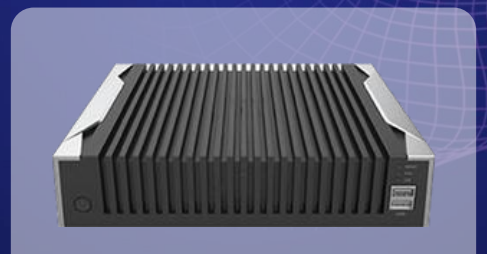
Edge AI Box AI intelligent product introduction



Shenzhen Moocoo Technology Co., LTD

AI edge box overall scheme

Edge computing box

◆ RK3568/3588

Video analysis edge AI box overall solution

1, support more than 100 kinds of visual algorithms flexible configuration

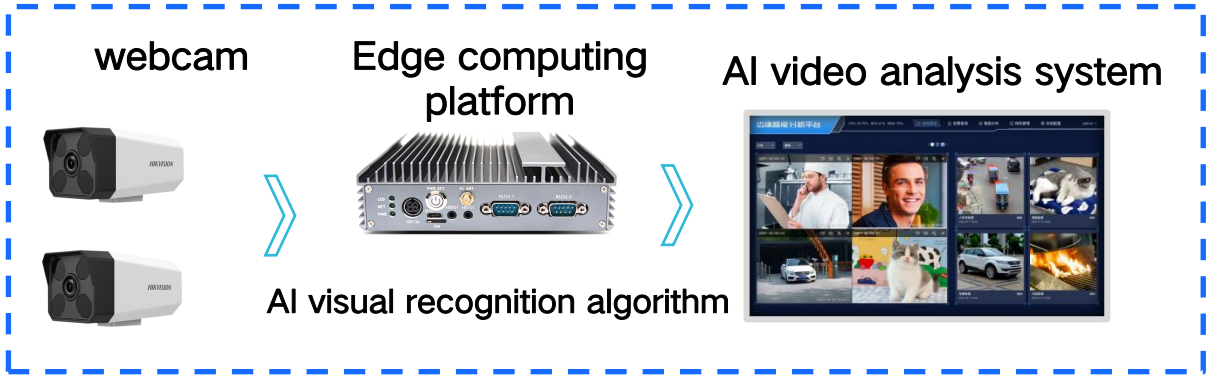
2. Complete API application interface and management operation interface

3, complete Turnkey turnkey overall solution

4. Support end users to take photos according to their own application scenarios and train and upgrade algorithms

Turnkey turnkey complete solution based on the edge AI box of training and pushing

Solution architecture



◆ **Provide Turnkey overall solution**

Video structure + algorithm structure + application layer API interface

◆ **Supports end-user algorithm self-optimization and upgrade**

End users can collect 100 pictures according to their own scenes and optimize and upgrade the algorithm through the integrated platform of training and pushing

Function module

List of smart NVR features			
Function module	Instructions	Function module	Instructions
User management	Identity authentication, multi-role, multi-authority user management, etc	Event reporting management	Take the initiative to report the alarm event to the sub-management platform and push the alarm video
IPC management	IPC search, add/remove, stream parameter setting, etc	Fast search	Support by device, by channel, by time, by event, by target, by attribute, by label and so on to quickly locate the target, and linkage call out the target video
Polling management	Flexible channel rotation training, algorithm distribution strategy	System management	Basic Settings, device status, networking configuration, hard disk management, data backup, import and export
Channel management	Set channel groups, schedule policies for channels in batches, and configure algorithms	Equipment maintenance	Device health detection, network detection, OTA upgrade, restore factory Settings, etc
Algorithm library management	Manage face database, license plate database and other target recognition algorithm database	Multilingual management	Comes with Chinese, English and multiple languages, support any country language pack update
Algorithm subscription	More than 100 algorithms can be flexibly subscribed, and the types and duration of subscription algorithms can be used for any combination of application scenarios.	Deeply customizable	Provide SDK interface, can achieve deep UI customization/skin change
Event video management	Algorithm trigger, host computer instruction, external signal trigger and other event trigger mechanism	Full protocol docking	Support GB28181, 1400 protocols, ISUP, HTTP, MQTT, ONVIF, RTSP, etc

100+ algorithm support

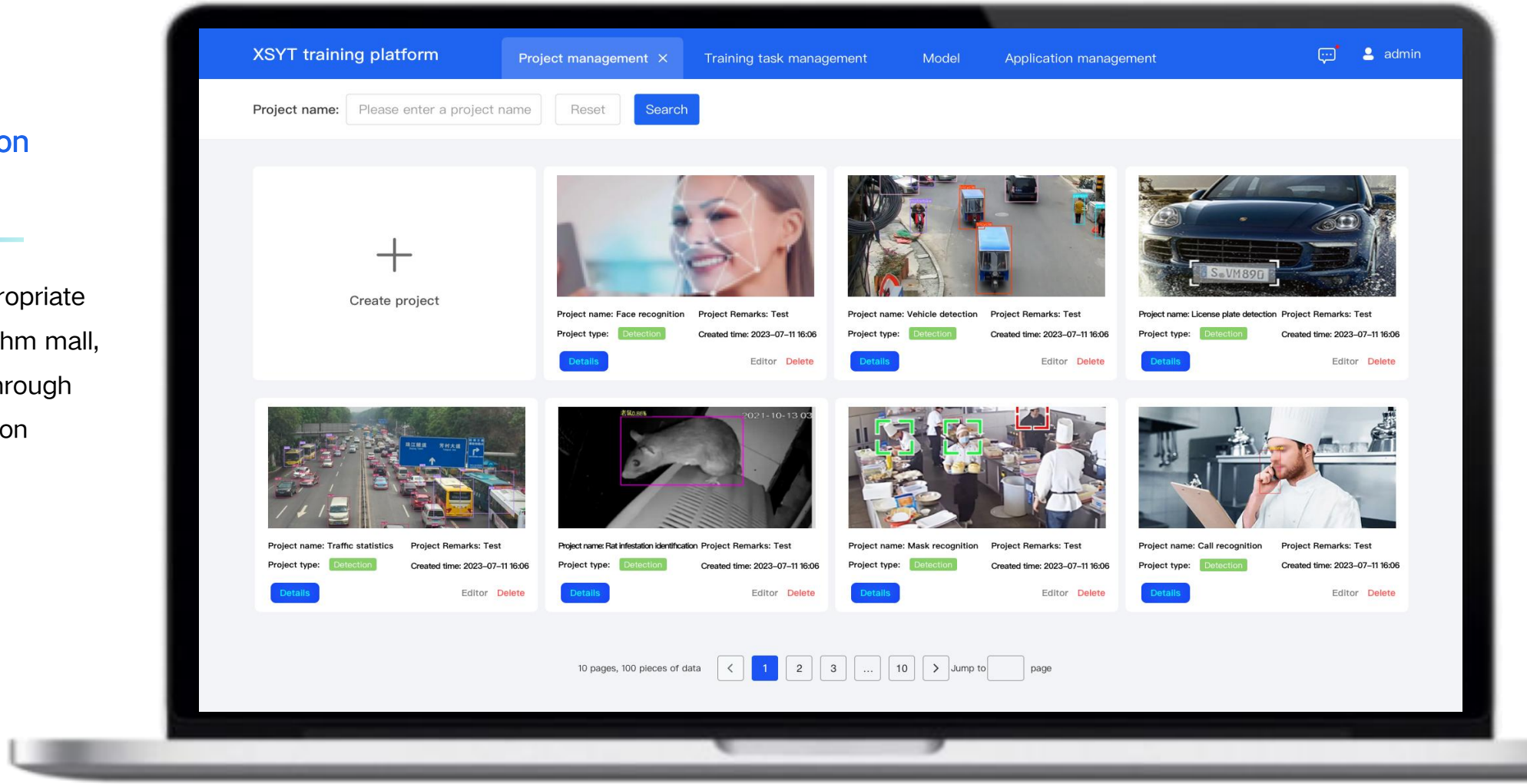
Scene classification	Functional classification	Algorithm name
A bright kitchen and a bright stove	Dress code	Chef hat test, chef mask test, chef clothing test, shirtless,Testing without gloves...
	Site specification	Dustbin uncovered detection, rat detection, night intrusion, open smoke and flame detection
	Operation specification	Play mobile phone test, phone call test, smoking test, fire leave test
Smart park	Total target analysis	Motor vehicle attributes, non-motor vehicle attributes, license plate recognition, face attributes
	Behavior analysis	Wandering identification, leaving the post identification, crowd identification, telephone identification, elevator difficulty identification, smoking identification
	Alert algorithm	Trip wire intrusion, area intrusion, channel blockage, vehicle congestion, illegal parking identification, fireworks detection, electric vehicle detection, garbage detection
General algorithm	Human face	Face recognition, face capture, head detection, human key point detection, pedestrian attribute detection
	Vehicle correlation	License plate recognition, electric vehicle detection, vehicle recognition
	Universal target detection	Flame detection, fall detection, gesture recognition, helmet detection
Urban management	City appearance	Traffic flow monitoring, illegal painting and paste monitoring, passenger flow statistics, electric vehicle helmet identification
	Safety hazard	Human flow statistics, crowd gathering, area intrusion, retention monitoring, road water identification, railings detection, fishing, fishing behavior detection, illegal tent construction detection, shirtless detection, danger identification near water, fighting
	transportation	Vehicle license plate
	Environmental protection	River floating object identification, personnel trespassing in dangerous waters, illegal fishing
	Urban construction	Night construction monitoring, hard hat identification, reflective clothing identification, intelligent identification
	Market supervision	Street business, travel stall vendor identification, blacklist identification, sundry pile identification
	Street community	Manhole cover identification, cat and dog identification, flame identification, high-altitude throwing, electric vehicle identification, fire passage obstacle identification, work clothes identification, fire door opening and closing status identification

