UBITRON *FACE·RECOGNITION·SYSTEM*

1. Core Characteristics of Our Face Technology

- **High Speed Facial Image Cropping and Recognition**
- **Centralized Video Surveillance Platform**
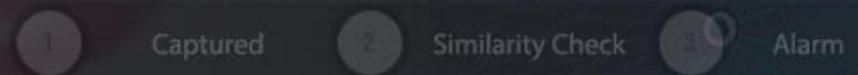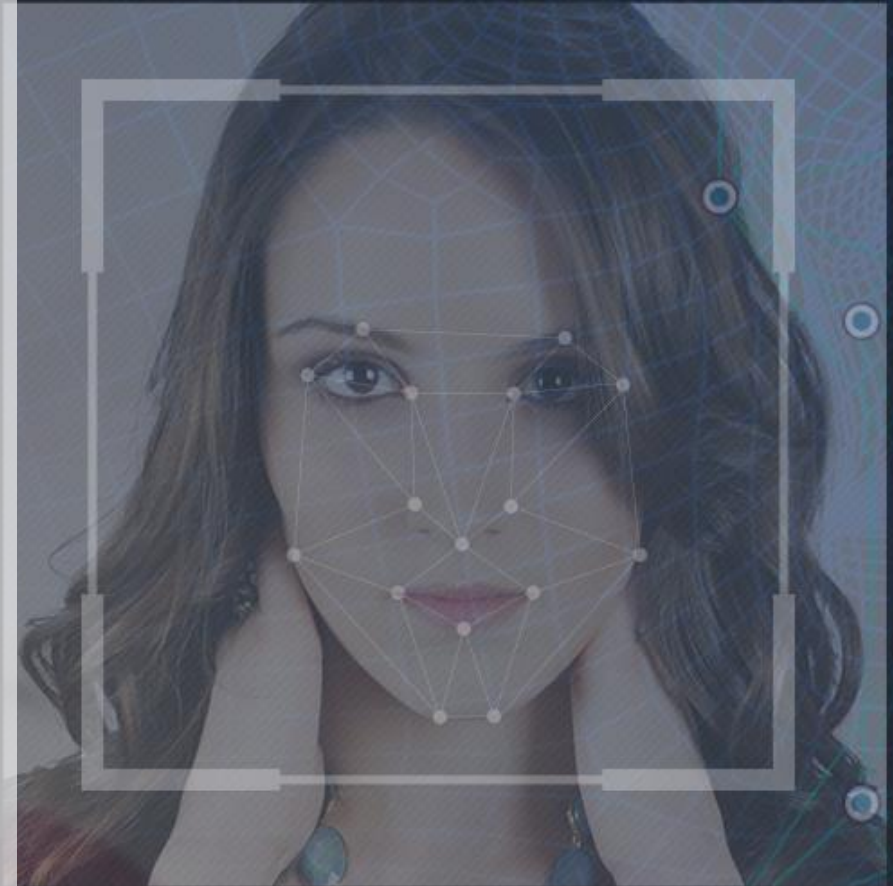- **Affordable System for 3rd Party Products**
- **Retrieves visual information from Inherited system**
- **Integrated with Hardware and Software Solution**
- **Selectable H/W Options by Functional Requirements**
- **Powerful Processing with Slim CPU**
- **Simplified System Structure**

Captured   Similarity Check   Alarm

2. Major Application

| Core Technology	Major Application
Facial Recognition Technologies	Video Security / Surveillance
Gesture Recognition	Intelligent Safety Control
Plat Number Recognition	Remote ID Card Verification
Color Recognition	Retail Solution/ Shopping Mall
Behavior Recognition	Healthcare / Ordering System
People Move Recognition	Smart City / Safe City / U-Health
	Train / Subway Station / Robot
	Bank /Internet Finance
	School / APT / Building Security
	FMS / IBS / Gate Control
	Queuing System

