HIKVISION

Configuration Guide of DeepinMind Facial Recognition NVR

iDS-77xxNXI-I4/(16P)/X(B)

HIKVISION UK PRODUCT TEAM
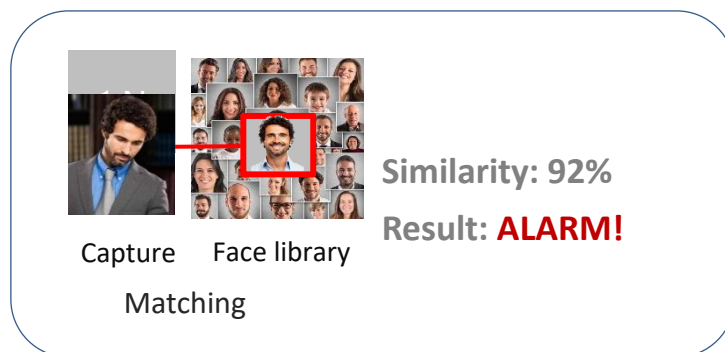
2019-08-07

How to setup face recognition system with DeepinMind NVR

This quick guide shows you how to set up face recognition system with iDS-77xxNXI-I4/(16P)/X(B).

All operations in the quick guide are based on GUI 4.0, V4.1.02.

1. Basic introduction

iDS-77xxNXI-I4/(16P)/X(B) is Hikvision's new AI NVR, with Hikvision deep learning algorithm, it can capture and recognize face.

iDS-77xxNXI-I4/(16P)/X(B) has a build-in SSD for database and support up to 50000 face pictures in face libraries, support 16-ch real-time face capture and comparison, and search by picture.
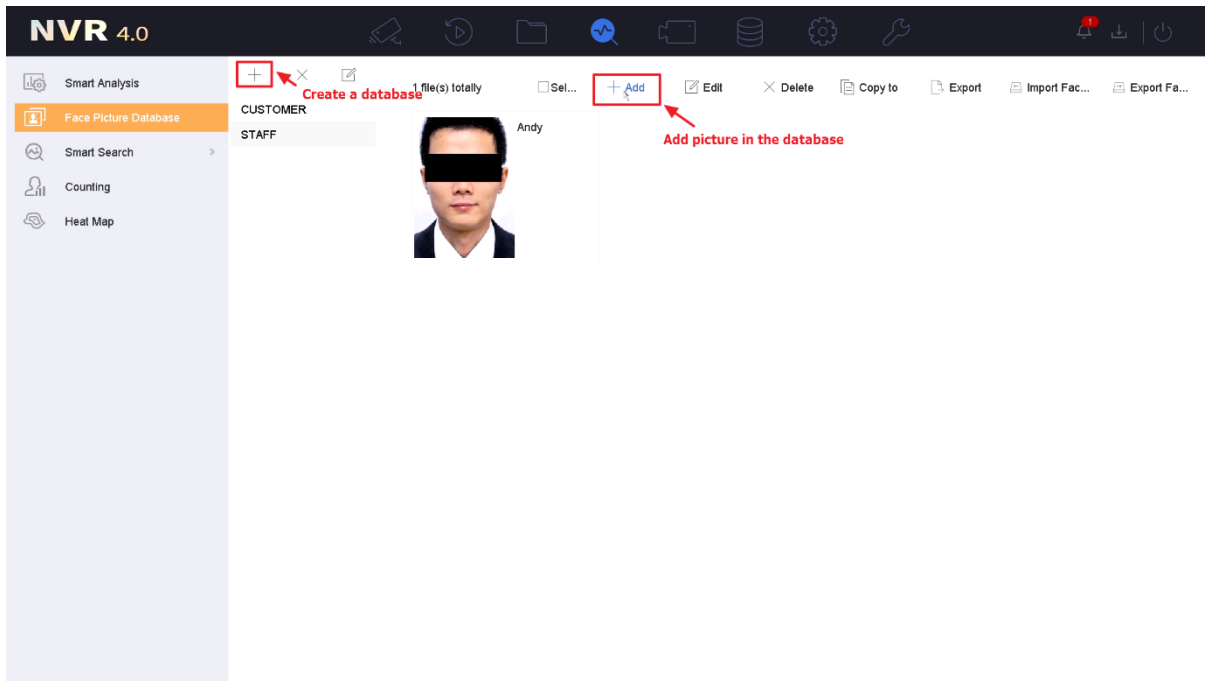