According to the user's own use scenario, using the core computing one physical training and pushing platform to generate their own new algorithm...

End users optimize and upgrade algorithms based on their own scenarios

- Visual interface based on algorithm training

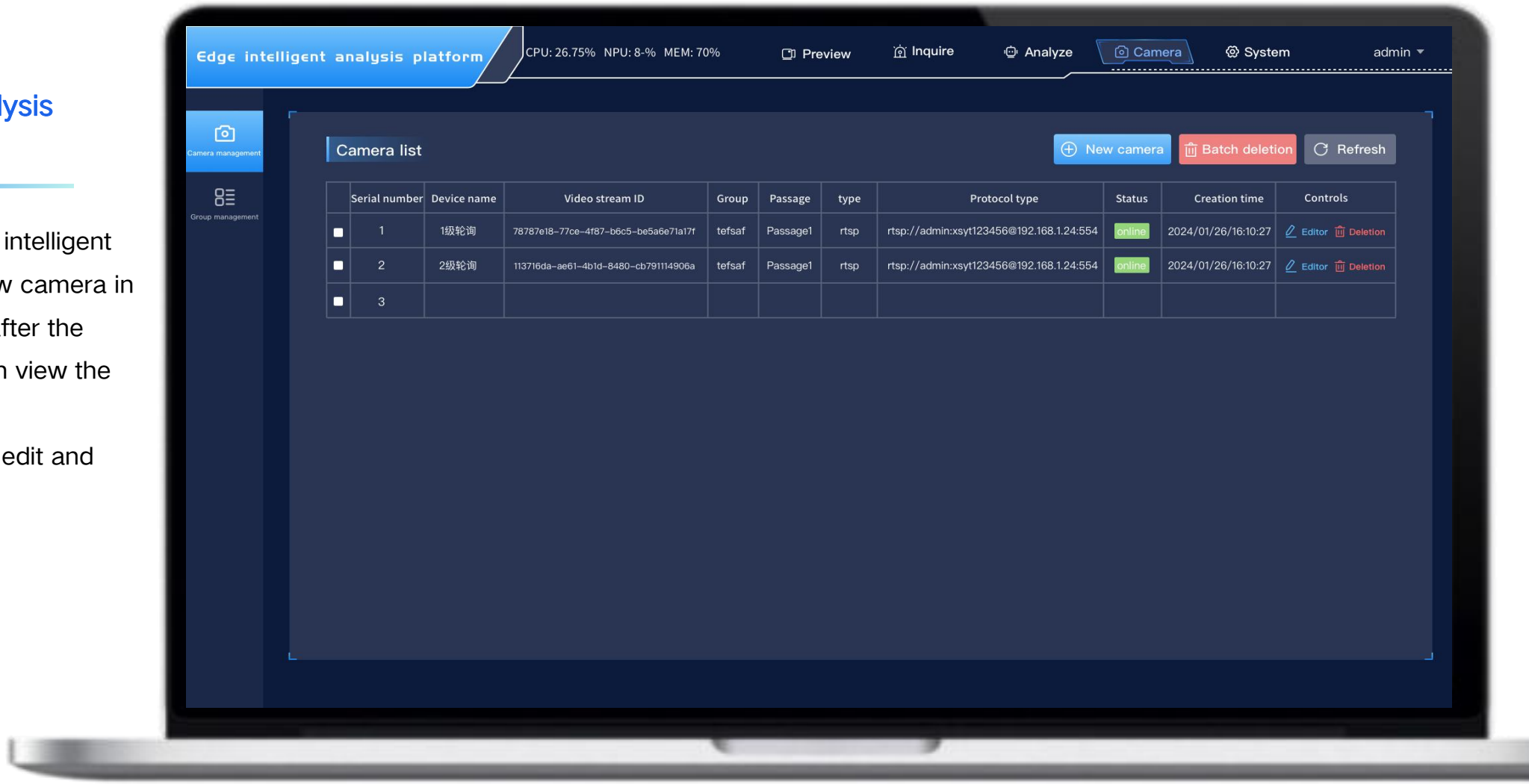
Developers can choose the appropriate algorithm model from the algorithm mall, and quickly train and deploy it through the "training and pushing" function