High Accuracy Perception Engine (upto 99.9 %)

Core Engine Technology of Deep Learning

Hardware Platform (Server Based)

3. System Configuration
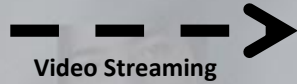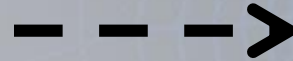
Camera - - - → **NVR** - - - → **NVR Station**
Video Streaming *Analytic SW*

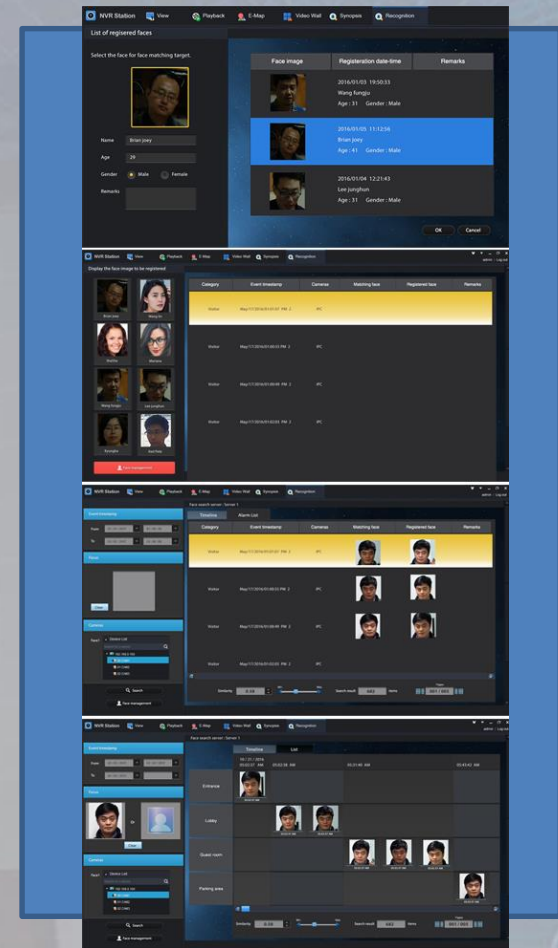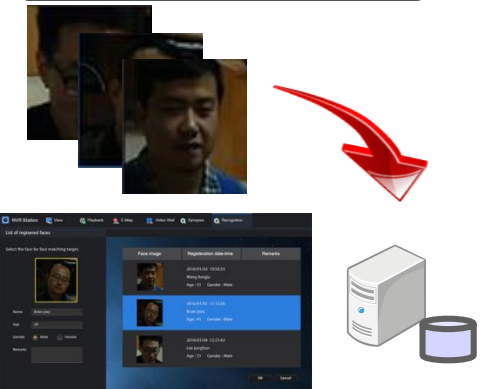

Record Video Streaming

Live Video Streaming

Facial Image Process

3. System Configuration

1 Register the suspicious person

- Register face images on blacklist DB
- Suspicious Target Select and Search

2 Notify the alarm of face matching

!! Alarm !!

- Face Matching
- Alarm Linkage when matched

3 Alarm PoP Up to Video and E-Map

E-map, Live & Matching Window
(Systemized Alarm Linkage Solution)

- CMS Pop-Up Display
- TV Wall PoP-Up Display

4 Keep track by face search

Time-Bar

Camera Location

Keep track of suspicious person among Black List

5 Dedicated Playback by One-Click

When click suspicious matching target , the stored image and video clip is streamed by NVR.

3. System Configuration

When someone is detected face image is matched with registered one, alarm is generated by real time, and it is listed in alarm history.
The Matching Result on Suspicious target will attributes information such as Camera, Age , Gender including Detected Time information
The system streams and uploads the facial images to NVR in order to import and matching every face images passed by target cameras by one click.