2. Operation

2.1 Create database

Go to NVR's local GUI, **Smart Analysis—Face Picture Database**, create database and add face pictures in the database(The database also can be created via web or iVMS). iDS-77xxNXI-I4/(16P)/X(B) can support 16 face libraries in database and each library can support up to 100000 pictures. Here are the requirements for face picture in database:
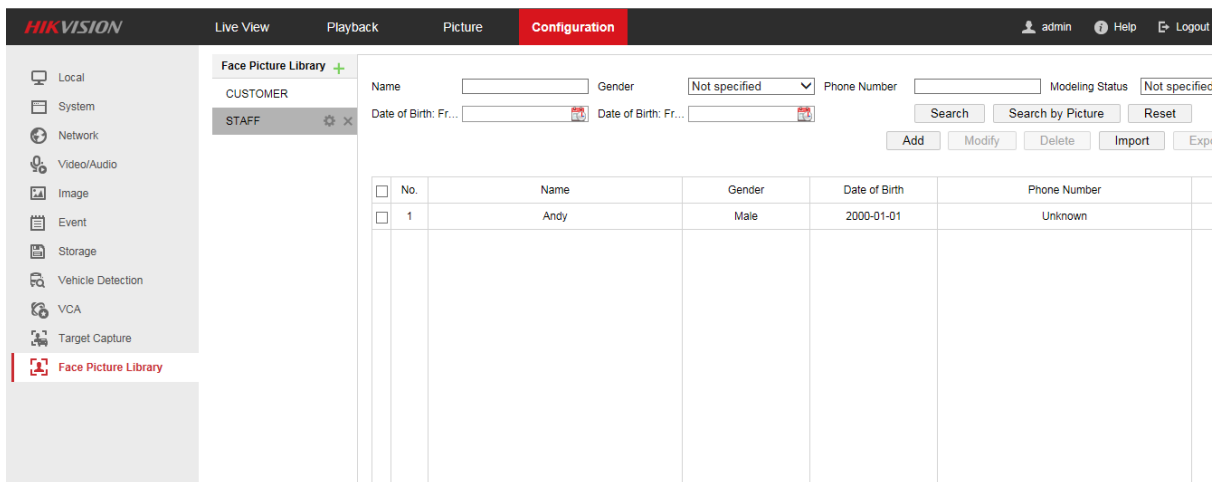
40 <Min. Pupil Distance <300 (recommend 60) pixels.

20KB <Photo Size<4MB

Format: JPG, JPEG

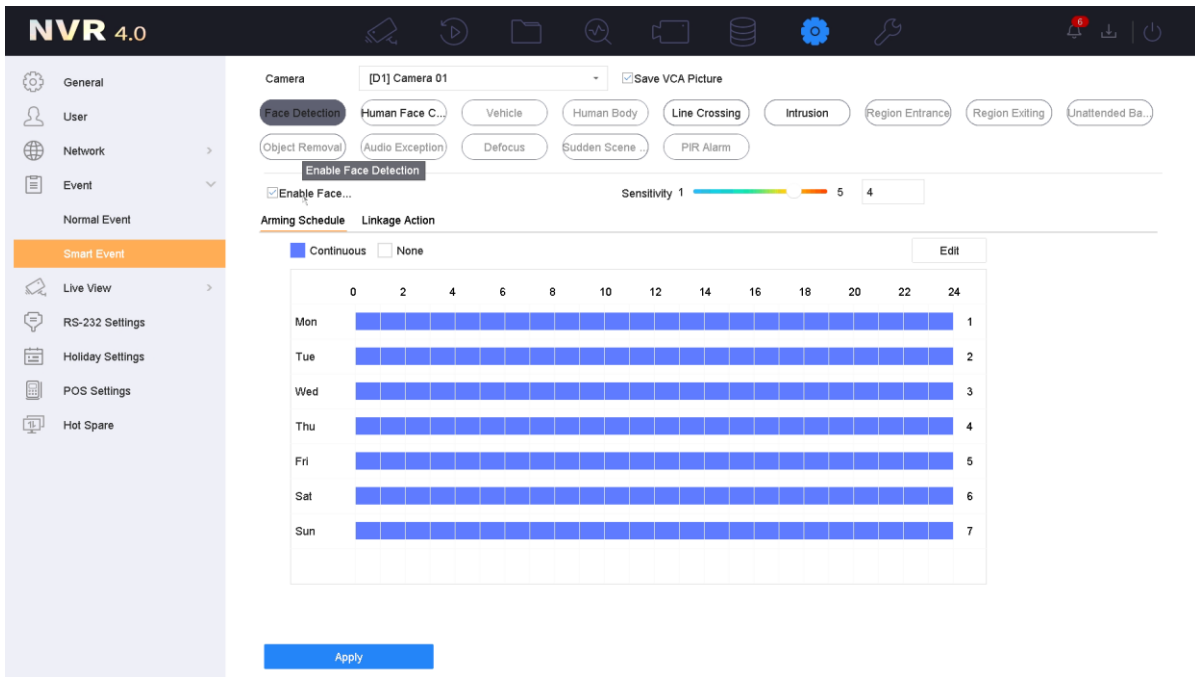Create database via local GUI

Create database via web

Notes:

1) Insert the USB drive that contains the face pictures to create database via local GUI. You can select one picture in USB drive to add or a file that contains multiple pictures to import pictures in batch.