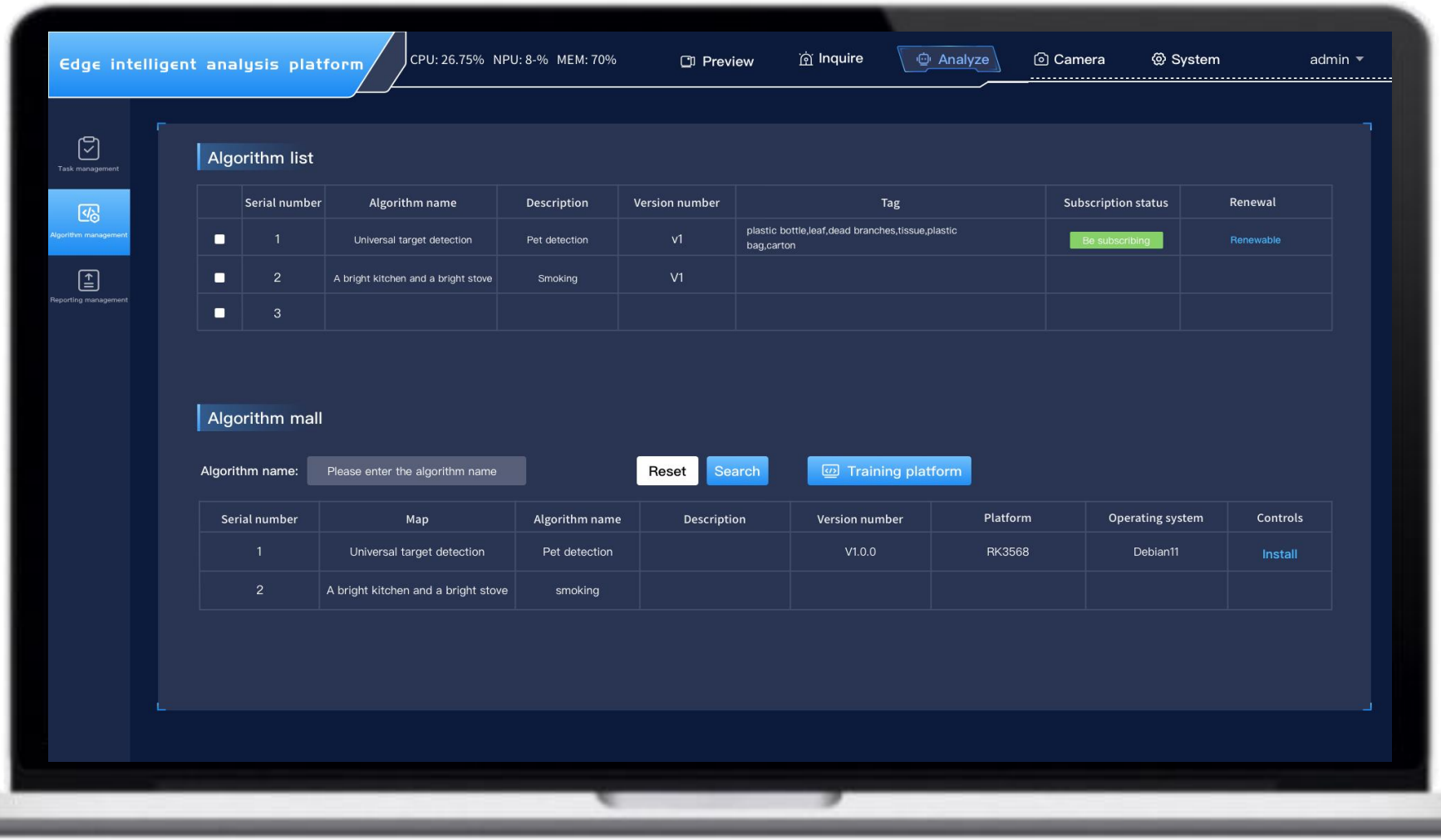
Intelligent analysis management operation interface display

Edge intelligent analysis platform interface

After logging in to the edge intelligent analysis platform, add a new camera in the camera management, after the successful addition, you can view the online status in the camera management, you can also edit and delete.



Intelligent analysis management operation interface display

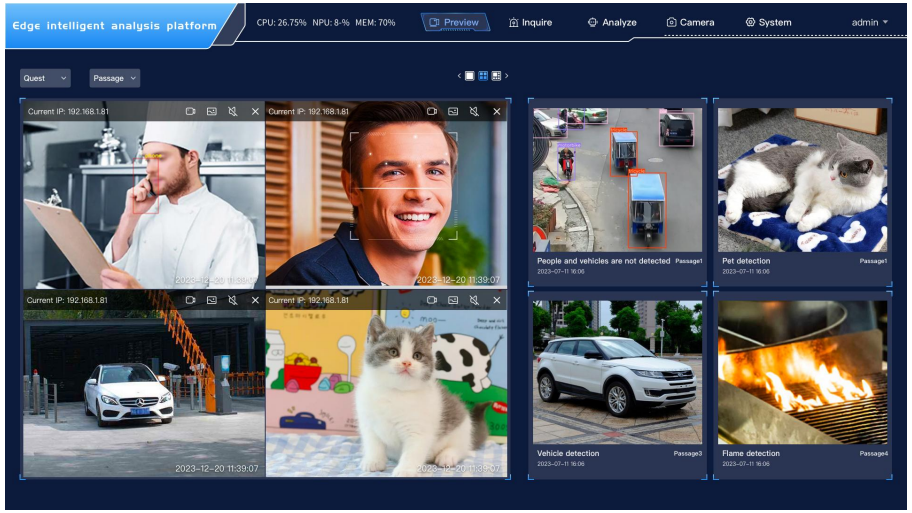


Edge intelligent analysis platform interface

The algorithm list in the Algorithm Management of Intelligent Analysis can view the subscription status and local algorithms.

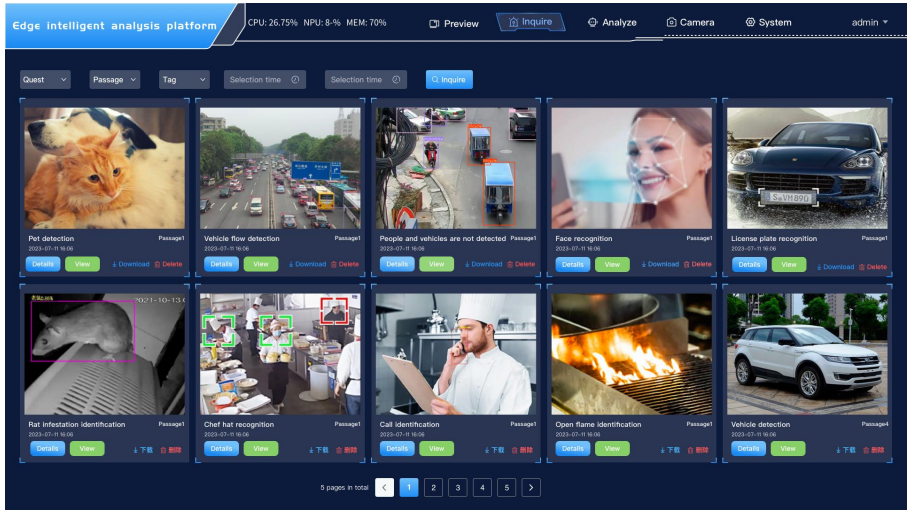
The scene algorithm can search for the local algorithm that needs to be used through the algorithm mall, and it can also train new algorithms through the training platform, and the new algorithms can be downloaded to the local deployment through the training platform.