All the matching face List which is registered

Narrow your search with day/time information

Target Analyze by One Click

Narrow your search from cameras list

Narrow your search with a Target face image from Camera and Location

4. Face Recognition Process

4.1 Facial Detection

In still images or video streams, face detection technology can quickly and accurately detect the location of multiple faces. Ubitron's face detection technology for light changes, angle changes, different skin color, different ages have better adaptability to the human face. Our face detection algorithm overcomes the face detection of several problems: side face, semi-occlusion, fuzzy face, which greatly enhance the reality of a variety of face detection results.

4.2 Facial Image Cropping
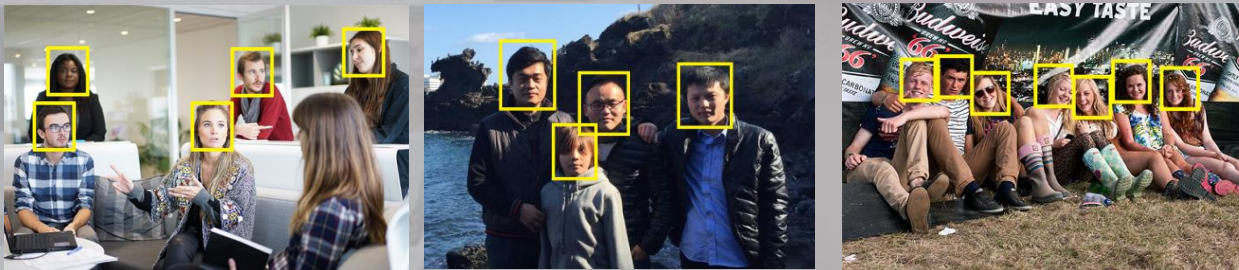
Face Image Cropping is one of the key technology which extracts the target facial image through the cropping camera or middle server which are specially integrated with cropping algorithm inside to process quickly and accurately that identify the target face belongs to the person.

4. Face Recognition Process

4.3 Facial Identification Points

In the face detection, the identification points (eye, eyebrows tip, mouth, nose, etc.) can be expressed in image coordinates, the number of feature points (21 points, 106 points) can be expressed with different accuracy of the face changes. Face detection technology using the latest cascade regression algorithm, combined with the depth of learning features initialization , the integration of multiple different standards of multi-point data set of knowledge, making the same model can be applied to a different number of key points detection in order to guarantee the lower error and better adaptability.
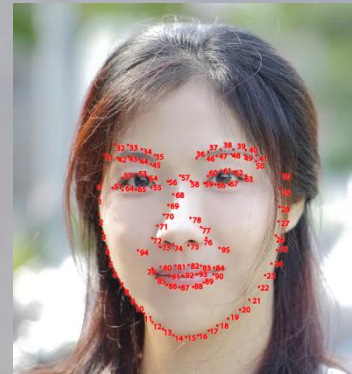
< From 21 Points >   **< From 106 Points >**

4.4 Facial Verification

Face Verification can calculate the similarity of two faces to determine whether the same person.

4. Face Recognition Process

4.5 Facial Clustering

On the album and other scenes by face clustering function, you can put the same person's photos to view and manage.

4.6 Facial Library Search

Face database search module can be used to quickly search for similar face data in large-scale face database to identify the identity, can be used for star search, monitoring and tracking criminals and other fields. This system can quickly find similar faces in the face database of more than one million levels by pre-creating the facial feature index of the personnel under investigation.