2) The local GUI don't support custom tags except name and phone number for database. You can add custom tags for database via web or iVMS.
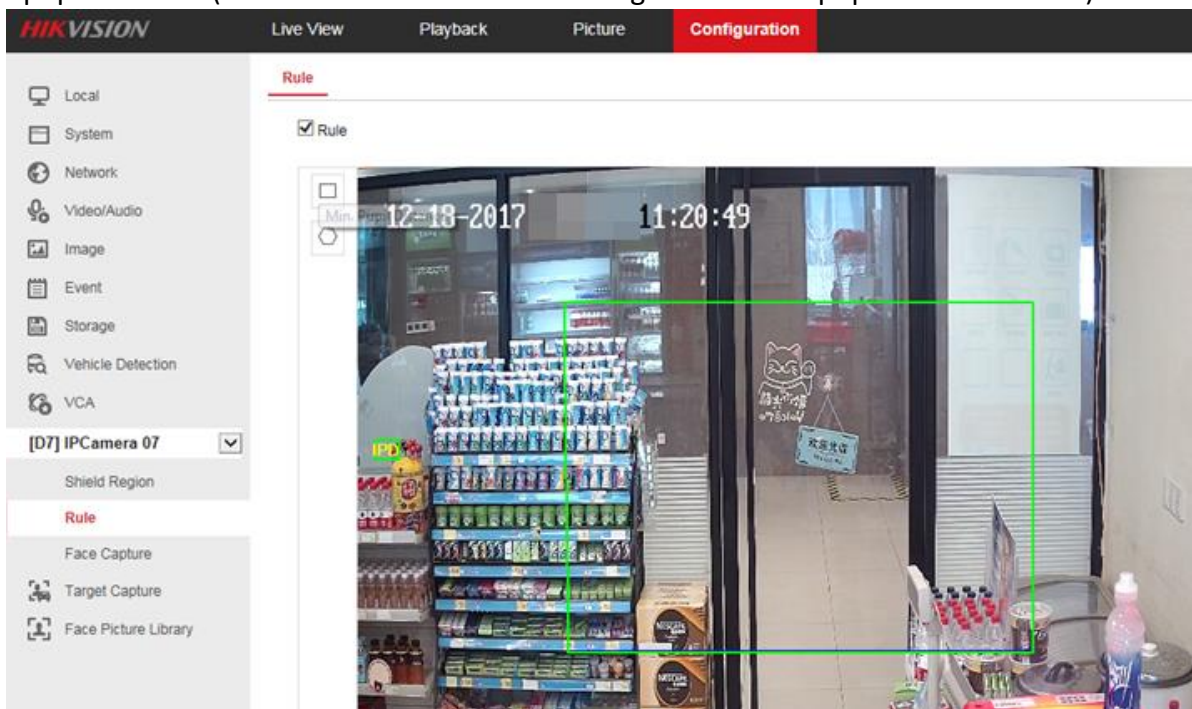
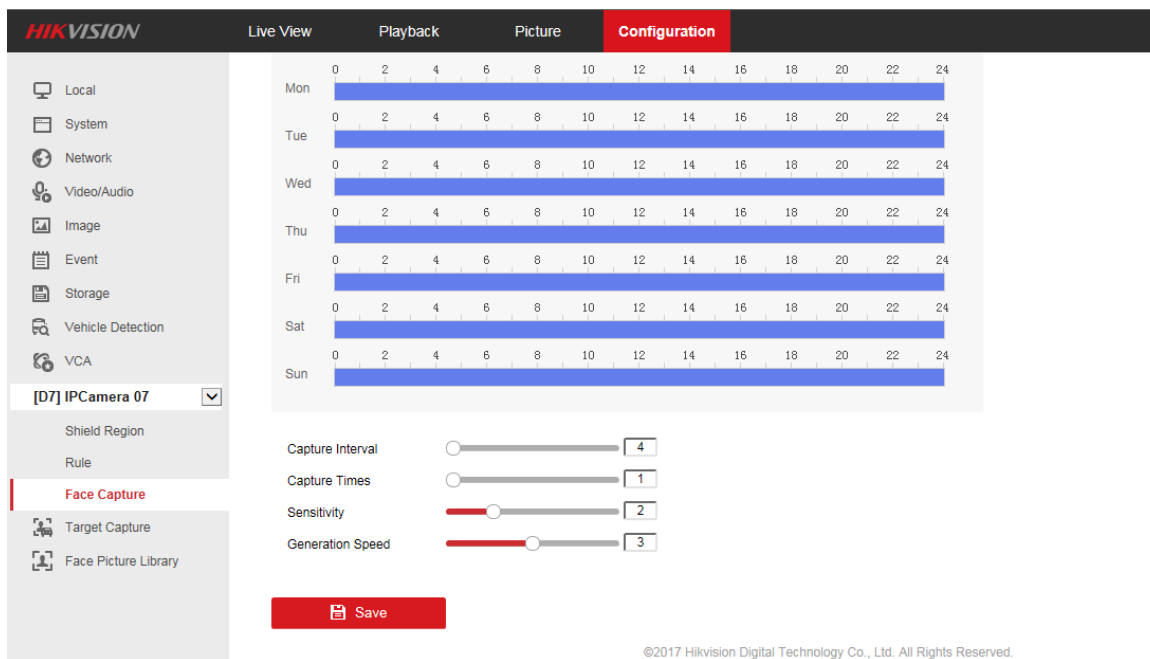3) The picture added to the database should has only one face.

2.2 Configure face capture

Go to NVR's local GUI, **System—Event—Smart Event—Face detection**, tick **'Enable Face Detection'** and NVR will detect and capture face by itself.

