

FACIAL IDENTIFICATION RESULTS: 31977 images analyzed for duplication

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Two systems were used for the analysis:

- A traditional 2D analysis (all **31977** images)
- An advanced 3D analysis (4 000 images ONLY due to time limitations)



Facial Recognition

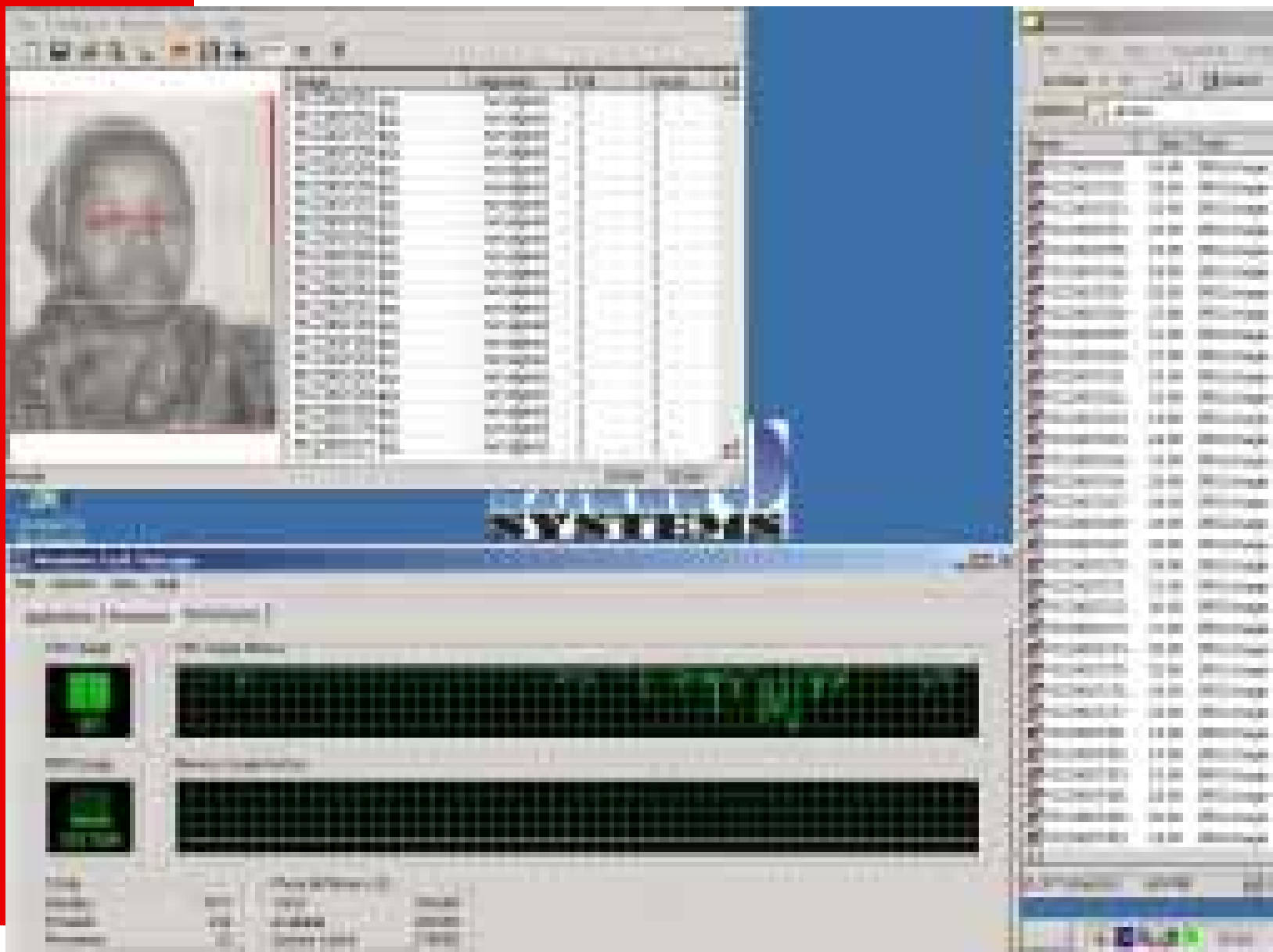
2D System

3D System

Facial Recognition

ALIGNMENT took around 1 second per image

2D System

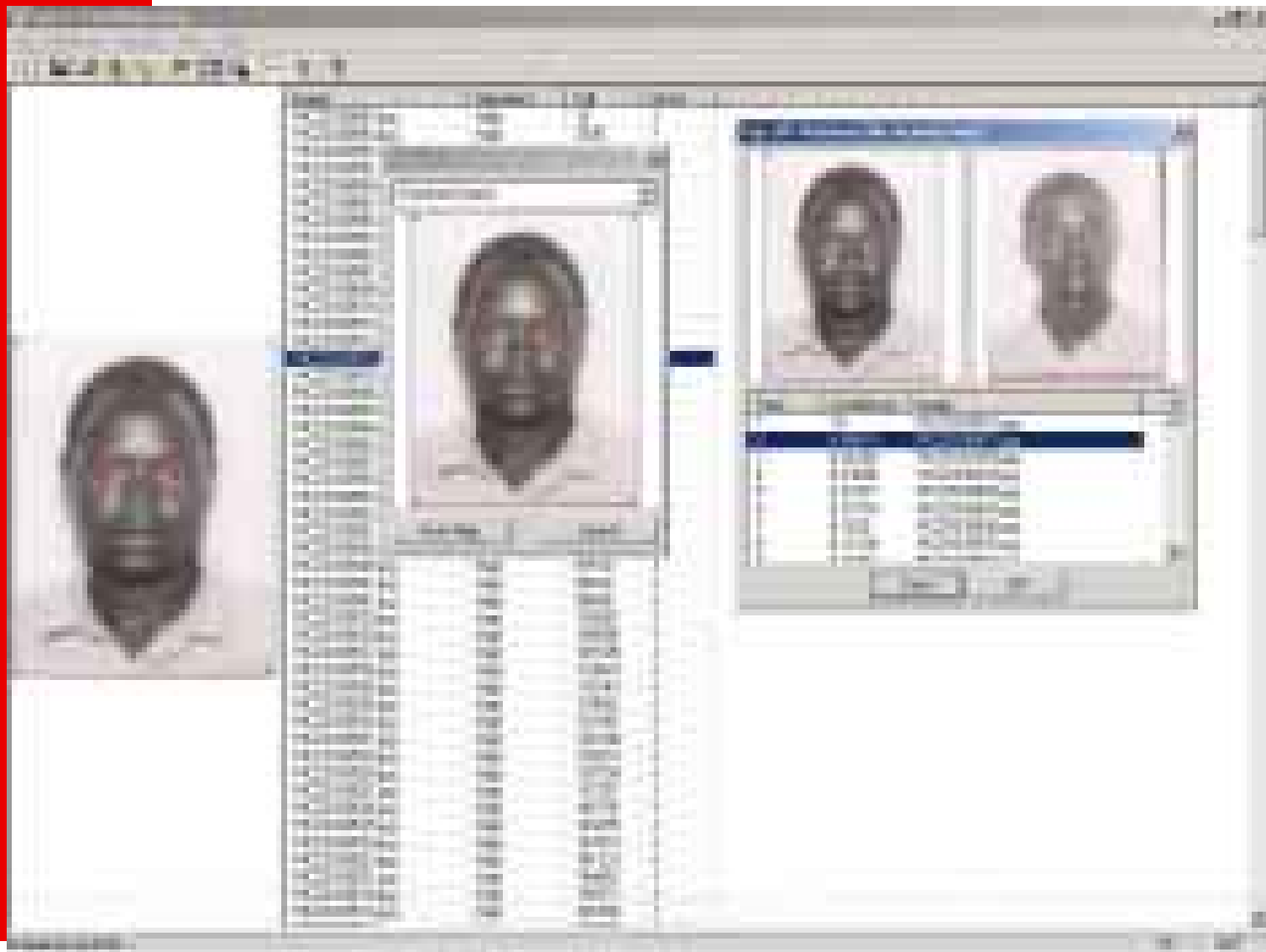


Facial Recognition

2D System



AFTER ALIGNMENT EACH IMAGE WAS COMPARED TO EVERY IMAGE IN THE DATABASE



Facial Recognition

2D System

1	10
2	8.26619
3	8.26268
4	8.23806
5	8.23371
6	8.17779
7	8.1525
8	8.12338
9	8.11942
10	8.1091

AFTER ALIGNMENT EACH IMAGE WAS COMPARED TO EVERY IMAGE IN THE DATABASE

PICZ0338572.jpg	11	8.10222	PICZ0338590.jpg
PICZ0338571.jpg	12	7.99342	PICZ0338586.jpg