5. NVR Station (SW Functions by Version)

	Ultimate	Enterprise	DEMO	Light
Main Application	Every Public Places , Train/Subway Station, Smart/Safe City , Big Data	BUILDING, SCHOOL, CHURCH, APT, Retail Solution , KIOSK , Face Pay, POS Remote Identification	DEMO	POS
OS	WINDOWS, LINUX , Android	WINDOWS, LINUX, Android	WINDOWS	WINDOWS, LINUX , Android
Camera Type	IP Camera (2 M Pixel or More)	2 M Pixel or More	2 M Pixel or More	1.3 M Pixel or More
Promotional Option	Provide API or SDK	None	Provide Required company Logo	None
License Duration	Permanent	Permanent	Permanent	4 years
License Price	To be informed	To be informed	To be informed	To be informed
Camera numbers Per Server	4 Camera Per PC Server Unlimited Expansion (Stack up)	4 Camera Per PC Server	1 Camera Per PC Server Unlimited Expansion (Stack up)	1 Camera per Device
Recommend Camera Brands	KEDACOM, UBITRON (Onvif Supported)	KEDACOM, UBITRON (Onvif Supported)	KEDACOM, UBITRON (Onvif Supported)	KEDACOM, UBITRON (Onvif Supported)
Face Cropping Speed	Within 1 second per 60 faces	Within 1 second per 10 faces	Within 1 second per 5 faces	1 second per 1 faces
Recognition File Type	H.264, BMP, JPG, PNG	H.264, BMP, JPG, PNG	H.264, BMP, JPG, PNG	H.264, BMP, JPG, PNG
H/W Spec	Above Intel i7 , RAM 8G	Above Intel i7 , RAM 8G	Above Intel i5 , RAM 4G ARM V7Android 4.0	ARM V7Android 4.0
Face images to be registered	Unlimited Faces (To be informed)	Max. 100K Faces	1 K Faces	1K faces
Face Matching Speed	1 seconds per 100K faces	1 seconds per 100K Faces	1 seconds per 1K Faces	1 seconds per 1 K faces
Intelligent Alarm Linkage	Included	Included	Not Included	Not Included
Dispay Expansion	Upto 4 Monitor Screen	Upto 4 Monitor Screen	Not Included	Not Included
E-Map	Included	Included	Not Included	Not Included