Go to NVR's web page, **Configuration—VCA—Rule,** tick **'Rule'** and draw the detection area and min. pupil distance (there will be recommended range of the min. pupil distance below).
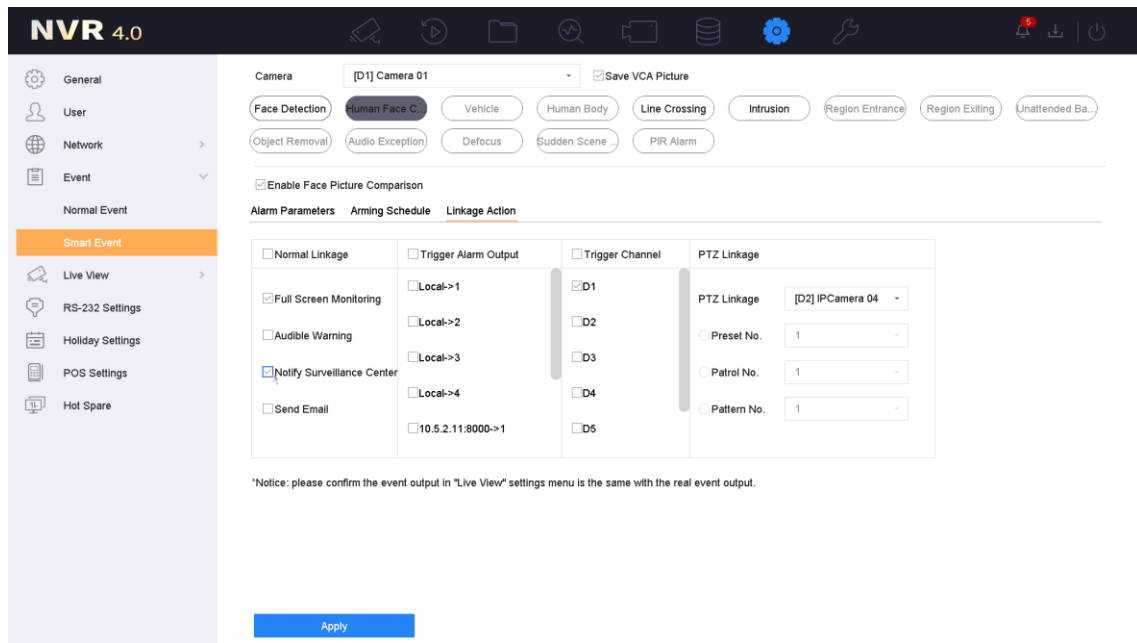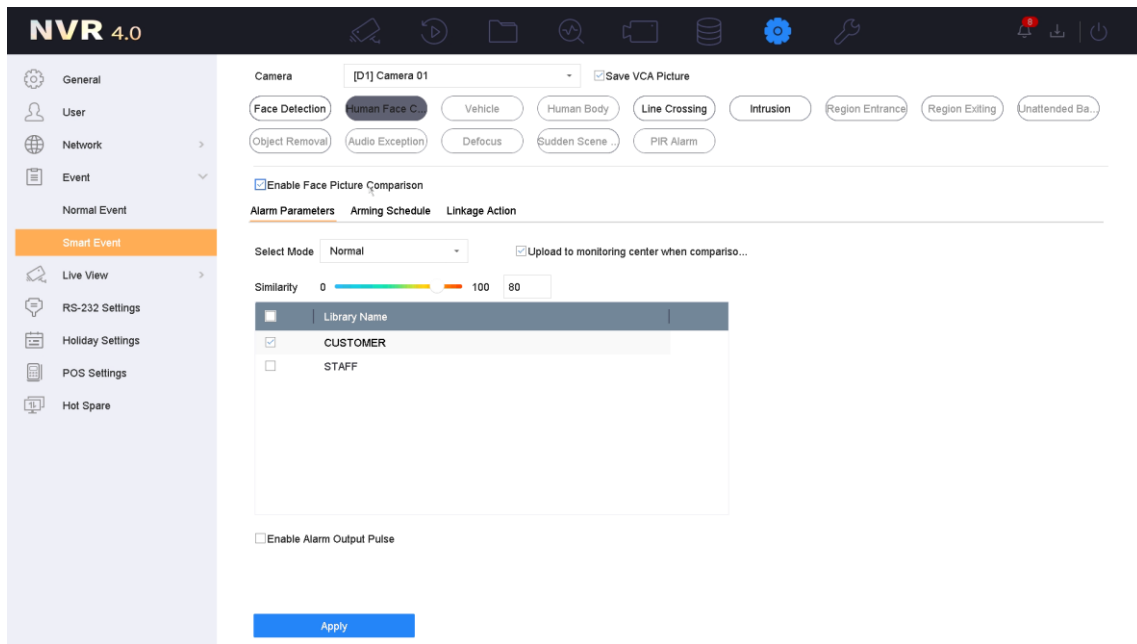
Notes:
1) **Capture Interval**: Capture are taken every few frames, in which the captured images are the highest quality images in each of these frames.
2) **Capture Times**: To control the number of face capture during the people entering the detection area and leaving the detection area.
3) **Sensitivity**: The higher the sensitivity, the easier it is to detect faces.
4) **Generation Speed**: Target generation speed is used to control the speed of the target generated by the human face entering the detection area. The larger the value, the faster the target is generated.
5) For face capture camera, the face detection can't be enabled and the NVR will receive the face image captured by camera by default.
6) NVR can capture face for IP camera with max resolution 4MP.
7) NVR supports 8-ch face capture.