Intelligent analysis management operation interface display



Edge intelligent analysis platform interface

Real-time preview allows you to view online videos and alarm videos



Edge intelligent analysis platform interface

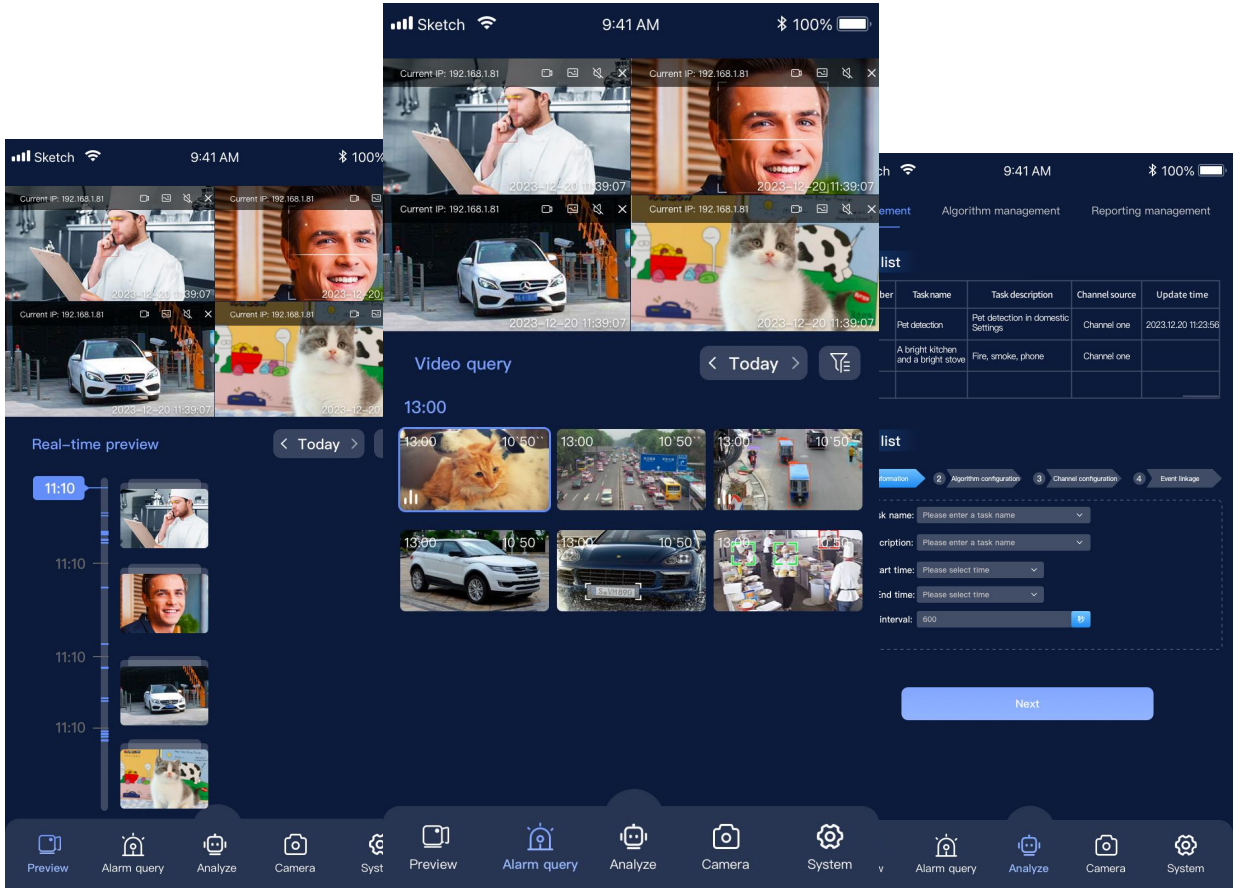
You can query video details by task, channel, alarm label, and filtering time

Mobile app management operation interface

Live preview: View video dynamics in real time

Alarm query: You can view video history details by time filtering

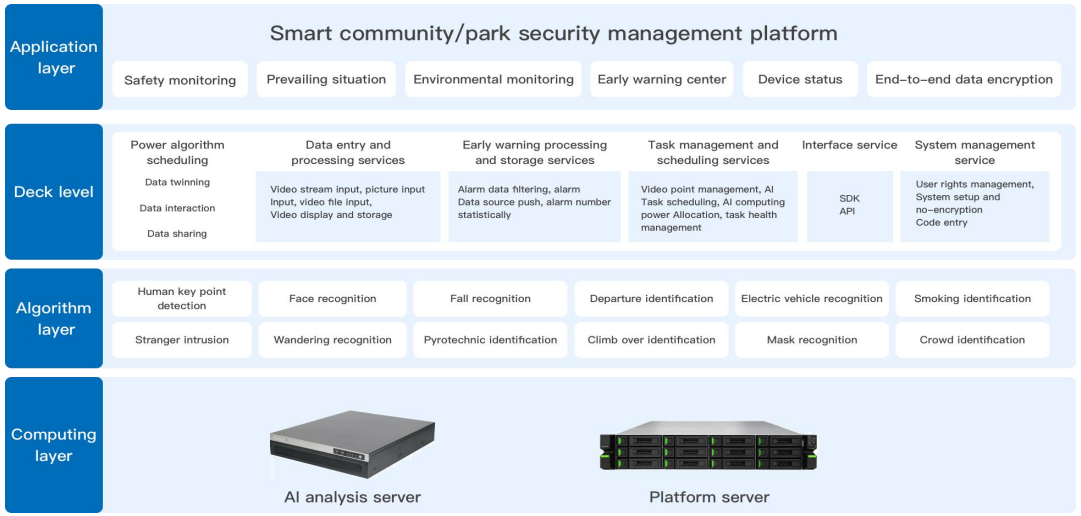
Intelligent analysis: Displays the various algorithms in the algorithm mall and the algorithm usage of the device that has been configured



Application scenario: Smart community, park solution

- **Scheme overview:** The comprehensive security control of intelligent community/park and other areas is based on the edge AI box and combined with the AI vision algorithm automated training platform to provide a safe, comfortable and convenient intelligent life scene for the park. Creating refined community governance solves the problems of co-construction, co-governance, and sharing of park governance, integrating 5G, AI, big data, the Internet, and the Internet of Things, involving many fields such as campus parks, smart communities, and government parks.
- **Algorithm application:** License plate recognition, fall recognition, stranger intrusion, wandering recognition, smoking recognition, garbage classification recognition, dirt recognition, area invasion, fireworks recognition, smoking, telephone detection, fire channel blocking and other algorithms.
- **Application scenario:** For the community to achieve license plate recognition, face recognition, stranger detection early warning, blacklist control, open fire detection, smoke detection, security personnel leaving the post detection, smoking detection, telephone detection, personnel wandering detection, fence detection, personnel falling to the ground detection, fight detection and other application scenarios.

System framework



Functional characteristics

Intelligent security management platform, based on edge AI box (intelligent NVR) device and combined with AI visual computation Method automatic training function, to create integrated management, fine governance, visual analysis of the "stability.Establish an efficient, co-governing and shared data information management platform."

