



VP04 SDK

Business

Introduction

Acuity VP04SDK

Chip Specifications

- Main processor CPU:Quad-core ARM Cortex A53@1.3GHz
- Smart Processor NPU:NeutronTM 28.8TOPs@INT4 supports many mainstream deep learning frameworks
- Mixing accuracy support
- Intelligent Image Processor ISP:ProtonTM 4K@60fps Support AF, AE, AWB, AI-HDR, AI-3DNR, AI-RLTM, AI-Demosaic
- Maximum encoding capacity:H.264/H.265 4K@60fps
- Multi-stream real-time encoding capability: H.264/H.265 4K@30fps+1080p@30fps+1080p@30fps+1080p @30fps
- Maximum decoding capacity:H.264/H.265 4K@60fps •
- DDR:Support 4266Mbps LPDDR4/LPDDR4x, support up to 16GB
- Support eMMC5.1/SPI Nor Flash/SPI Nand Flash
- Hardware interface: Support 2x4Lane MIPI, support dual Camera, support RGMII interface mode Ethernet Support USB/SDIO Wifi, support HDMI 4K@60fps
- Package: ROHS, FC-CSP 15.5mmx15.5mm

Algorithm function

- Face person function (face person binding +identification 8 way)

Face detection, human detection, face &human tracking, face-human binding, face attributes, human attributes, live body, feature extraction, comparison (300,000 in the base library)

Current version 8-way, next version 16-way

- Structured function (full structured + license plate recognition 16 way)

Face / human body / motor vehicle / motor vehicle license plate / non-motor vehicle capture, license plate recognition

, human attributes, face attributes, motor vehicle attributes, non-motor vehicle attributes

- Alert function (perimeter 16 channels, perimeter + action 8 channels)

Perimeter: personnel crossing/intrusion/over the wall detection, personnel wandering, vehicle crossing/no parking/leaving;

humanmotion recognition: running, falling, looking down at the phone, talking on the phone, smoking 2021/4

- Video behavior analysis function (attendance 16 channels,behavior analysis 12 channels)

Attendance recognition; behavior analysis supports facial expression, behavior recognition, facial orientation etc. 2021/5

Function description - Face person binding + identification

Face Detection	Detect 1 and multiple faces in still pictures or dynamic video streams and give the position of the face
Face Tracking	Detects a face in a dynamic video stream and associates each frame in which the face appears in the video
Humanoid Detection	Detects a human body in a still picture or a moving video stream and gives the position of the body, including the back body
Human tracking	Detect 1 and multiple human figures of one person in a dynamic video stream and associate each frame in which this human body appears in the video
Face person binding	Detect faces and bodies in still pictures or dynamic video streams, and give the relationship between faces and bodies
Face attribute recognition	Recognition Age, gender, eyes, mask, beard, headgear and other attributes of the detected face
Human attribute recognition	Identify the type and color of the upper and lower clothes of the detected human body, the hairstyle, the type of backpack (handbag) and umbrella, etc.

Face feature extraction	Turning information about faces into data that models can recognize
Face Matching	Provide a base library photo feature, compare the captured face features with the base library features, and output the ratio score value
In vivo testing	Determine whether the detected face is a real person or a non-real person

Use scenario - face person binding + identification

The face function is applied to the image bayonet scenarios such as personnel channel or entrance/exit of parks, buildings, enterprises, etc. Functions such as face capture, perceptionless attendance, blacklist alert, store VIP, etc., and the human line function applications such as human body retrieval, human body track, cross-border tracking in monitoring scenarios.