PICZ0162383.jpg	13	7.98174	PICZ0338380.jpg
PICZ0338376.jpg	14	7.98128	PICZ0338363.jpg
PICZ0338565.jpg	15	7.97555	PICZ0338399.jpg
PICZ0338591.jpg	16	7.95411	PICZ0162382.jpg
PICZ0338596.jpg	17	7.89517	PICZ0338393.jpg
PICZ0338597.jpg	18	7.88028	PICZ0338370.jpg
PICZ0338563.jpg	19	7.84406	PICZ0162397.jpg
PICZ0338574.jpg	20	7.831	PICZ0162398.jpg
	31	7.60877	PICZ0338377.jpg
	32	7.59173	PICZ0162378.jpg
	33	7.53163	PICZ0338398.jpg
	34	7.49768	PICZ0162355.jpg
	35	7.49326	PICZ0162393.jpg
	36	7.47952	PICZ0338352.jpg
	37	7.46202	PICZ0338582.jpg
	38	7.45846	PICZ0338384.jpg
	39	7.45282	PICZ0338366.jpg
	40	7.43753	PICZ0338579.jpg
	41	7.4218	PICZ0162387.jpg
	42	7.39776	PICZ0338569.jpg
	43	7.36957	PICZ0338356.jpg
	44	7.35373	PICZ0338357.jpg
	45	7.33518	PICZ0338112.jpg
	46	7.3326	PICZ0338355.jpg
	47	7.33011	PICZ0162374.jpg
	48	7.32833	PICZ0162364.jpg
	49	7.32394	PICZ0162363.jpg
	50	7.31727	PICZ0162365.jpg