Application scenario

学校园区

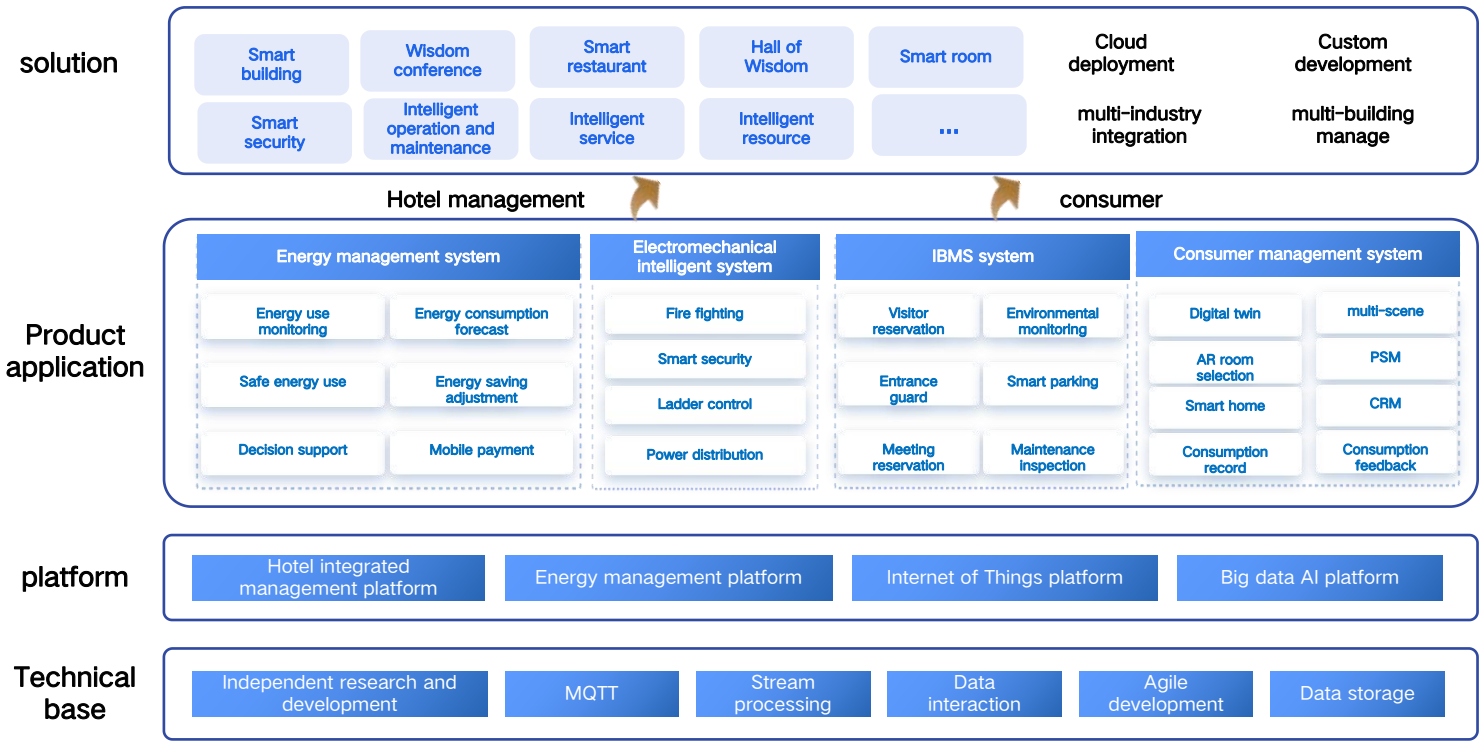
政府园区

智慧社区

Application scenario: Smart hotel solution

- **Scheme overview:** Intelligent hotels rely on AI, Internet of Things, big data technology to achieve digital upgrading of hotel management and other technologies, with intelligent terminal equipment as the carrier, through the operation, management, service digitization, intelligence and network, to provide customers with convenient, comfortable and safe experience, but also improve the security level, service efficiency, reduce management costs.
- **Algorithm application:** Application scenarios such as fireworks recognition, area intrusion detection, face recognition, object detection recognition, fight recognition, fall recognition, stranger entry, stranger trailing, room door personnel wandering, lingering, ground garbage recognition, reception personnel gathering, door license plate and so on.

System architecture



Functional characteristics

1. **Real-time remote monitoring:** It can monitor the movement of personnel and goods in each area in real time.
2. **abnormal event warning:** in the warning area of the system, if the fireworks are detected and reach the upper limit of the domain value, the alarm will be triggered.
3. **regional intrusion detection:** set the forbidden area in the video screen, if someone crosses the warning line or enters the preset forbidden area, the system will send information alarm to the supervisor.
4. **rapid development and integration:** provide rapid development of equipment and applications, with high integration SDK, can shorten the development cycle of APP docking, forming a systematic and comprehensive video convergence system.
5. **flexible, compatible and diversified display:** the platform supports different brands and models of equipment access.

Application scenario: Statistical analysis of passenger flow in commercial complex

- **Application scenarios:** shopping malls and stores in and out of the passenger flow, gender ratio, age, movement trajectory analysis, VIP customer identification, the number of visits to the store, suspicious personnel identification, etc., to assist supermarket timely adjustment of marketing strategies, seize effective target customers, improve customer service experience.

- **Technical solution:** Through the edge computing video analysis AI BOX, access to supermarket and store cameras, according to the channel configuration of the corresponding algorithm, the local identification analysis data is reported to the brand headquarters data platform and complex supervision platform.

- **Landing:** At present, it has landed in the national clothing brand chain stores, jewelry stores, automobile 4S stores, covering the number of stores 100+.

Application scenario

Passenger flow attribute analysis

Analysis of passenger flow trend

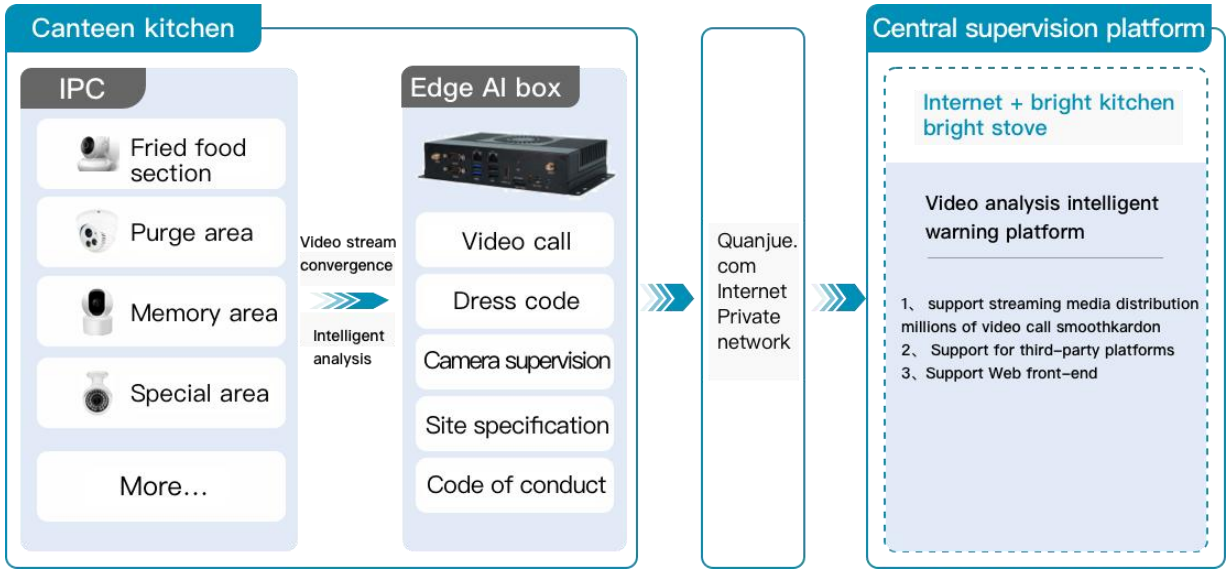
VIP recognition

Store flow statistics

Application scenario: Bright kitchen - kitchen supervision of catering stores

- **Scheme overview:** The AI box equipped with the algorithm middleware platform, with the monitoring of various areas of the site, automatically identifies and judges the operation norms of kitchen and sanitation and personnel, and plays a role in real-time monitoring and early warning and efficient supervision.
- **Algorithm application:** Smoking recognition, garbage can overflowing, rat infestation recognition, mask recognition, personnel operation standards, fireworks recognition, chef clothing and hat detection, telephone recognition, smoke flame recognition and other algorithms.
- **Application scenario:** Exhibition catering, airport catering, hotel catering, chain canteen, central catering and other application scenarios.

