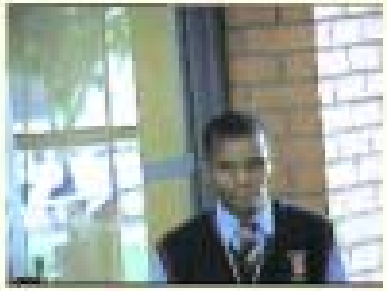
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104
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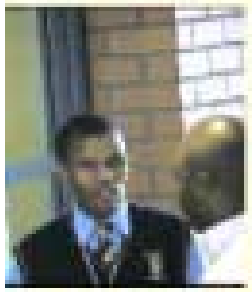
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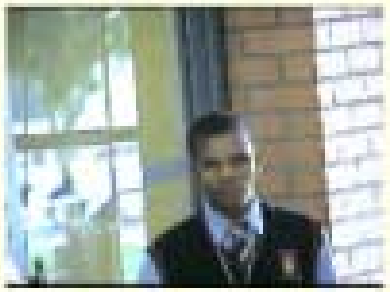
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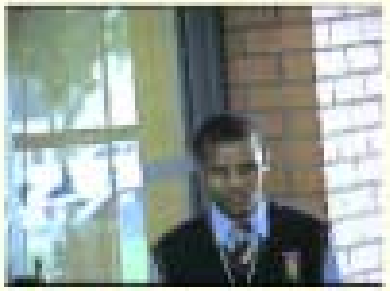
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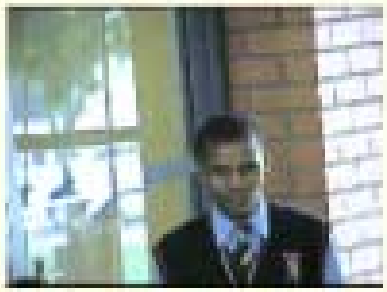
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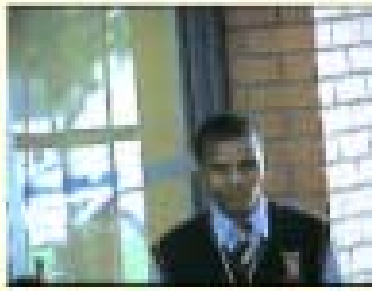
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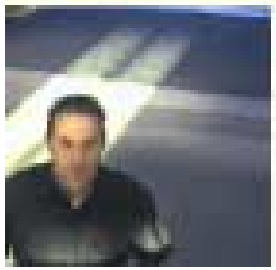