5. NVR Station (SW Functions by Version)

	Ultimate	Enterprise	Demo Version	Light
TV-Wall Control	Included, Provide SDK Ver. 1.2	Basic Function by Standard Device Option	Included	Not Included
System Integrator Package	Included, Provide SDK Ver. 1.2	Basic Function by Standard Device Option	Not Included	Not Included
Alarm Expansion Control	Included, Provide SDK Ver. 1.2	Basic Function by Standard Device Option	Not Included	Not Included
Door Access Control	Included, Provide SDK Ver. 1.2	Basic Function by Standard Device Option	Not Included	Not Included
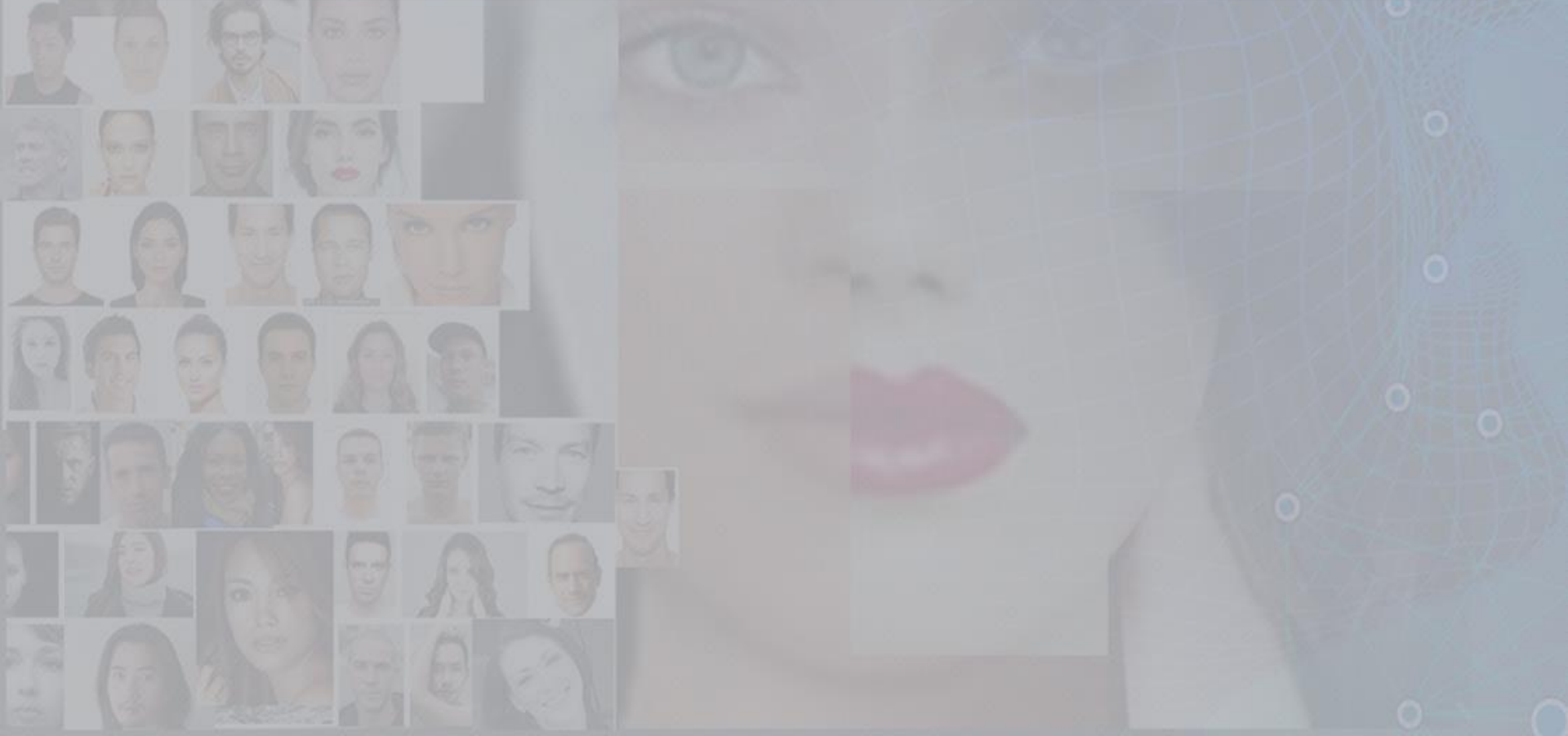
6. Main Functions

Ubitron's Face solution receives the Live streaming via IPC and NVR and it can be selected by the S/W Option.
As soon as it receives the streaming , it starts to detect and do cropping the multiple faces quickly and accurately so as to so
match huge numbers of multiple Faces captured by multiple IP cameras and then it displays the matching results.

The stored face image scanned with using Face matching solution and then Black or White List can be marked by bright background pattern.

**When it is matched to DB , the face image is displayed with bunches of information such as the captured time frame, camera location and registered Face Image.**

(Display sorted by Camera and NVR)

6. Function Details

Facial Image can be uploaded via Intelligent Camera or Server directly to NVR and it can be downloaded and scanned to matching server simultaneously multi-numbers cameras .