2.3 Configure face comparison

Go to NVR's local GUI, **System—Event—Smart Event—Human Face Comparison**, tick **'Enable Face Picture Comparison'** and select library that you want to compare with. Then set a value for similarity and select mode. There are two modes: **Normal** and **Stranger Comparison**. When the **Normal** mode is selected, only when the similarity between capture face and face in library is higher than the **Similarity** you set, the **Human Face Comparison** alarm will be triggered. When the **Stranger Comparison** mode is selected, only when the similarity between capture face and face in library is lower than the **Similarity** you set, the **Human Face Comparison** alarm will be triggered.
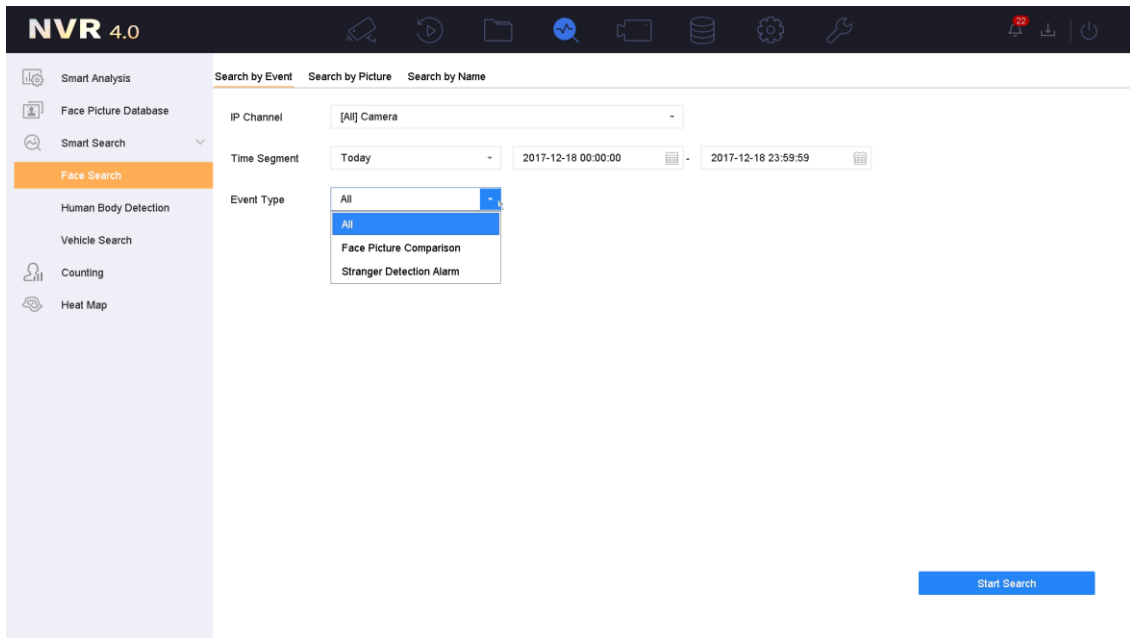

Notes:

1) When the selected mode is **Normal**, the '**Upload to monitoring center when comparison failed** 'can be ticked to upload the capture face to surveillance center as well when the similarity between capture face and face in library is lower than the **Similarity** you set.

2) **Enable Alarm Output Pulse**: The time of alarm output pulse can be configured to control the alarm device better.