Facial Recognition

2D System

EXAMPLE 1

AFTER ALIGNMENT EACH IMAGE WAS COMPARED TO EVERY IMAGE IN THE DATABASE

1 10

This indicates AN EXACT MATCH

PICZ0338572.jpg

2 8.26619

Every other image in the database is then ranked against this image

PICZ0338571.jpg

11	8.10222	PICZ0338590.jpg
12	7.99342	PICZ0338586.jpg
13	7.98174	PICZ0338380.jpg
14	7.98128	PICZ0338363.jpg
15	7.97555	PICZ0338399.jpg
16	7.95411	PICZ0162382.jpg
17	7.89517	PICZ0338393.jpg
18	7.88028	PICZ0338370.jpg
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43	7.36957	PICZ0338356.jpg
44	7.35373	PICZ0338357.jpg
45	7.33518	PICZ0338112.jpg
46	7.3326	PICZ0338355.jpg
47	7.33011	PICZ0162374.jpg
48	7.32833	PICZ0162364.jpg
49	7.32394	PICZ0162363.jpg
50	7.31727	PICZ0162365.jpg

Facial Recognition

AFTER ALIGNMENT EACH IMAGE WAS COMPARED TO EVERY IMAGE IN THE DATABASE

2D System

EXAMPLE 2

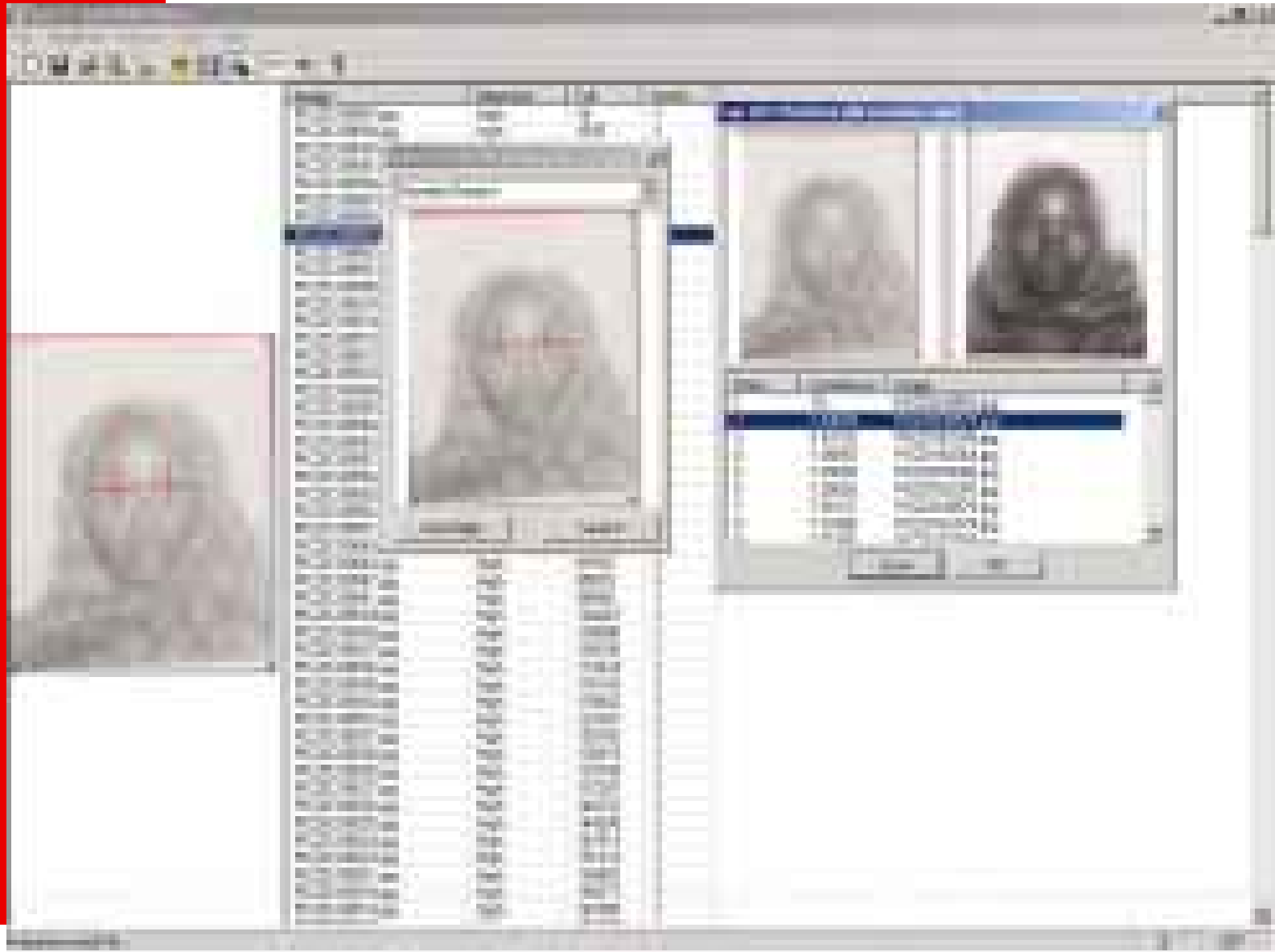