Here, we announce that our Face Search Function as long as customer use our NVR where our matching solution is embedded to search aimed facial object through recording Video and stored Images which is special enabled by H/W integration so that users can do tracking the target object through any brand of camera video source and Facial Images..
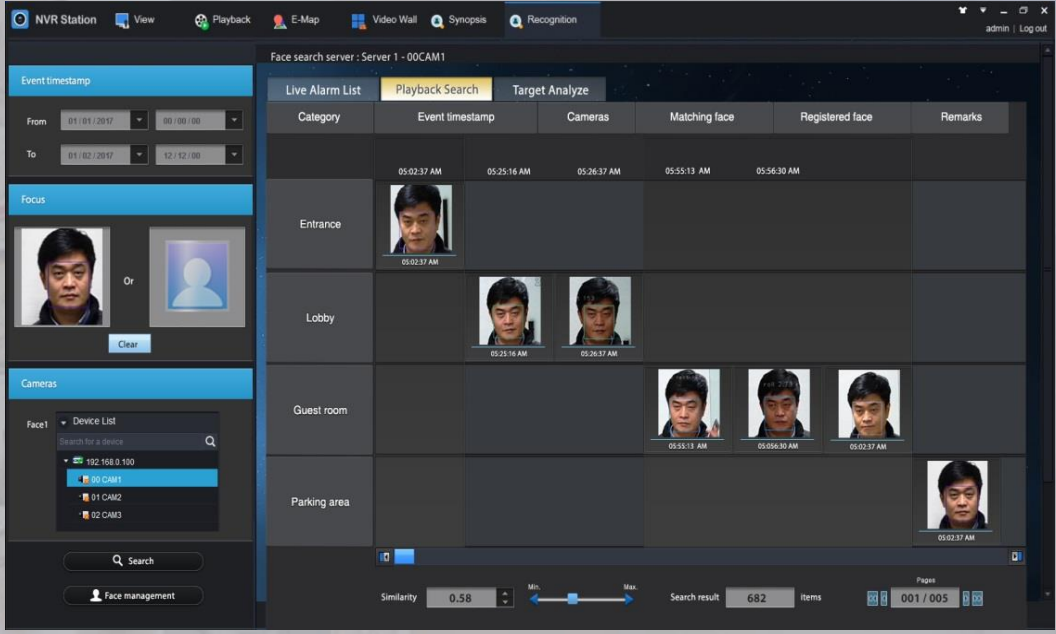
(Display sorted by Camera and NVR)

6. Function Details

6.3 Target Analyze

Target Analyze support helps operator to do smart search function for the selected Face Target which is just one of the aimed face to search and review more details when and where the target is captured.

At Target Analyze Tab, Operator can recognize the detailed captured time and Camera location by selecting the target face image search function.

6. Function Details

By One Click Playback, it uses functionally integrated NVR which has special Folder to send and receive multiple images with very special playback function where operator can use playback function by One clicking the Target Face .

By Target Analyze, Face Search result will be displayed with time frame and the video clip can be displayed with detailed attribute information

(Display sorted by similarity)

6. Function Details

When it comes to One Click function, it uses functionally integrated NVR which has special Folder to send and receive multiple images with very special playback function where operator can use playback function by One clicking the Target Face .

1. Live monitor   2. Matching Monitor   3. TV Wall   4. E-MAP
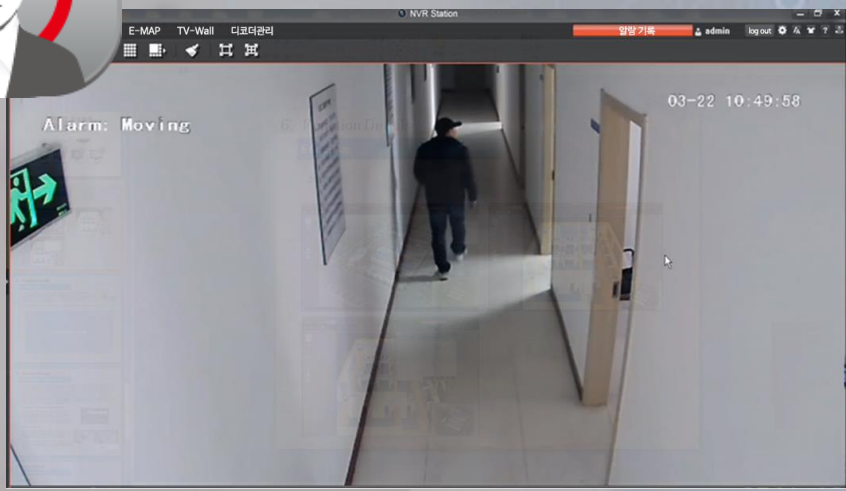
6. Function Details

Ubitron's E-Map Function support multi layer Alarm Linkage Solution based on multi images that makes customer detect and notify alarming sign through image and sounds.