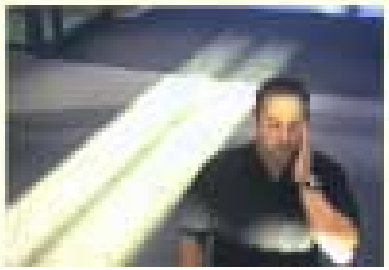

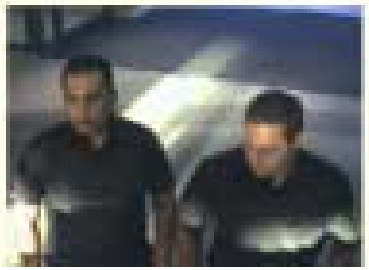

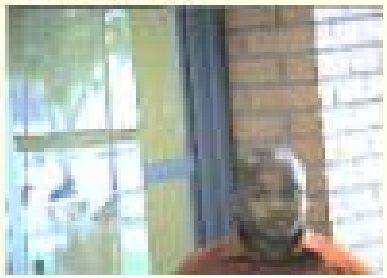

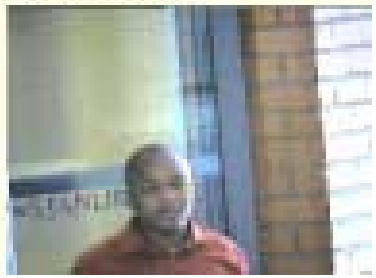

FACIAL IDENTIFICATION RESULTS: 31 977 images analyzed for duplication

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Facial Recognition

3D System

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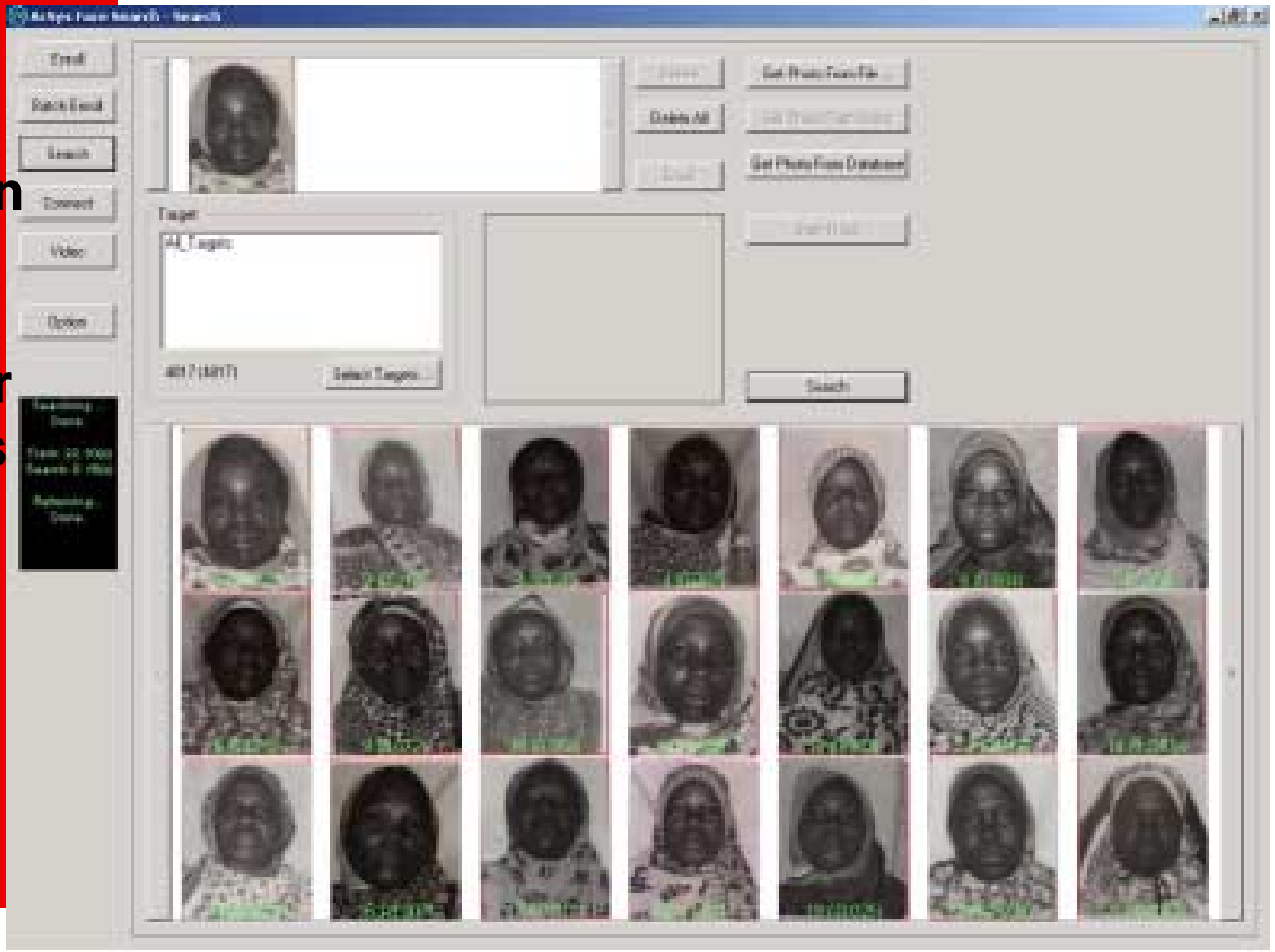
- Once enrolled each of images was compared to every image in the DATABASE

EXAMPLE 1

The first image is an EXACT MATCH, evey other image has a lower score compared to image being compared