System architecture



Application scenario

Exhibition catering

Airport restaurant

Hotel, supermarket catering

Chain catering

Central kitchen

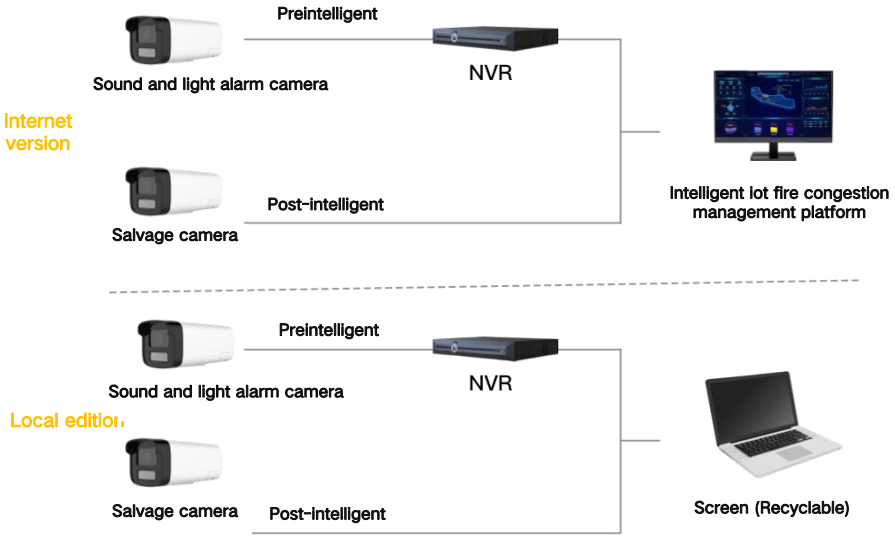
School canteen

Application scenario: Fire lane/evacuation channel occupation solution

- **Scheme overview:** Through the application of video AI technology in fire safety management, real-time monitoring, intelligent identification and alarm disposal of vehicle occupation in fire lanes and blockage of evacuation channels can be realized, and many artificial intelligence applications such as regional fire point detection, smoke identification, illegal charging or parking of electric vehicles, and personnel in the control room can be realized. Effectively solve various hidden problems such as the frequent occupation of fire lanes and evacuation channels, and improve the unit's self-management ability and fire safety level.
- **Algorithm application:** Fire lane occupation detection, battery car illegal parking/elevator, indoor evacuation channel occupation detection and other application scenarios.

System architecture

Community, business district, park, hospital, school fire access, fire entrances and exits

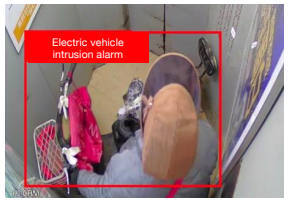


Functional characteristics

1. Implement the supervision and management system through civil air defense + technical defense
2. Detect feedback and intelligent identification of illegal stop behavior through the monitoring technology of Huachao throughout the period
3. Use the integrated management platform of Huaxiao Internet of Things for data management and record violations

Application scenario

Fire truck accounted for the detection



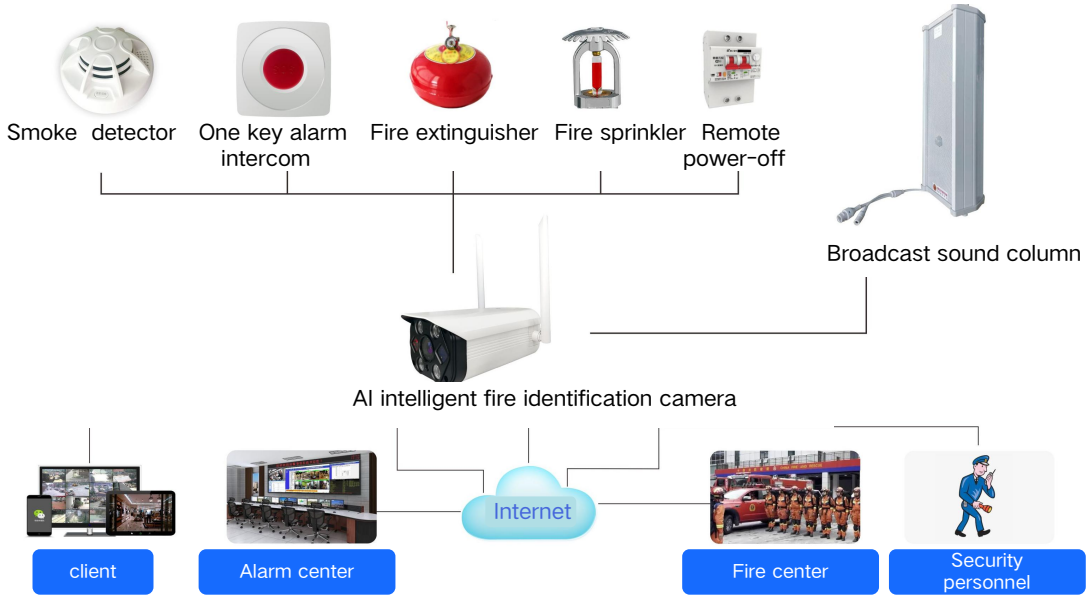
The battery car enters the elevator

Indoor evacuation passage occupied

Application scenario: electric vehicle charging shed solution

◆ **Scheme overview:** Electric vehicle charging shed is based on AI intelligent fire identification camera equipment, artificial intelligence, algorithm recognition and other technologies, when a fire occurs, if the camera detects a fire on the scene, it will immediately link the broadcast pillar for alarm to the alarm center system platform, the administrator client, security operations personnel, and the fire center real-time alarm. It can also control remote power off, fire extinguisher, fire sprinkler head automatic fire extinguisher, quickly extinguish fire, the system also supports a video intercom, remote broadcast, remote video surveillance and other functions, widely used in charging piles, warehouses, factories, shopping malls and other places of fire alarm.

◆ System framework



◆ Application scenario

Street charging station

Park convenient charging station

Community convenient charging station

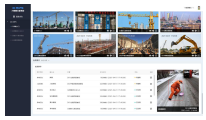
Application scenario: Smart school solution

◆ **Program overview:** The smart school solution collects and analyzes AI video behavior analysis, such as the school gate, dormitory, wall, kitchen and other areas, and then uses algorithm model training, management, and delivery to the front-end edge computing device to deepen the application of campus AI intelligent analysis scenarios.

◆ **Algorithm application:** Fighting behavior recognition, fall recognition, fireworks recognition, smoking and playing mobile phone recognition, personnel stay and other algorithms.

School playground

- Real-time AI video analysis, campus playground border monitoring, campus personnel behavior analysis, fighting, abnormal wandering, illegal entry and other abnormal situations alarm.



Large video surveillance screen

Edge computing platform

camera

Student dormitory

- Student access control, brush face access, record real-time preservation.
- (rest period) personnel stay

Lane gate

Entrance guard

Campus access control

- Staff, students, vehicle access management
- Intelligent visitor reservation, face, ID, QR code and fingerprint recognition mode.

fence

- Border crossing detection

Smart canteen

- Dress code, conduct code, place code.
- Automatic warning, reporting, and recording effectively solve the pain points such as low efficiency of traditional monitoring and difficult traceability, and build a smart upgrade solution that can be upgraded, lightly deployed, and easily managed.