Facial Recognition

AFTER ALIGNMENT EACH IMAGE WAS COMPARED TO EVERY IMAGE IN THE DATABASE

2D System

EXAMPLE 3





Facial Recognition

2D System EXAMPLE 3

AFTER ALIGNMENT EACH IMAGE WAS COMPARED TO EVERY IMAGE IN THE DATABASE

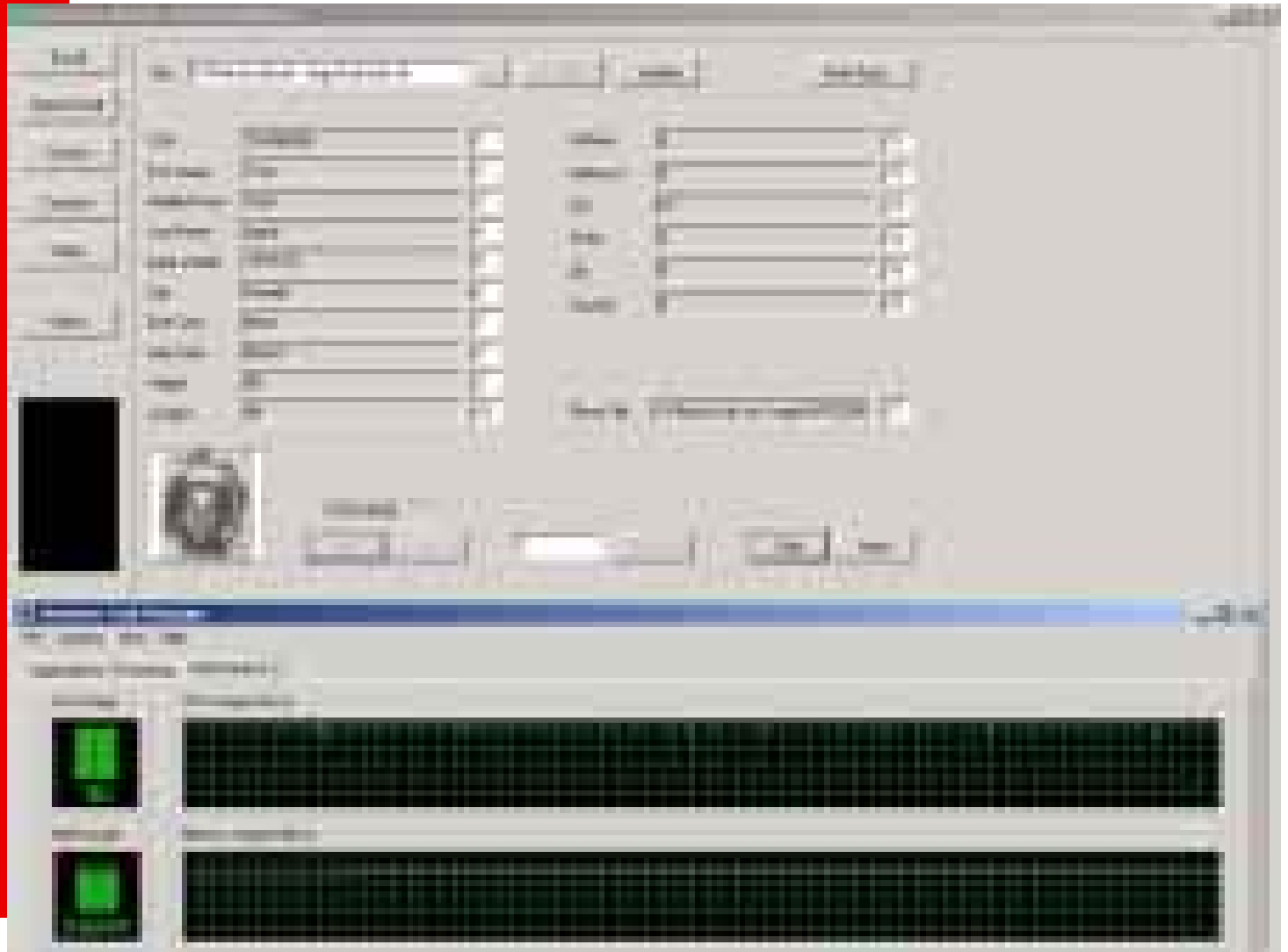
1	10	PICZ0338583.jpg			
2	7.44694	PICZ0338575.jpg	11	7.17993	PICZ0162354.jpg
3	7.43192	PICZ0162398.jpg	12	7.16664	PICZ0338380.jpg
4	7.36053	PICZ0162364.jpg	33	6.79341	PICZ0338596.jpg
5	7.35058	PICZ0338388.jpg	34	6.76138	PICZ0338376.jpg
6	7.26666	PICZ0162387.jpg	50	6.62713	PICZ0162352.jpg
7	7.26172	PICZ0338570.jpg	51	6.62654	PICZ0338572.jpg
8	7.24286	PICZ0162374.jpg	221	5.27165	PICZ0338035.jpg
9	7.21865	PICZ0162359.jpg	222	5.27105	PICZ0162416.jpg
10	7.19932	PICZ0162383.jpg	276	4.55506	PICZ0338189.jpg
			277	4.53467	PICZ0338528.jpg
			278	4.5313	PICZ0338033.jpg
			279	4.52284	PICZ0338149.jpg
					ETC