3) **NVR can analyze up to 16 pictures per second**, if more than 16 face pictures uploaded in 1 second, the rest of pictures will be saved in buffer, and alarm might be delayed.
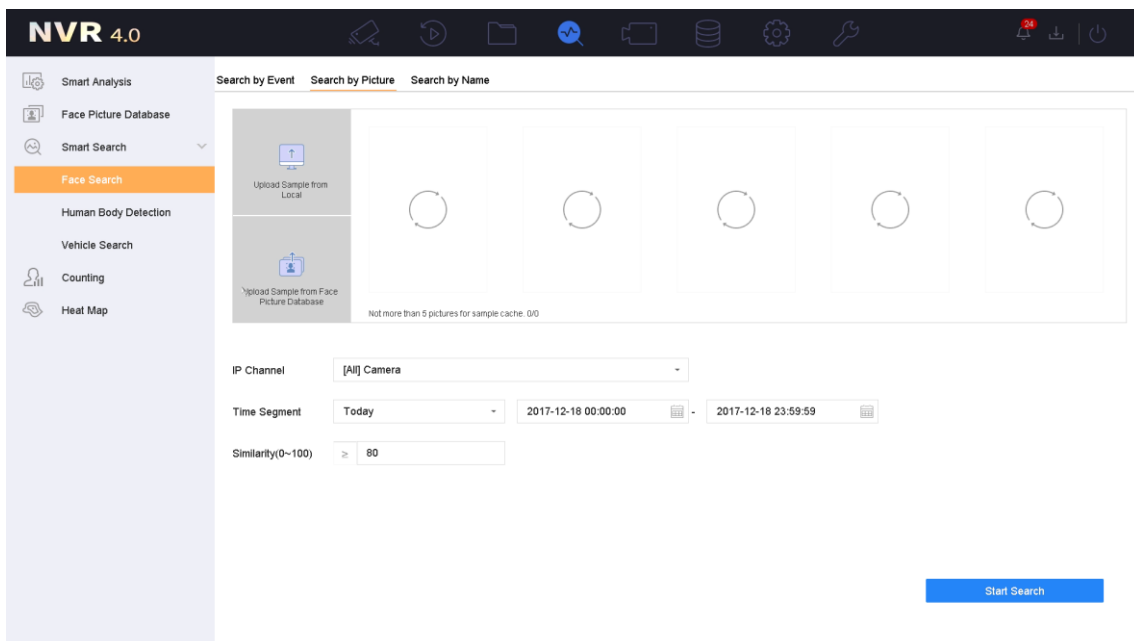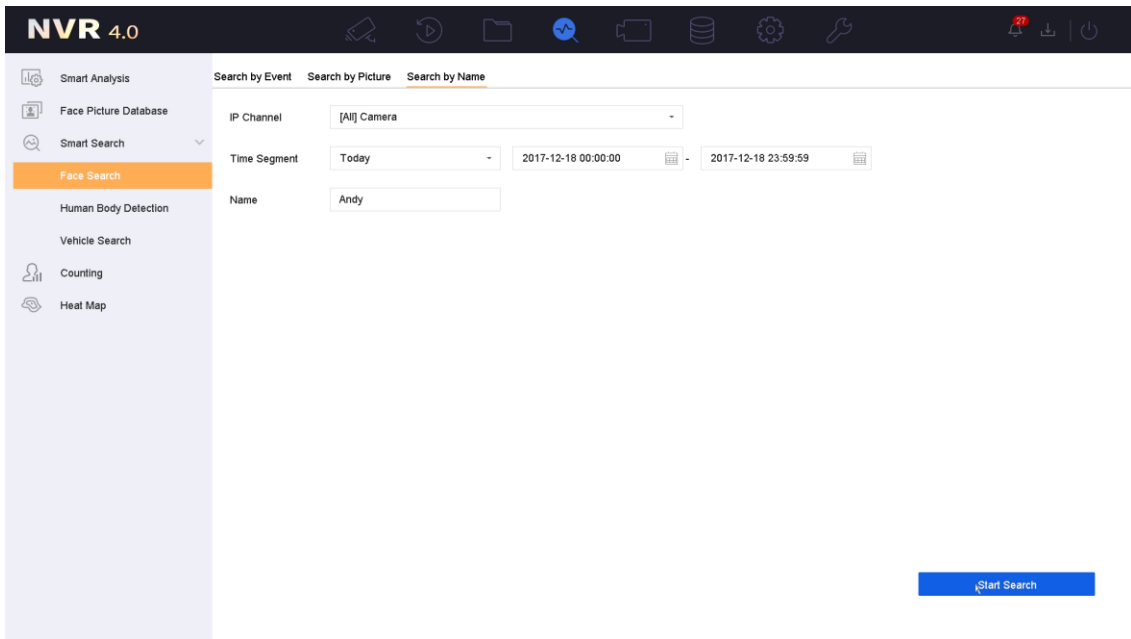
2.4 Search capture face

Go to NVR's local GUI, **Smart Analysis—Smart Search—Face Search,** there are three kinds of face search: **Search by Event**, **Search by Picture** and **Search by Name. In Search by Event,** you can search the capture face by the type of the alarm mode.
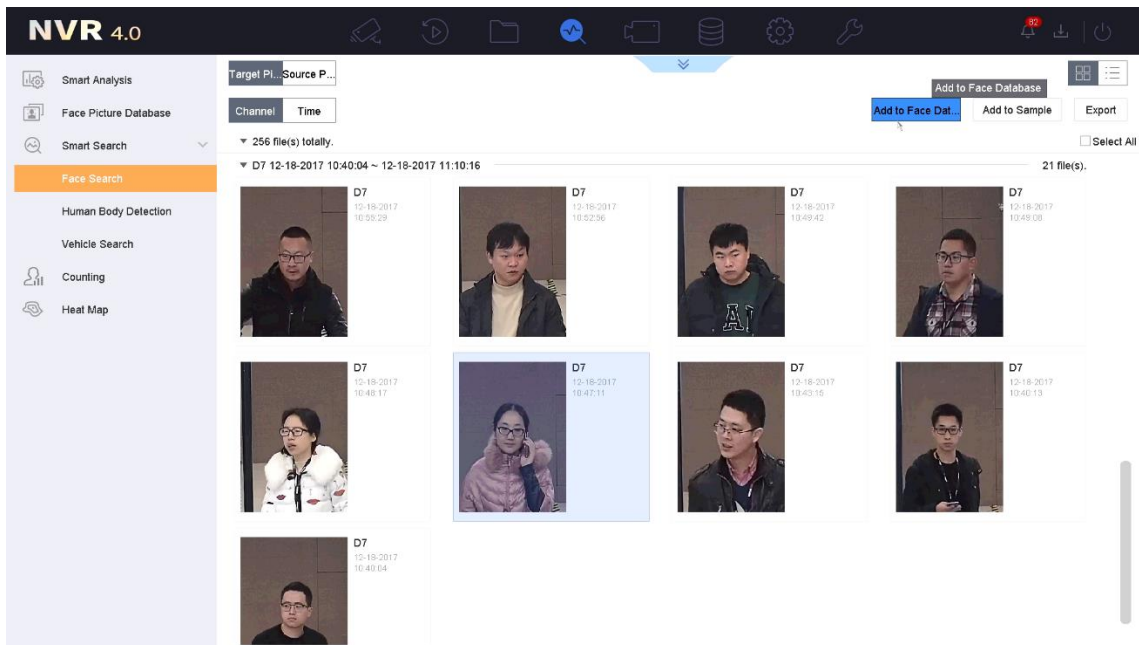

In **Search by Picture,** you can search the capture face by the pictures (When you upload several pictures, the search results are the combination of these several people) that you upload from local or **Face Picture Database**.

