

DHI-IVS-IP8000-A

Prisoner Behavior Detection Server



- Adopt ASIC intelligent computing card researched and developed by Dahua, with low power consumption and high performance.
- Adopt advanced structured + behavior analysis deep learning algorithm, and reach the world-class target detection rate and behavior analysis accuracy.
- Support dynamic loading of algorithm and chip-level separation to enhance system robustness.
- Adopt universal server with PCIE slot design, make use of old servers to reduce costs.
- Based on video cloud architecture, support standalone and clustered deployment, and meet customers' requirements to expand capacity.
- The all-in-one device includes client, and can be sold separately. Connect third-party devices.



System Overview

Based on Dahua Video Cloud Architecture, this prisoner behavior detection server adopts self-developed AI analysis card, and integrates traditional algorithm with deep learning algorithm.

This server is connected to real-time video streams of cameras, configures intelligent analysis rules, and sends alarms and analysis data about abnormal events, including tripwire, intrusion, climbing, get-up, stay, leave post, fighting, audio abnormality, single person and crowd gathering detection.

By integrating multiple intelligent algorithms, this server supports large-scale scenes, mainly including detention centers, prisons, interrogation rooms and their enclosing walls.

Functions

Tripwire

1. Warning line can be in any forms.
2. Regarding every warning line, designate illegal crossing directions (unidirectional or bidirectional).
3. Set 10 independent warning lines in one scene (and configure 10 intelligent rules).
4. Set target triggering position (including the upper, lower, left and right lines, and center. It is the target center by default).
5. An alarm is triggered when the target crosses the warning line.
6. Recognize police uniforms, enable or disable intelligent configuration, and select to send alarms by the client.

Intrusion

1. Set polygonal warning areas (Note: Dahua protocol defines that a polygon has maximum 20 edges).
2. Set 10 independent warning areas in one scene.
3. Regarding every warning area, detect "cross area" and/or "in area" behaviors.
4. During "in area" detection, set target quantity, the minimum duration and repeated alarm interval.
5. During "cross area" detection, the crossing direction can be entry, leaving or bidirectional.
6. An alarm is triggered when the target enters or leaves the warning area.
7. Recognize police uniforms, enable or disable intelligent configuration, and select to send alarms by the client.

Climbing Detection

1. Warning line can be in any forms (Note: Dahua protocol defines that the line has maximum 20 points).
2. Set 10 independent warning lines in one scene.
3. An alarm is triggered when the body below the head crosses the height warning line.

Get up Detection

1. Set a get up detection area with four edges.
2. Regarding every detection area, set alarm trigger line and sleep direction line (from head to feet).
3. Set 10 independent warning areas in one scene.

4. Scene requirement: The bed is perpendicular to camera monitoring direction.
5. Support one-layer sleep quarters, rather than bunk bed.
6. An alarm is triggered when the target gets up within the armed period (applicable to sleeping time).

Stay Detection

1. Set polygonal areas (Note: Dahua protocol defines that a polygon has maximum 20 edges).
2. Set 10 independent areas in one scene.
3. Set alarm duration and repeated alarm interval. Alarm duration: 1–600 seconds; alarm interval: 1–600 seconds.
4. An alarm is triggered when a person stays (loiters) in the stipulated area longer than the configured duration.
5. The arm time can be 6 different periods each day from Monday to Sunday.

Leave Post

1. Set polygonal areas (Note: Dahua protocol defines that a polygon has maximum 20 edges).
2. Set 10 independent areas in one scene.
3. Set minimum alarm duration and alarm interval. Alarm duration: 1–3,600 seconds; alarm interval: 1–3,600 seconds.
4. Select no person, leave post, sleeping while on duty and duty people number exception. Configure the minimum and maximum people numbers to detect the duty of one person and two persons. For example, when minimum number is 1 and maximum number is 1, an alarm is triggered when there is no person or there are more than 1 person. When minimum number is 2 and maximum number is 2, an alarm is triggered when the number is less than 2 or more than 2.
5. An alarm is triggered when someone is sleeping while on duty. (Note: If someone does not act or move in the detection area within the set period, an alarm is triggered and the specific person is found.)
6. The arm time can be 6 different periods everyday from Monday to Sunday.