6. Function Details

Ubitron's S/W Solution includes TV Wall Function which is a centralized center solution to manage every devices through our Controller.
As long as Monitoring Center has such integrated H/W, it can display real-time video image fluently and directly to the Monitors by the Alarm Linkage Signal.
Our Solution has specialized UI to manage unlimited input/output sources and external devices control deployed in Monitoring center.
TV wall basically works for splicing , splitting as a Display device and it also works for alarm linkage displaying functions as inherited features ,those features are packed with 1 powerful S/W Solution and it can decodes directly from IP Camera or NVR, so the output video image is displaying without latency which is less than 200ms if IP camera is connected directly. (Refer to 6.9)

6. Function Details

The video playback search is a time-consuming and painful work , people may feel tired staring at the screen for a long time, thus it is likely that important information is missed by fast forward (FF). UBITRON's NVR has intelligent analysis and retrieval technology are integrated, it can conduct motion detection analysis of the set area in the video in playback channel and display analysis results in a diagram on the time axis to help the user obtain relevant content quickly, therefore save time and enjoy convenience. Through camera failure surveillance, motion detection and trigger alarm of external signal, our NVR system can provide powerful alarm linkage function which includes starting alarm video recording, switching front-end image, rotation of preset, snap shot and acoustic-photoelectric alarm. NVR supports alarm linkage in defense area. When a certain front end in the same area produces alarm, it can link other frontend video recording, snap shot and rotation of preset so as to prevent loss of video recording on the site caused by artificial destruction

Alarm PoP-UP with Video Recording and Alarm Prerecording

When the alarm is triggered, Ubitron's Face recognition will detect the Face and Motion image as well as tempering , scene change such as Intelligent video images and then it may trigger the Alarm to NVR or IP Wall Controller so as to start video recording automatically.
Moreover, NVR has alarm prerecording function and can ensure integral video recording before and after alarm to help further tracking search.

Intelligent Video Retrieval

The video playback search is a time-consuming and painful work, people may feel tired staring at the screen for a long time, thus it is likely that important information is missed by fast forward (FF). Motion and Face image are integrated by retrieval technology .

It can conduct motion detection analysis of the set area in the video in playback channel and display analysis results in a diagram on the time axis to help the user obtain relevant content quickly, therefore save time and enjoy convenience.
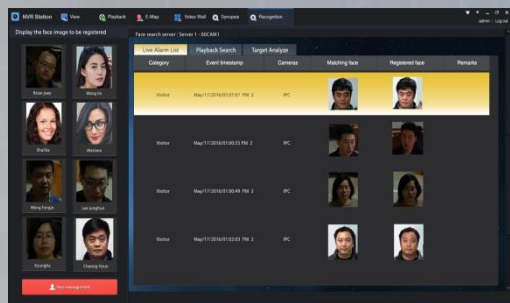
6. Function Details

When the alarm is triggered, the System integrated function can trigger the Alarm to IP Wall controller automatically , so monitoring center recognize the situation immediately and simultaneously.

4 channels 4K,16 channels 1080P, 36 channels 720P and 50 channels D1 for one board .

Standard H.265,H.264,and MPEG4 Code Streaming, customized OSD , real-time alarm reminder.

Splice, split mode(1/4/6/9/16/25), drag to replace target window, call preset, preset patrol, PTZ control, zoom in/out, video preview and play recorded streaming(RTSP Streaming).

Transfer video streaming from various brands of DVR/NVR and PC signal, and decode directly IPC(less than 200ms) to TV wall based on RTSP or Onvif protocol via cloud transmission.

Automatically identify the optimum resolution of the display equipment and manually change the output resolution, maximum output is 4K.

Management via Web, client S/W, keyboard or APP. Remote configuration, import & export for parameters, upgrade, reboot and other routine maintenance.

TV Wall / Alarm Linkage