Facial Recognition

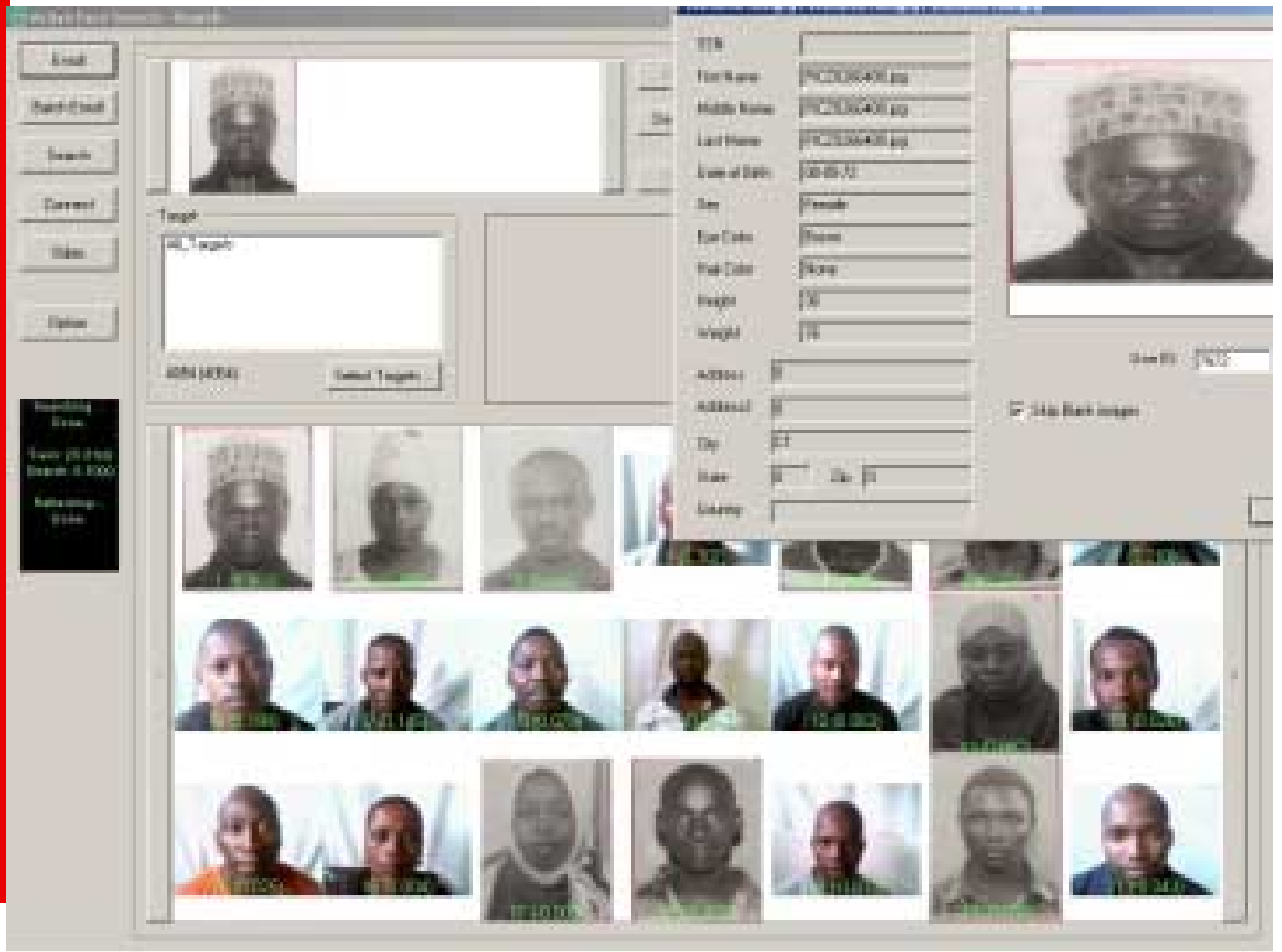
3D System

EXAMPLE 6

This is an example of a suspected duplicate, BUT NO DUPLICATE MATCHS WERE FOUND.