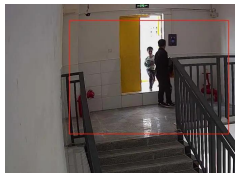
The kitchen is bright and the stove is bright

Smoking identification | Trash can overflowing
Mask recognition | Rat infestation identification
Leave the post with an open fire | Operating specification

...more

Roof/passageway

- Dangerous area invasion



Application scenario: Smart elevator solution

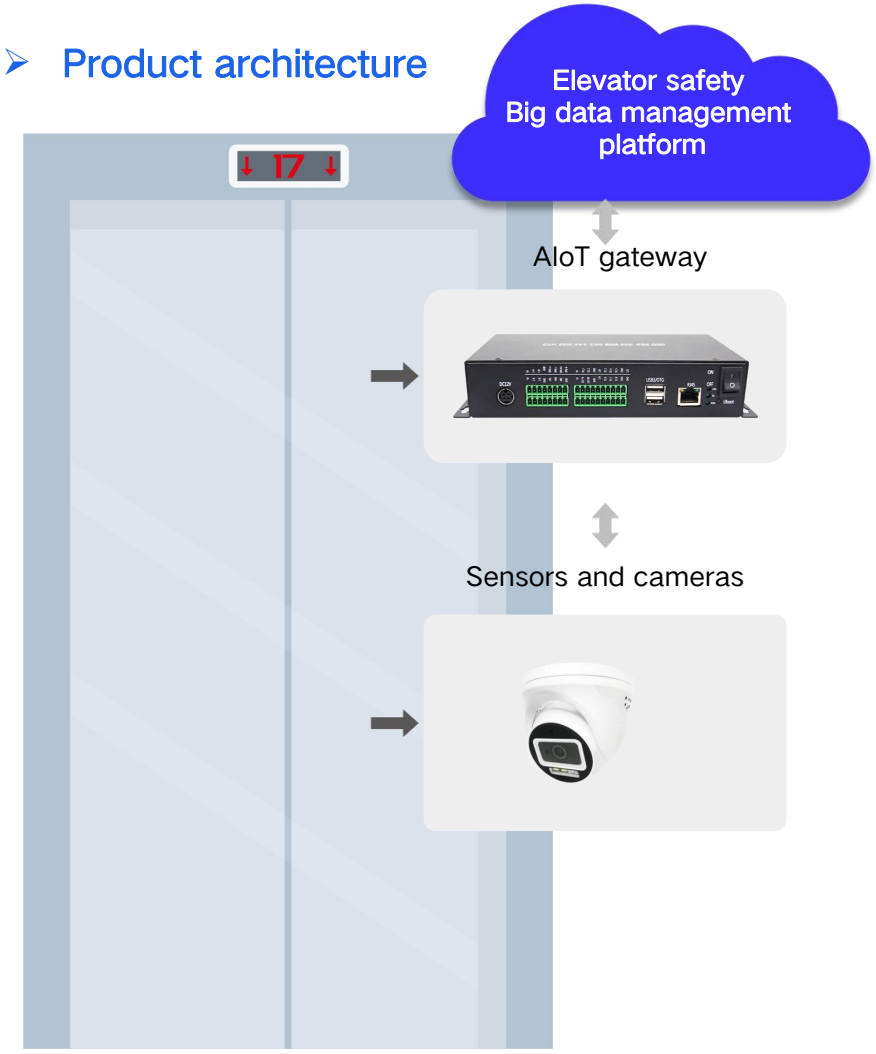
- **Scheme overview:** It is an elevator supervision system based on sensor technology, Internet of Things technology, big data analysis technology and cloud computing technology. Its main functions include real-time monitoring of the operating status of the elevator, finding abnormal situations and timely alarm to reduce the accident rate. To realize the centralized management of elevator operation data, it is convenient for managers to carry out real-time monitoring and remote operation of elevator operation.
- **Algorithm application:** 人Shape counting, electric vehicle detection, fireworks recognition, opening and closing doors, foreign body blocking doors, liquefied gas cylinder recognition and other algorithms.
- **Application scenario:** Should be in residential areas, commercial office buildings and public transport places.

Humanoid count

Electric vehicle detection

Pyrotechnic identification

Product architecture



Application scenario: Smart site solution

- **Scheme overview:** Smart site is an overall solution based on modern technologies such as the Internet of Things, cloud computing and big data around the three core elements of "people, machines and materials" in construction sites. Based on the four major businesses of site visualization, real-name management, real-time monitoring, and full vehicle entry and exit record, multi-dimensional expansion services such as tower crane safety monitoring, schedule management, quality supervision, and cost control are formed to ensure safe and efficient site management.
- **Application algorithm:** Helmet, reflective clothing, smoking, telephone identification, intrusion detection, flow detection, departure detection, sleep identification, crowd identification, vehicle detection, illegal parking, water, manhole cover, channel blockage, gate state, seat belt, guard clothing, fall and other algorithms.

Intrusion detection

- Use the camera to identify in real time whether other strangers have invaded the forbidden area. If found, immediately alarm, alarm signal synchronous push to the manager.

Departure identification

- Departure recognition is based on the computational AI vision algorithm, with the on-site camera, automatically identify the departure behavior of the monitoring room.

Vehicle detection

- The camera is used to detect all vehicles in the medium and low height shooting scenes.

Safety risk identification

- Through the camera automatically identify the safety helmet wearing situation in the work area of the construction site, reduce the occurrence of safety accidents.

Fall recognition

- Automatically identify the personnel fall accident in the site, real-time warning, timely rescue, effectively reduce the error and cost of human supervision, and improve the safety of public places.

Reflective clothing recognition

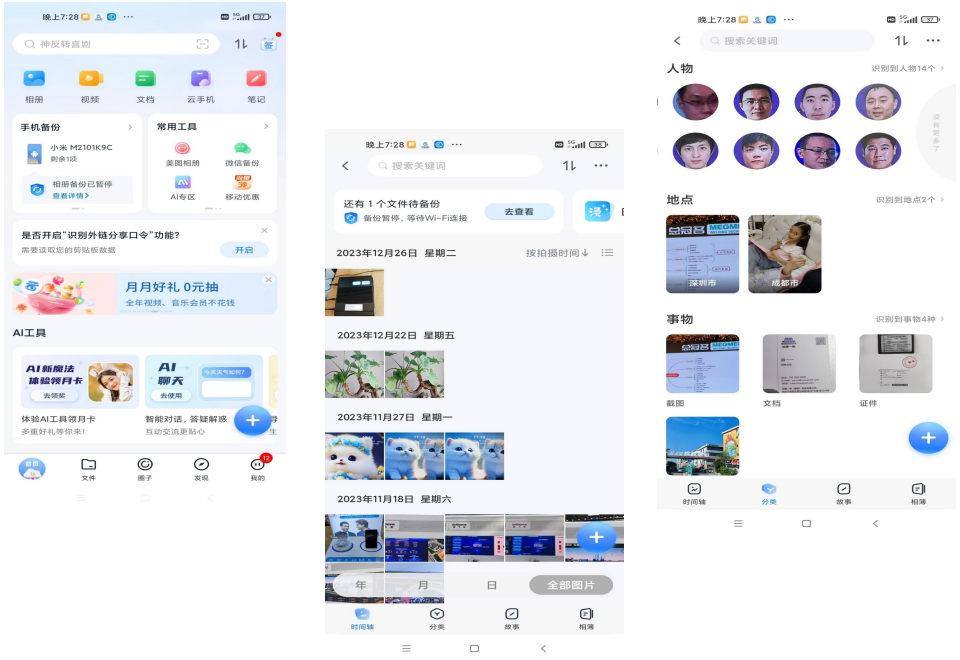
- Automatic recognition of compliance Wearing reflective overalls,
- Real-time reminder records to prevent security accidents.

Gate state

- Automatic door opening is achieved by using sensor devices such as cameras to identify the state of the door (open or closed).