Facial Recognition

3D System



- The enrolment used both CPU and MEMORY, unlike the 2D, which used only CPU

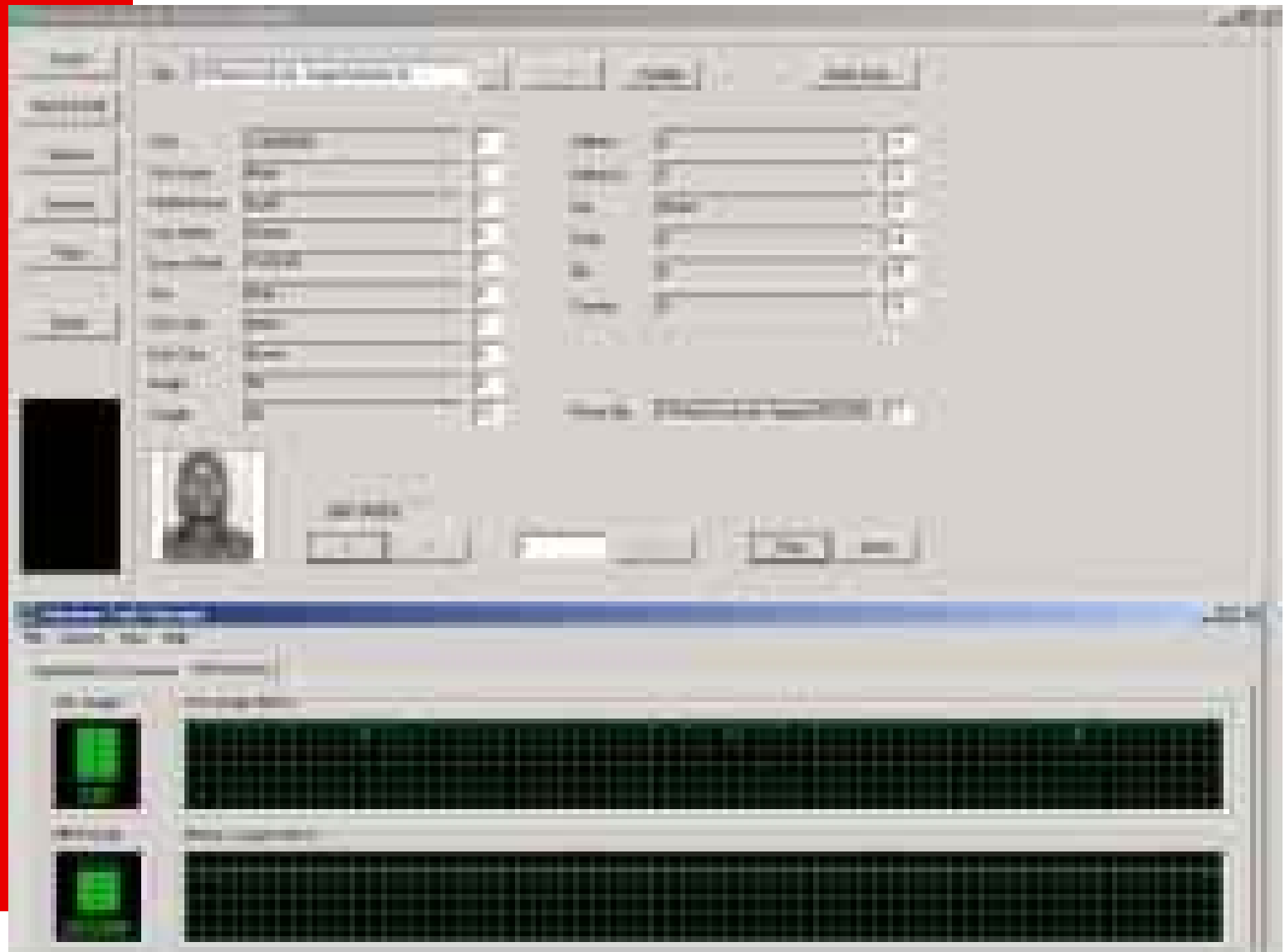


Facial Recognition

3D System



- Enrolment of 4000 images into the database

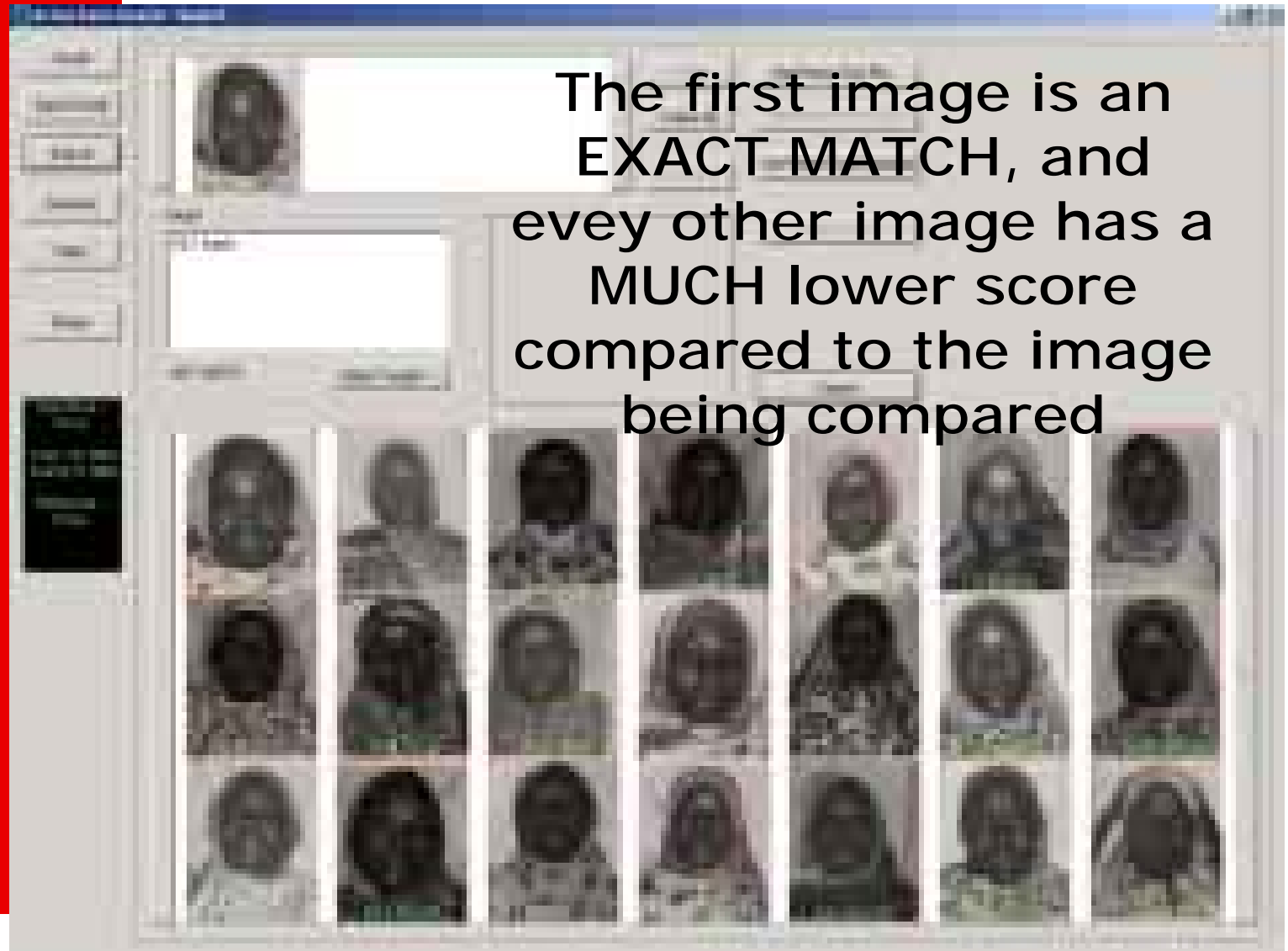


Facial Recognition

3D System

EXAMPLE 1

- Once enrolled each of the 4000 images in the database was compared to every image in the DATABASE



Facial Recognition

3D System

EXAMPLE 2

The first image is an **EXACT MATCH**, and every other image has a **MUCH** lower score compared to the image being compared

- The information stored with each image can be reviewed to check for a possible match



Facial Recognition

3D System

EXAMPLE 3

The scores are normally not close (0.1.007 compared to 0.521), showing the people are very different

IMAGE VALUES



Facial Recognition

3D System

EXAMPLE 4

This is the **ONLY** possible **MATCH** found, where the scores are **VERY** close (0.969 compared to 0.941)