Audio Abnormity Detection

1. After audio abnormity detection rule is configured, the client displays the sound intensity dB value in real-time.
2. Set the audio abnormity alarm threshold (dB value), and minimum alarm duration.
3. An alarm is triggered when the sound intensity exceeds the set value (1 dB–150 dB) and exceeds the minimum duration (0–30 seconds). (Configure 1 audio alarm rule for 1 channel.)
4. The arm time can be 6 different periods everyday from Monday to Sunday.

Fighting Detection

1. Set polygonal areas (One video channel can only set 1 area and configure 1 fighting rule.) (Note: Dahua protocol defines that a polygon has maximum 20 edges).
2. The 1U server only supports 8-channel fighting detection and analysis (Fighting and other rules can be overlaid).
3. Set detection sensitivity from 1 to 10.

Single Person Detection

1. Set polygonal warning areas (Note: Dahua protocol defines that a polygon has maximum 20 edges).
2. Set 10 independent warning areas in one scene.
3. Single person alarm can be triggered in every warning area (there is no alarm when there are more than 1 person or there is no person).

Gathering Detection

1. An alarm is triggered when the detected gathering exceeds the set period.
2. Set polygonal areas.
3. Set sensitivity.

Video Channel Management

1. Support the connection analysis of Dahua, Hikvision, GB28181 and ONVIF network cameras and network video recorders.
2. Support the connection analysis of H.264 and H.265 network cameras and network video recorders.
3. Acquire streams from RTSP platform, and make connection analysis.

Platform Supporting Functions

1. Connect to DSS platform through NetSDK protocol, and upload the alarm information to the platform.
2. The platform can acquire smart streams from IP8000 through NetSDK protocol.

Application

This server mainly applies to indoor and outdoor scenes, mainly including detention centers, prisons, interrogation rooms and their enclosing walls.

Technical Specification	
System	
Main processor	One Intel Xeon E3-1275 V5, 3.6 GHz, 4C/8T
Chip	Intel C236
Intelligent card	One Dahua DH-AIX3000 self-researched standard half-height intelligent card
Operating system	CentOS Linux release 7.4.1708 (Core)
Memory	Two 8GB DDR4 memory, maximum 4 slots.
HDD	One 3.5" 4T HDD which can be extended to maximum 16T (each HDD is 4T), and maximum 4 slots. 7.2K RPM SATA 6Gbps 512n 3.5"
Prison IVS analysis	
Alarm search	Search alarm information by period, monitoring location, and alarm type.
Tripwire	An alarm is triggered when someone crosses the warning line. Warning line can be in any forms. Regarding every warning line, designate illegal crossing directions (unidirectional or bidirectional). Set multiple independent warning lines in one scene. Filter the size of targets that cross the warning line. Set the triggering location. Recognize police uniforms, enable or disable intelligent configuration, and select to send alarms by the client.
Single person detection	Set polygonal warning areas. Set 10 independent warning areas in one scene. Single person alarm can be triggered in every warning area (there is no alarm when there are more than 1 person or there is no person).
Intrusion	An alarm is triggered when someone enters the warning area. Set polygonal warning areas. Set multiple independent warning areas in one scene. Regarding every warning area, detect "cross area" and/or "in area" behaviors. During "in area" detection, set target quantity, the minimum alarm duration and repeated alarm interval. During "cross area" detection, the crossing direction can be entry, leaving or bidirectional. Recognize police uniforms, enable or disable intelligent configuration, and select to send alarms by the client.
Climbing detection	An alarm is triggered when someone crosses the height warning line. Warning line can be in any forms. Set multiple independent warning lines in one scene. Filter the size of targets that cross the warning line.
Get up detection	An alarm is triggered when the target gets up within the armed period. Set a get up detection area with four edges. Regarding every detection area, set alarm trigger line and sleep direction line. Set multiple independent warning areas in one scene. Filter the size of targets that get up. Set the bed direction. Support one-layer sleep quarters, rather than bunk bed.
Staying (loitering) detection	An alarm is triggered when someone stays in the area exceeding the stipulated period. Set polygonal areas. Set multiple independent warning lines in one scene. Set the minimum alarm duration and repeated alarm interval. Filter the size of targets that intrude the area.