Application scenario: Intelligent NAS - Home/company/enterprise private cloud server

- **Scheme overview:** Add AI functions on the basis of traditional NAS to enhance user experience, and can access home/enterprise smart devices, but also according to the timeline classification story line management photos and videos for unified management, efficient automatic processing of storage content and multi-end communication, to ensure privacy and security, save traffic costs.
- **Algorithm application:** Scene recognition, object recognition, text recognition, face recognition, action recognition, similarity recognition, image processing and other algorithms.
- **Application scenario:** TO C home server/private cloud.



Interface diagram

AI vision analysis

Scene recognition

Object recognition

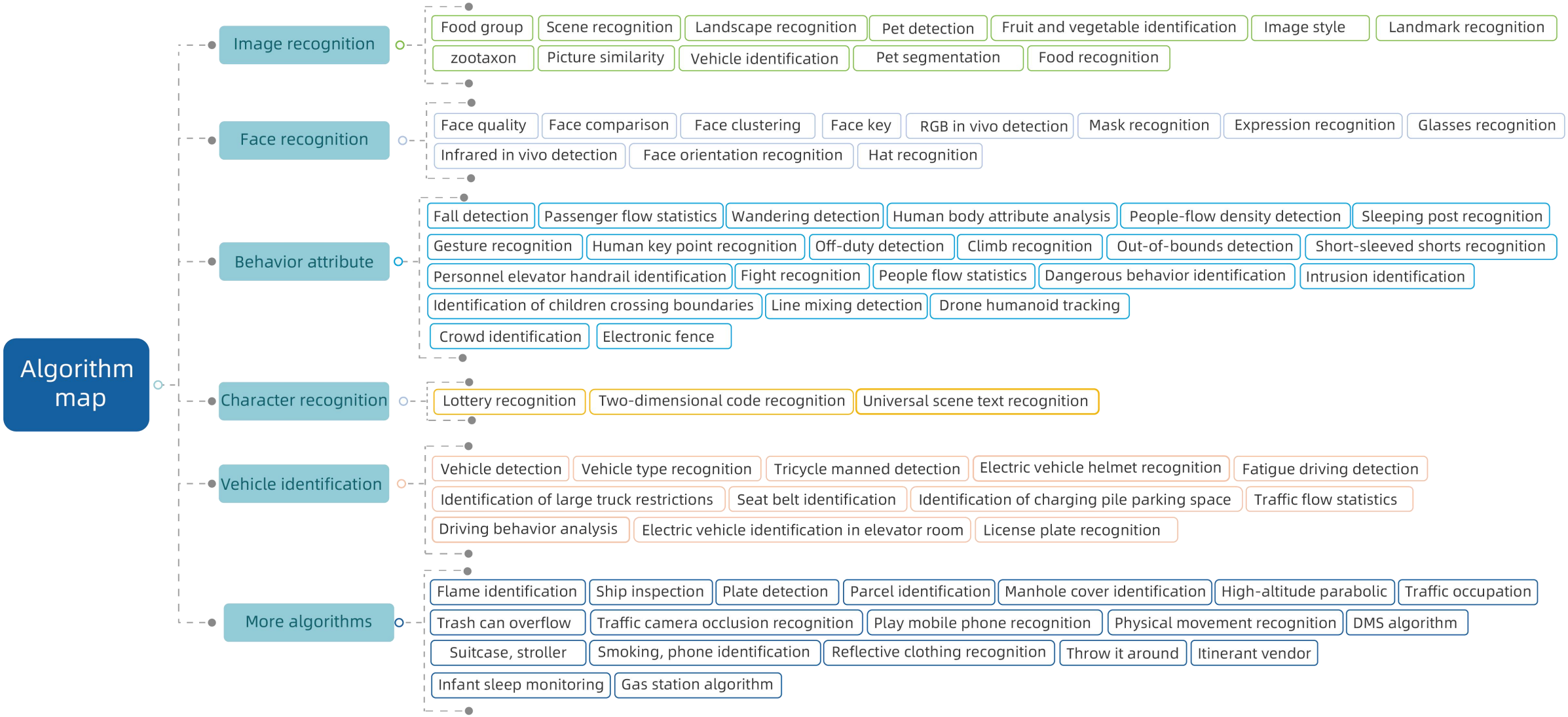
Character recognition

Hardware specification

CPU	RK3568, 4-core, main frequency 2.0GHz
NPU	1TOPs
Internal memory	2GB/4GB/8GB
store	EMMC 16G（8G/32G/64G/128G selectable）
USB port	2 a USB3.0,2个USB2.0
Network support	Multiple RJ45 ports，10M/100M
	2.4G/5G Wi-Fi, BT support
	Support 4G network
HDMI	1个HDMI_Out
Power source	DC12V

CPU	RK3588, 8-core, 4xCortex-A76+4xCortex-A55 2.6GHz
NPU	6TOPs
Internal memory	64bit LPDDR4/5　8/16/32GB
store	EMMC Patch available with +T card /SSD 16/32/64G optional
USB port	4 USB3.0,2 USB2.0
Network support	RJ45 Gigabit network port
	2.4G/5.8G　300Mbps
	Supports 4G and 5G networks
HDMI	1个HDMI_Out
Power source	Wide input　12-24V DC

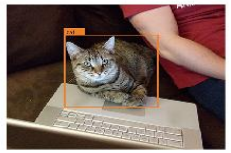
Algorithm map



Algorithm presentation


Flame identification


Fall detection


Pet inspection


Battery car detection


Face capture

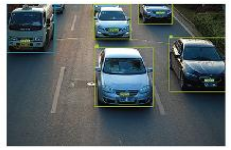

Mask recognition


Face junction


Fixation length


Out-of-bounds detection


Mobile humanoid


Vehicle detection


Helmet testing


Pedestrian counting detection


Face segmentation


Face attribute


In vivo detection


Non-motor vehicle identification


License plate recognition


Electronic seal


QR code recognition


DMS algorithm


Universal object recognition


Universal landscape recognition


Charging pile occupation identification


Driving behavior analysis


RGB in vivo detection


Escape route


Universal scene recognition


Pet classification


Crowd identificationn


zootaxon recognition


Face clustering


Food recognition


Landmark recognition


Fruit and vegetable identification

Infrared in vivo detection

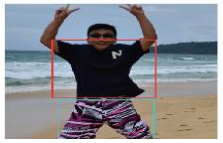
Expression recognition


Helmet identification


People flow statistics


Climb recognition

Algorithm presentation


Short-sleeved shorts recognition


Personnel lifter identification


Universal scene text recognition


Two-dimensional code


Smoking call recognition


Smoking call recognition


Smoke identification


Wandering recognition


Fight recognition


Reflective clothing recognition


Camera occlusion recognition


Vehicle type recognition


Traffic flow statistics


Plate detection


Parcel burst warehouse identification


Elevator is difficult to identify


Intrusion identification


Child transgression


Hand analysis and tracking


Tricycle manned detection

Big trucks are banned

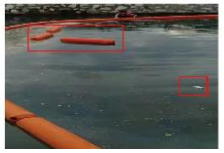

Electric vehicle helmet


Pedestrian attributes and actions


Ship inspection


Water identification


Busy billboard identification


Identification of river floats


Passenger flow statistics


High-altitude parabolic

Luggage inspection


tramp


Occupation management identification


Elevator opening and closing


The monitoring room is off duty

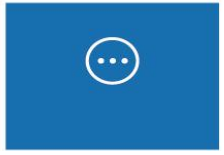

Parcel movement identification


Sleeping post recognition


Tired driving


Stroller testing


Hallway debris piled up


More algorithms

Thank you

Welcome to cooperate and consult

Shenzhen Moocoo Technology Co., Ltd.