- THIS IS THE SAME IMAGE, with different eye positions



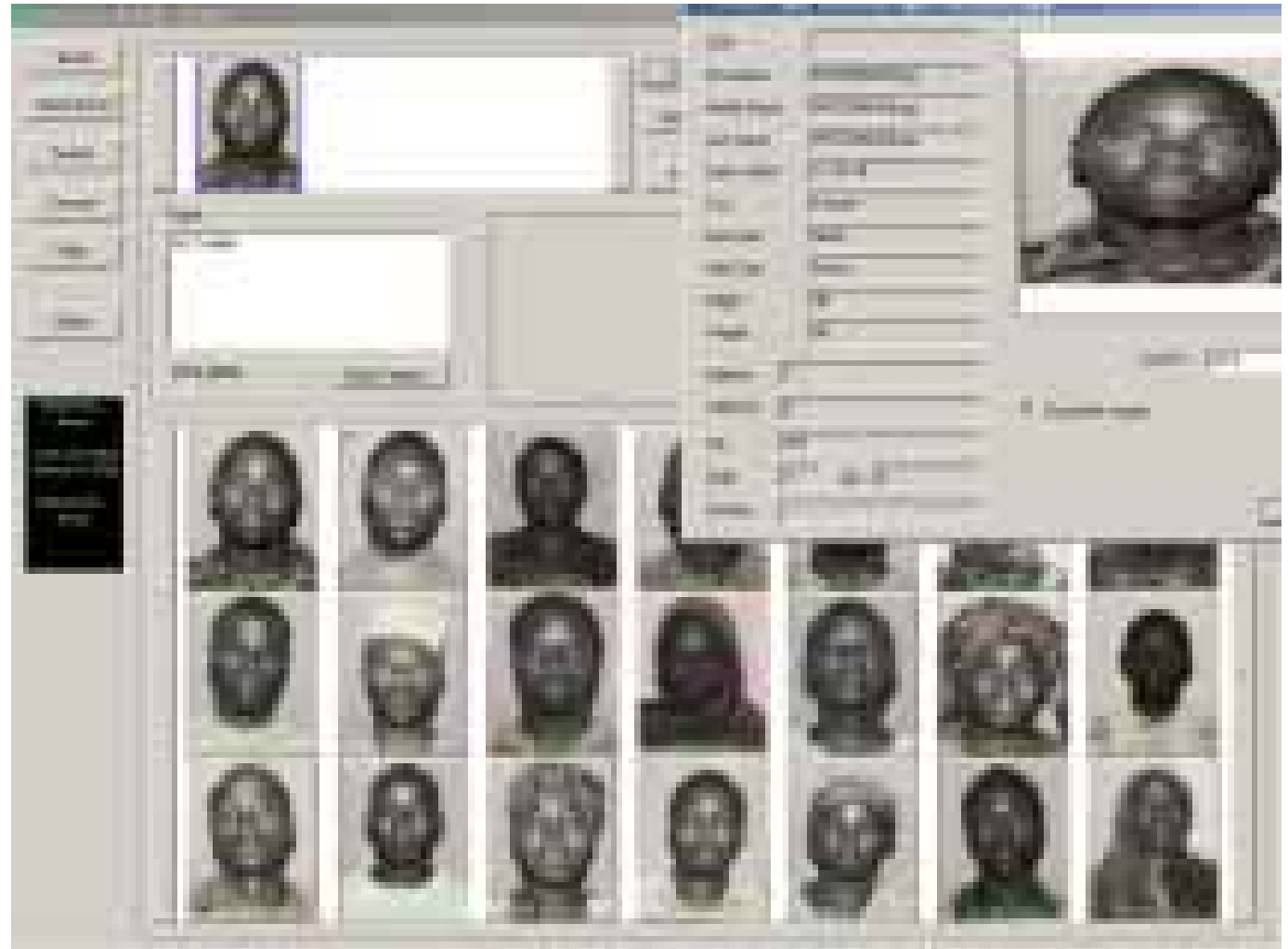
Facial Recognition

3D System

EXAMPLE 5

This is an example of a suspected duplicate (1 of 667 images), BUT NO MATCH WAS FOUND.

RESULTS FROM POSSIBLE DUPLICATES



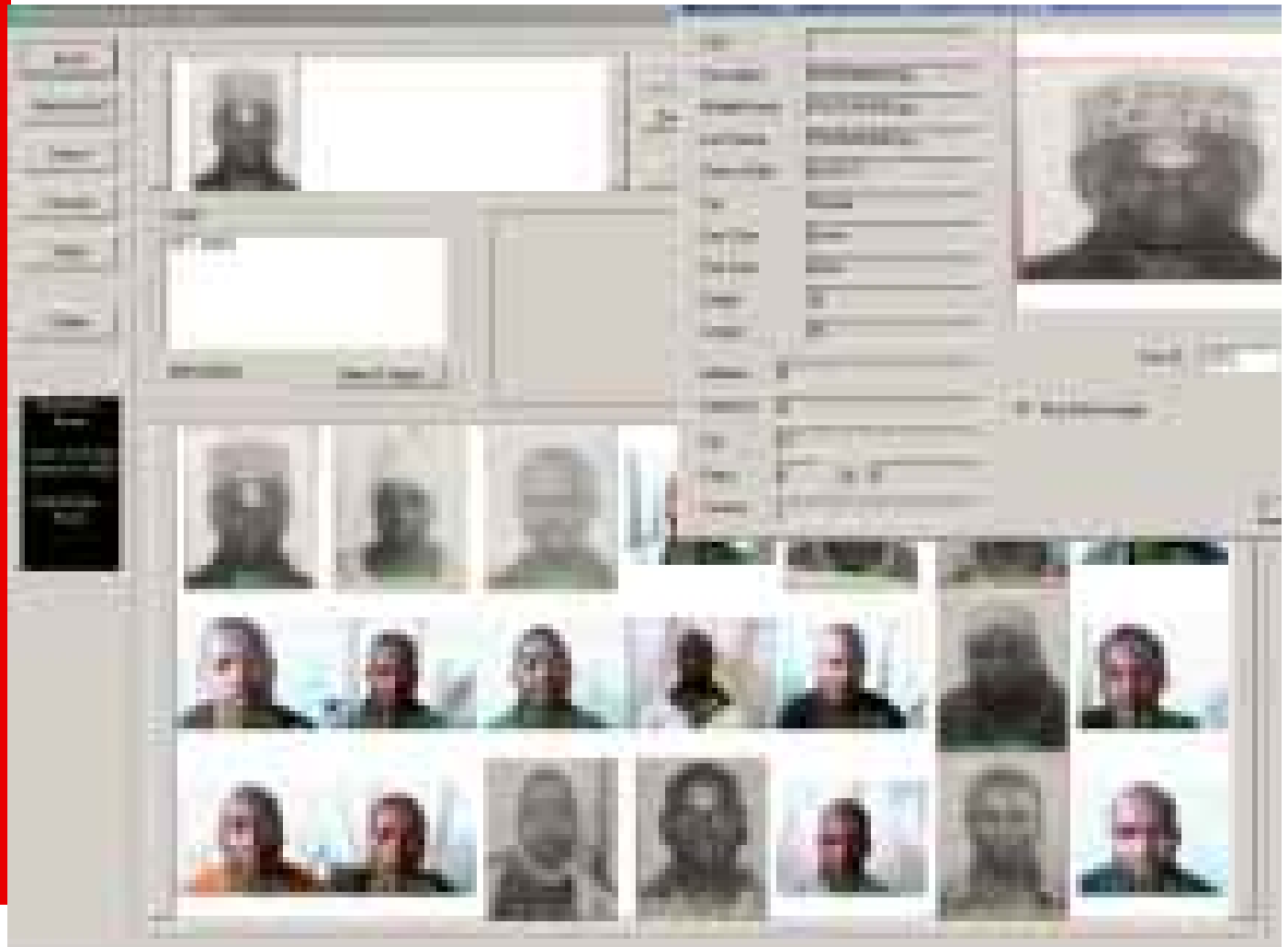
Facial Recognition

3D System

EXAMPLE 6

This is an example of a suspected duplicate (667 images), BUT NO DUPLICATE MATCHS WERE FOUND.