In **Search by Name,** you can search the capture face by the name in **Face Picture Database**.

You can select face picture in the **Face Search** result and add the selected face picture to **Face Picture Database** directly.
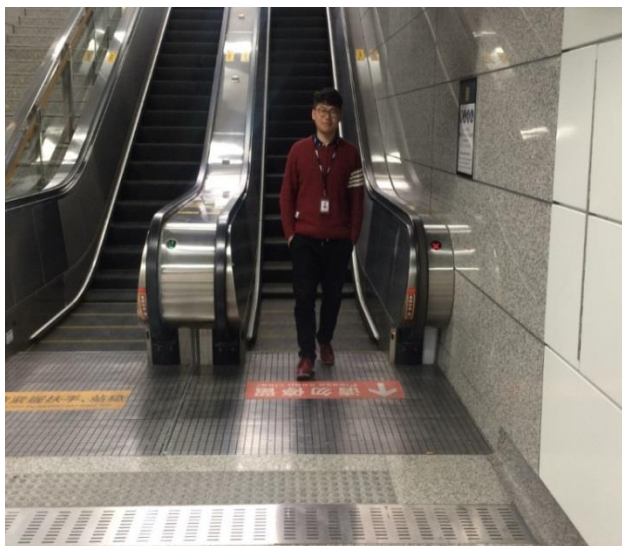

3. Installation specification

3.1 Installation

The accuracy rate of face recognition is great involved with installation location, ambient light (such as too dark, too bright) and so on. In order to ensure the better effect, it raises some installation suggestions as follows:

1) Installation position should be the standard passageways or the Entrances/ Exits, which insures the direction of traffic is particular and capture the Enter/Leave personnel' faces in the direction.
2) Choose the stable lighting condition with adequate illumination. Light compensation is necessary to ensure the facial features are visible under the condition of insufficient light or backlight.
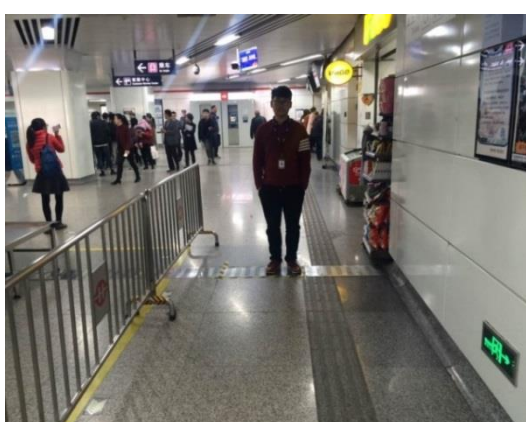
Example of standard scenario:

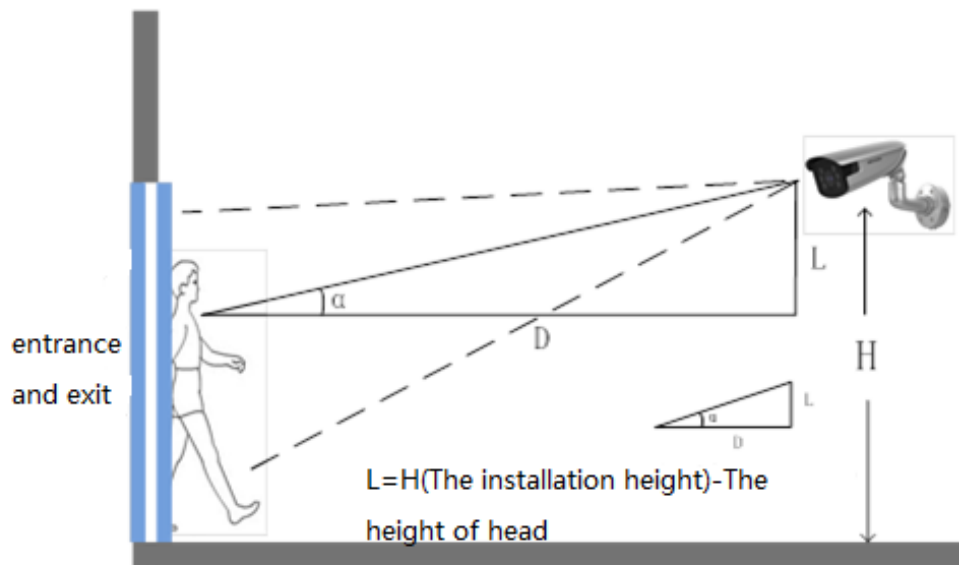**Example of unsuitable scenario:**

Backlight   Lack of light
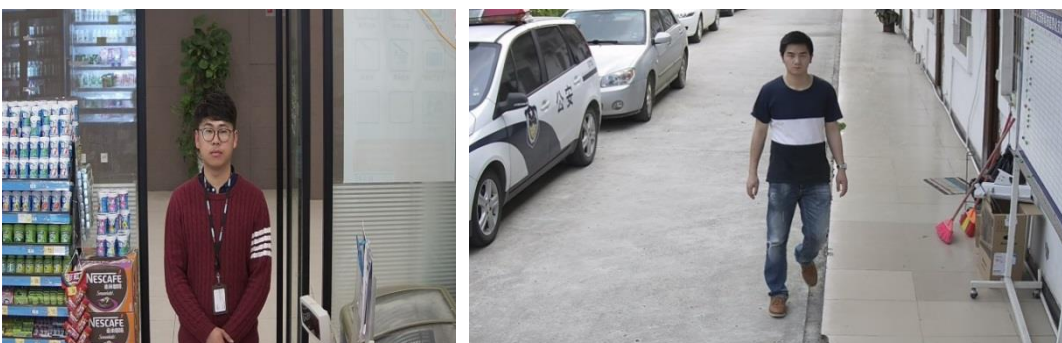
3.2 The Installation Requirement of Camera

The installation diagram

The installation position selection specification of face capture camera is as follows:
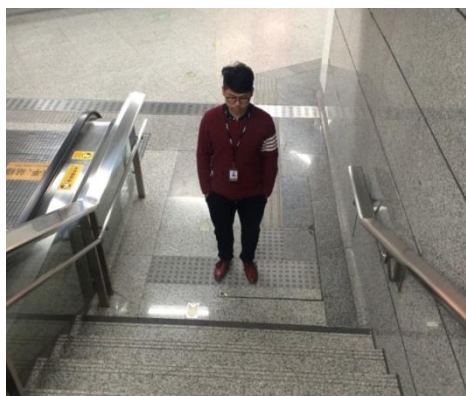
1) The camera should be installed in the front of passageway and capture the positive face. The horizontal angle of deflection had better be less than 25 °.

2) The installation of camera needs an elevation angle, which avoids the situation that the rear face is obscured when the tandem persons go through the passageway. The vertically elevation angle should meet the below requirement: α=15±5°.

3) It requires that the covered PD (Pupil Distance) pixels needs to be larger than 40 pixels to distinguish the face details from the captured image. The practical width of face detection should be less than or equal to 3 meters with 2MP camera.

4) Make sure that there is no shelter between the camera lens and the passageway.

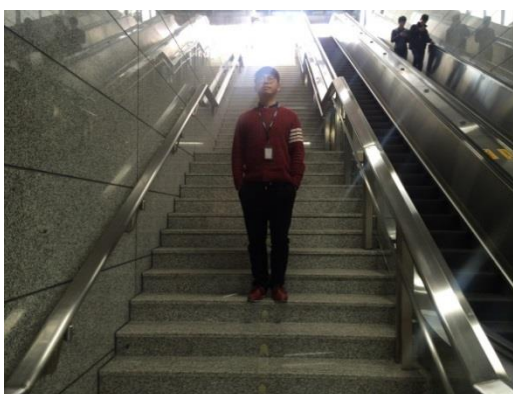**Example of standard scenario:**

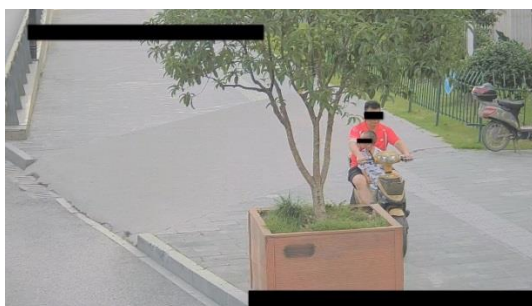

Example of unsuitable scenario:

Dip Angle is too large

Elevation Capture

The scenario is too wide

Incline installation, with shelter

The scenario is too large and the face recognition rate is low

3.3 The Selection of Camera Lens

Different cameras, lens focal lengths and monitoring widths are key points for the different monitoring distance and installation. The conversion relation between them is as follows:

1) The selection of lens focal length：$\mathrm{f} = 1.8D$　　　8426　　　　　(1)

2) The height of camera：$$H = \tan(\alpha°) \times D + 1.5$$　　(2)

3) D : The monitoring distance

4) The height below the head sets as average value 1.5 m

5) α is the elevation angle

6) Elevation angle is recommended as $10°$, $\tan(10°) \approx 0.18$, $\tan(15°) \approx 0.27$, $\tan(20°) \approx 0.36$

3.4 Installation Position and Lens Query Table

Camera Model	Monitoring Width W	Lens Focal Length	Monitoring Distance	Installation Height of Camera	Elevation angle α °
200W	3.0m	4mm	2.2m	1.9m-2.3m	15°±5°
200W	3.0m	8mm	4.4m	2.3m-3.1m	15°±5°
200W	3.0m	16mm	8.9m	3.1m-4.7m	15°±5°

Here're several modes we recommend for outdoor/indoor use, customer can also select by themselves according to actual scenario.

IP camera	indoor	outdoor
7 series	DS-2CD7126G0-IZS DS-2CD7026G0-IZS	DS-2CD7A26G0-IZS
8 & 9 series	iDS-2CD8426G0/F-I	iDS-2PT9122IX-D/F

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