

BioFace[®] Sky Eagle

Criminal Identification from Recorded Surveillance Video



PROBLEM: A large city in Asia maintains a registry of facial images for all citizens. (Registration is required by law.) The registry database contained over 12M facial images. The police department developed this registry to identify criminals who had been captured on video by surveillance cameras. As a manual process, this was labor intensive, slow, and minimally effective.

SOLUTION: The BioFace[®] Criminal Investigation and Detection System (CIDS), aka 'Sky Eagle' is a fully automated Facial Recognition (FR) application to match a facial image to an entry in the registry. CIDS was implemented with the BioFace[®] Automated Biometrics ID System, a powerful software platform and SDK for application development.



The municipal government significantly expanded their network of surveillance cameras in areas with dense pedestrian traffic (transportation hubs, government buildings, sports arenas, etc.). This dramatically increased the number of crimes captured on video.

This video often presents special challenges to Facial Recognition:

- There are potentially many, many faces in any frame of the video.
- The criminals' face may be partially obscured.
- The cameras are generally of fairly low quality and placed far from the faces. In fact, because the cameras are often quite high, the project was dubbed 'Sky Eagle'.

BioFace[®] enables a user of a CID System Client (typically a Police Officer) to review the crime scene video, pause at a frame with the best picture of the criminal, and select one of the identified faces. The system then extracts the face and seeks a match in the database. For a partial face or very poor quality image, the system returns multiple (typically 20-25) partial and potential matches. At that point the Police Officer has a reasonable list of suspects for the investigation.

IMPACT: CIDS has been in daily use since its completion in June, 2007. Suspects are quickly identified, resulting in a significant reduction in the time to close cases. Also, use of CIDS has increased the percentage of crimes closed.

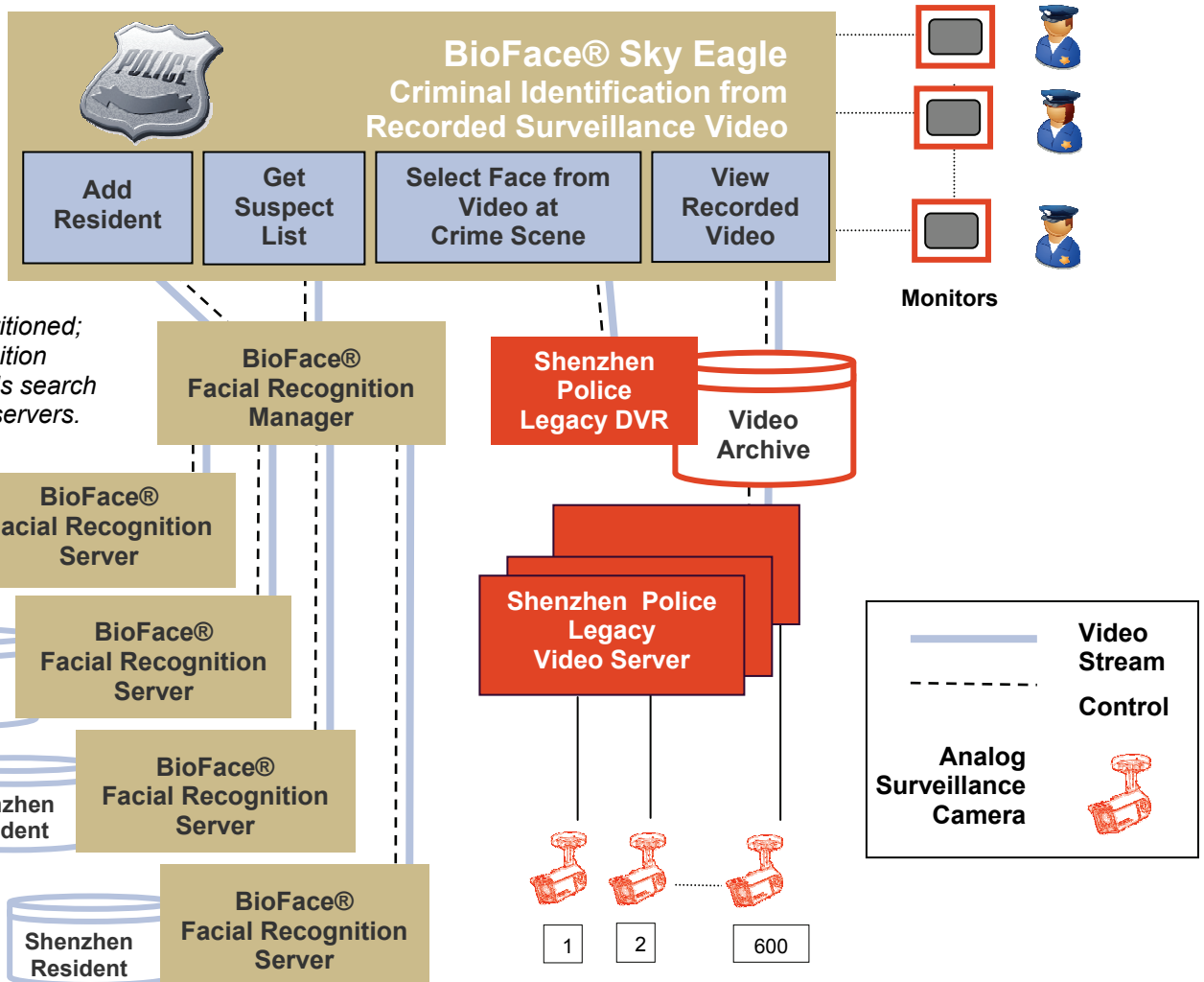
CHARACTERISTICS

Market	Municipal Law Enforcement
Client	Police Department Investigative Division
Location	Large Asian City
Integrator	PinnacleSoft Technologies
SW Platform	BioFace [®] Automated Biometrics ID System
FR Algorithm	L1 Faceit [®] G6
Source Image	Pre-Recorded Video or Still
Cameras	Analog, 520 lines

FEATURES

Database Size	Very Large: 15 Million Facial Images
Database Content	All Residents
Search Type	1:N
Network	Private WAN
Facial Recognition Server	4 IBM BladeCenters 13 blades, 2G RAM Intel dual Xeon 3.6 Mhz
Clients	>200 HTTP Connected
Performance	- Realtime Search/Match 1M templates /sec / proc - Template Creation 1sec / template / proc

At right, note the display of 15 thumbnails for the possible facial matches against the extracted image, ordered by match ranking.



Database Partitioned;
Facial Recognition
Manager sends search
request to all servers.

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