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

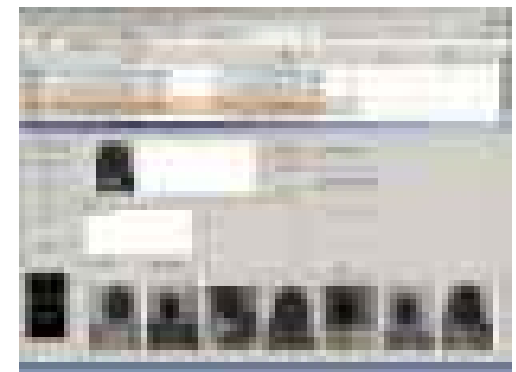
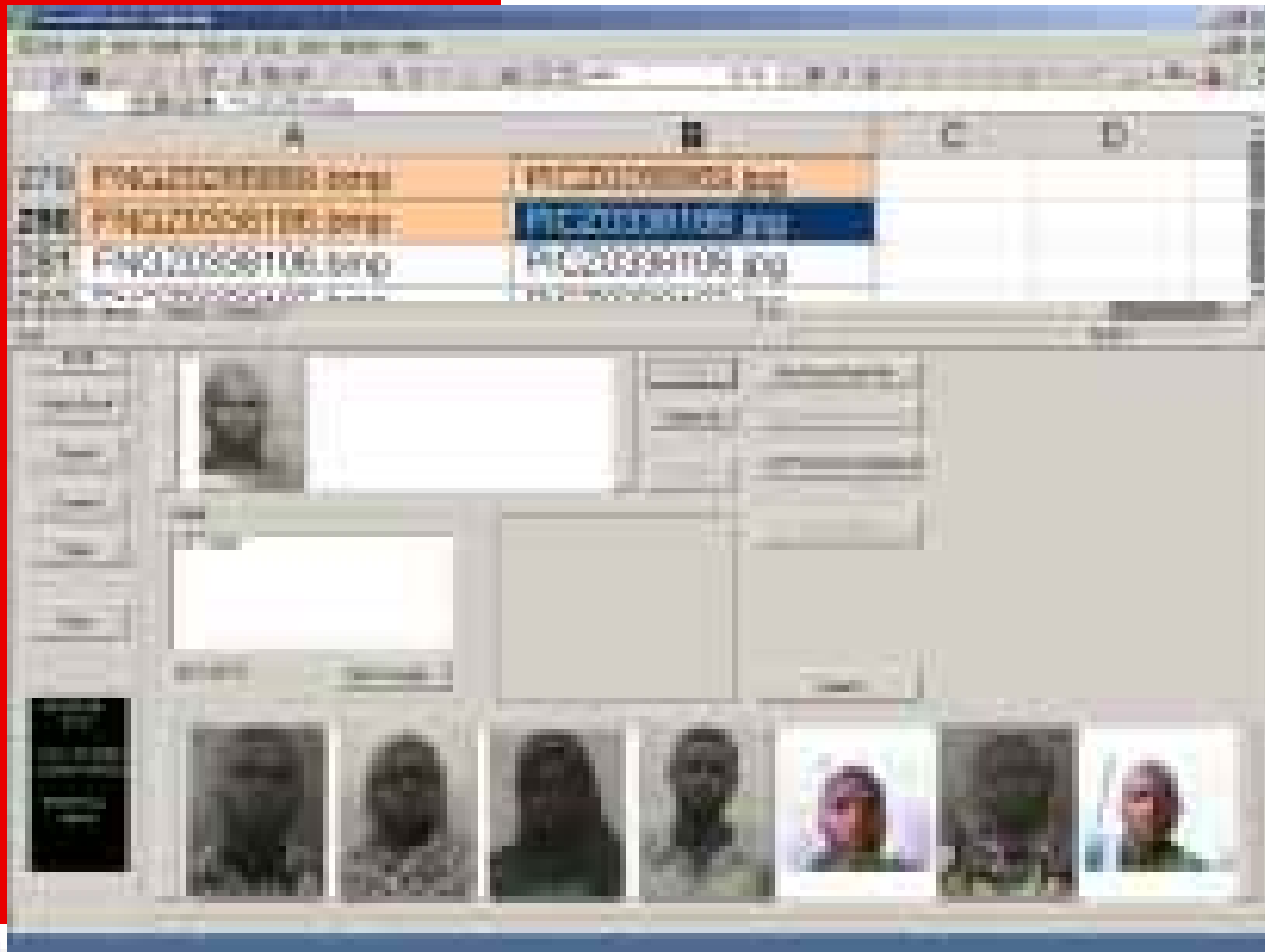


Facial Recognition

3D System

EXAMPLE 7

Examples (3) of suspected duplicates (667 images), where no match found at all in the DB.



Requirement: With a sub-set of 31 977 images, check for:

Photo rejection- 0.05% (once enhanced)

Photo Automatic enrolment – over 70% (with training)

Manual enrolment / checking - 28% (less than)

Duplication Checking – 0 FOUND