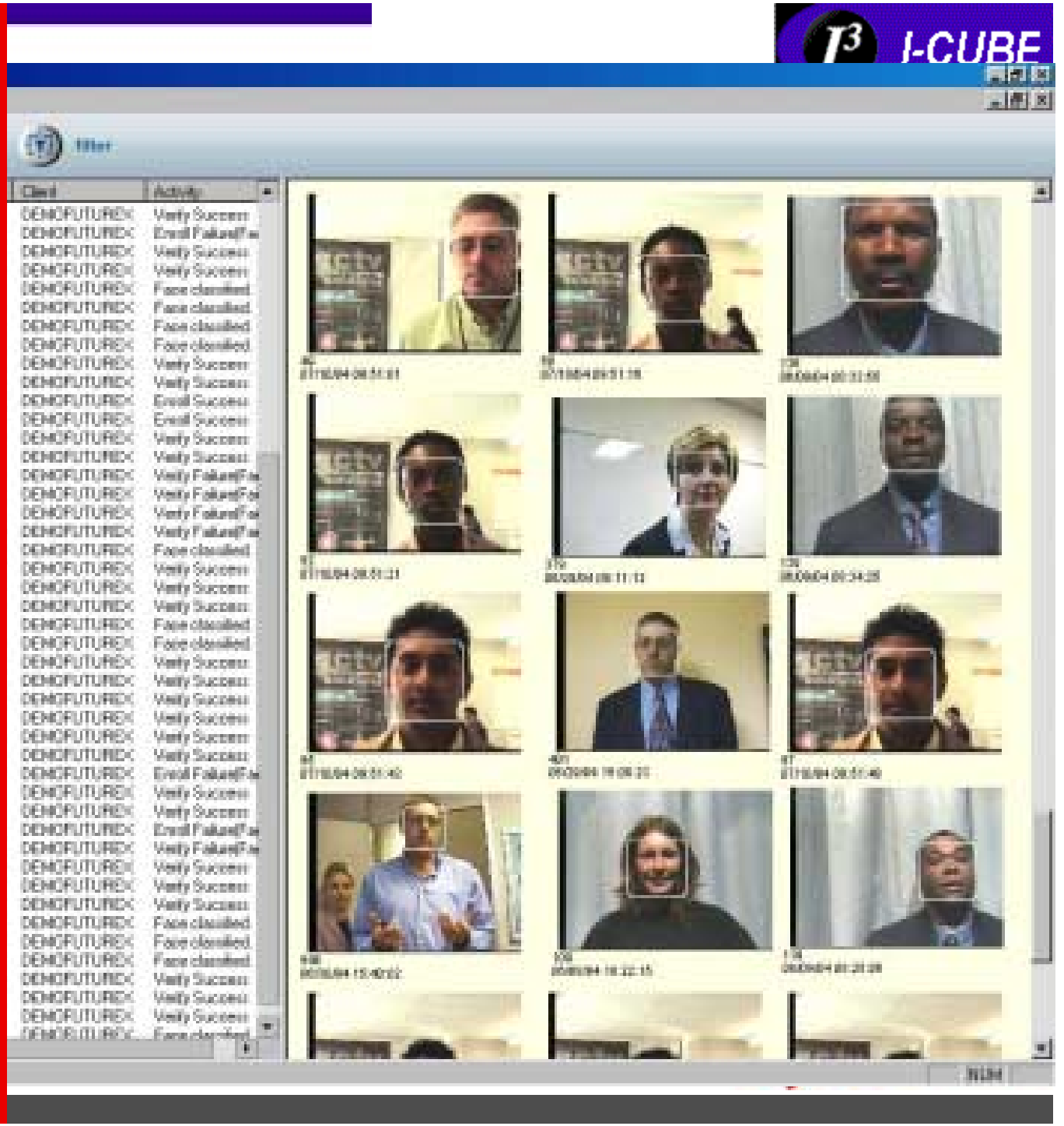
I-CUBE *Solutions*

- The presence of a HAT OR SCARF made no difference to the results obtained



Facial Recognition

System – LOG of all FACES which appear in front of any camera connected to the software.



Questions

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