Leave post detection	An alarm is triggered when someone leaves the stipulated area (when one person or two persons on duty), or sleeps during duty. Set polygonal areas. Set multiple independent warning areas in one scene. Set the minimum alarm duration and report interval.
Fighting detection	An alarm is triggered when fighting event is detected automatically. Set polygonal areas. At present, only one area can be set. For each area, select one mode from "Audio Detection Mode", "Video Detection Mode" and "Audio and Video Detection". Set sensitivity.
Gathering detection	An alarm is triggered when the detected gathering exceeds the set period. Set polygonal areas. Set sensitivity.
Audio abnormality detection	Detect abnormal audio in the channel automatically. Set sound intensity. Set the minimum alarm duration.

Prison IVS Analysis Performance

Single person detection rate	Recall rate ≥90% (Correct alarms/real events) Effective rate ≥90% (Correct alarms/total event alarms)
Camera access	One server supports the access analysis of maximum 16-channel 1080P cameras (it supports 8-channel fighting detection).
Climbing detection rate	Recall rate ≥90% (Correct alarms/real events) Effective rate ≥90% (Correct alarms/total event alarms)
Getting up detection rate	Recall rate ≥80% (Correct alarms/real events) Effective rate ≥80% (Correct alarms/total event alarms)
Staying (loitering) detection rate	Recall rate ≥90% (Correct alarms/real events) Effective rate ≥90% (Correct alarms/total event alarms)
Leave post detection rate	Recall rate ≥85% (Correct alarms/real events) Effective rate ≥85% (Correct alarms/total event alarms)
Fighting detection rate	When the sensitivity is 7: Recall rate ≥80% (Correct alarms/real events) False alarm frequency ≤10 false alarms/24 hours (Target size: The fighting target takes up 1/4 × 1/4 of the whole image).
Tripwire detection rate	Recall rate ≥90% (Correct alarms/real events) Effective rate ≥90% (Correct alarms/total event alarms)
Gathering detection rate	When the sensitivity is 5: Recall rate ≥90% (Correct alarms/real events) Effective rate ≥90% (Correct alarms/total event alarms)
Intrusion detection rate	Recall rate ≥90% (Correct alarms/real events); Effective rate ≥90% (Correct alarms/total event alarms)

Prison IVS Analysis Scene

Scene attribute	It is widely applicable to indoor scenes of prisons and detention centers.
Camera installation	Inclined installation
Camera installation height	3 to 5 m
Camera installation angle	Inclined installation
Resolution	Above 720p

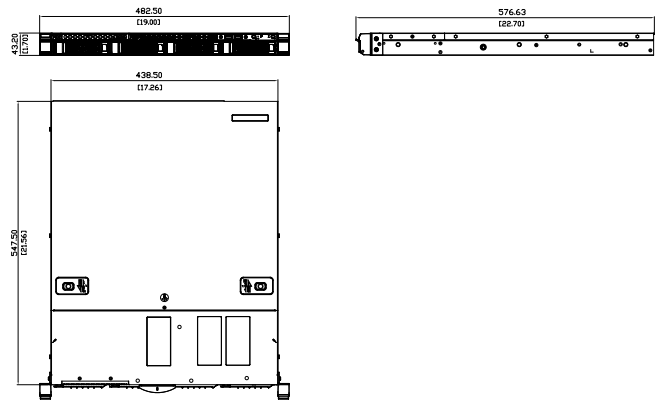
Port

Network	Two 1000M Ethernet port
USB	2 front USB2.0 ports, 2 rear USB3.0 ports and 2 rear USB2.0 ports
VGA	1 VGA port
DVI	1
DP	2

General

Power Supply	100–240V, 50–60Hz, 6A–3A
Power redundancy	Single power supply
Power Consumption	≤ 400W
Operating temperature	10°C to 35°C (50°F to 95°F)
Operating humidity	10%–80% RH (29°C)
Storage temperature	10°C to 65°C (50°F to 149°F)
Storage humidity	5%–95%RH (33°C)
Gross weight	16.00 kg (35.3 lb)
Net weight	8.50 kg (18.7 lb)
Product dimensions	43.50 mm × 438.50 mm × 550.00 mm (1.71" × 17.26" × 21.65") (H × W × D)
Box dimensions	271.00 mm × 625.00 mm × 895.00 mm (10.67" × 24.61" × 35.24") (H × W × D)
Installation	Standard 19" rack installation with guide rail.

Dimensions (mm[inch])



Ordering Information

Type	Model	Description
Prisoner behavior detection server	DHI-IVS-IP8000-A	Prisoner behavior detection server