Example: personnel access or entrance/exit scenes



Example: monitoring scenes



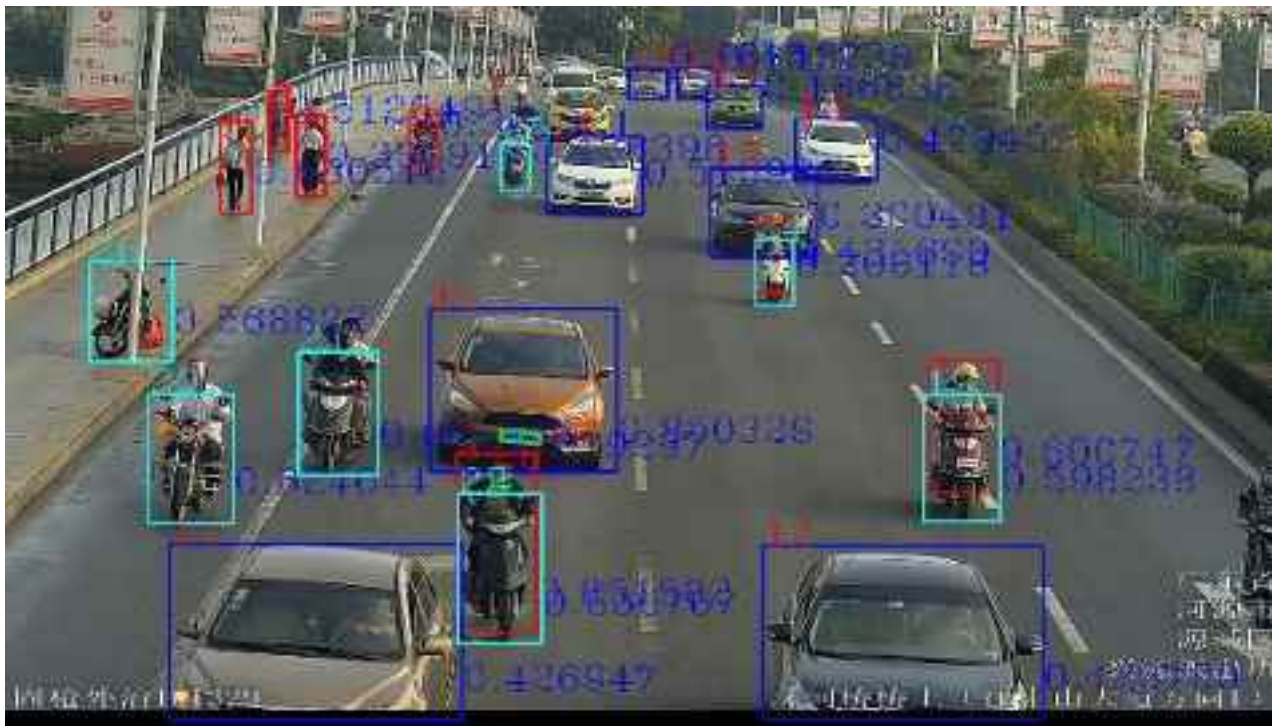
Feature Description-Full Structured + License Plate Recognition

Five types of testing	Detect 1 or more faces, human figures, motor vehicles, non-motor vehicles, license plates in still pictures or dynamic video streams and give Its coordinate position
Non-motorized vehicles and people Binding	Judging the relationship between human form and non-motorized vehicles, if judged as a person riding a bicycle, it will output the capture map of people and non-motorized vehicles as a whole
Car-plate bundle	Detect motor vehicles and license plates in still pictures or dynamic video streams, and give the relationship between motor vehicles and license plates
Face Body Binding	Detect faces and bodies in still pictures or dynamic video streams, and give the relationship between faces and bodies
Face Properties	Recognize age, gender, glasses, masks, beards, hats, hairstyles and other attributes of the detected faces
Human Body Properties	Body attributes include 15 items, namely: top color, bottom color, gender, hair length, hat wearing, top style, bottom style Style, skirt, bag, umbrella, cycling (non-human bound alternative), shoulder bag, shoulder bag, handbag, trolley bag
Car Properties	Direction (front, rear, other), brand (main brand, year, sub-brand), color (9 types)

License plate attributes	License plate color
Motor Vehicle Classification	Six categories: small cars, SUVs, vans, medium and large buses, pickup trucks, trucks
Non-motorized vehicle classification	Four categories: bicycles, electric vehicles, motorcycles, tricycles
Action	Running, falling down, looking down at the phone, talking on the phone, smoking
Safety helmet testing	One of the human body attributes, to determine whether the body has a helmet, can not give helmet color judgment for the time being

Usage Scenario - Full Structured + License Plate Recognition

Used in large and medium-sized city secondary road micro junction (3559A single full structured/3519AV100 single full structured), small and medium-sized city arterial or branch road road side (3559A/3519AV100/3516DV300 full structured), residential district entrances and exits, back streets and alleys around the district and other high frequency Activity area.



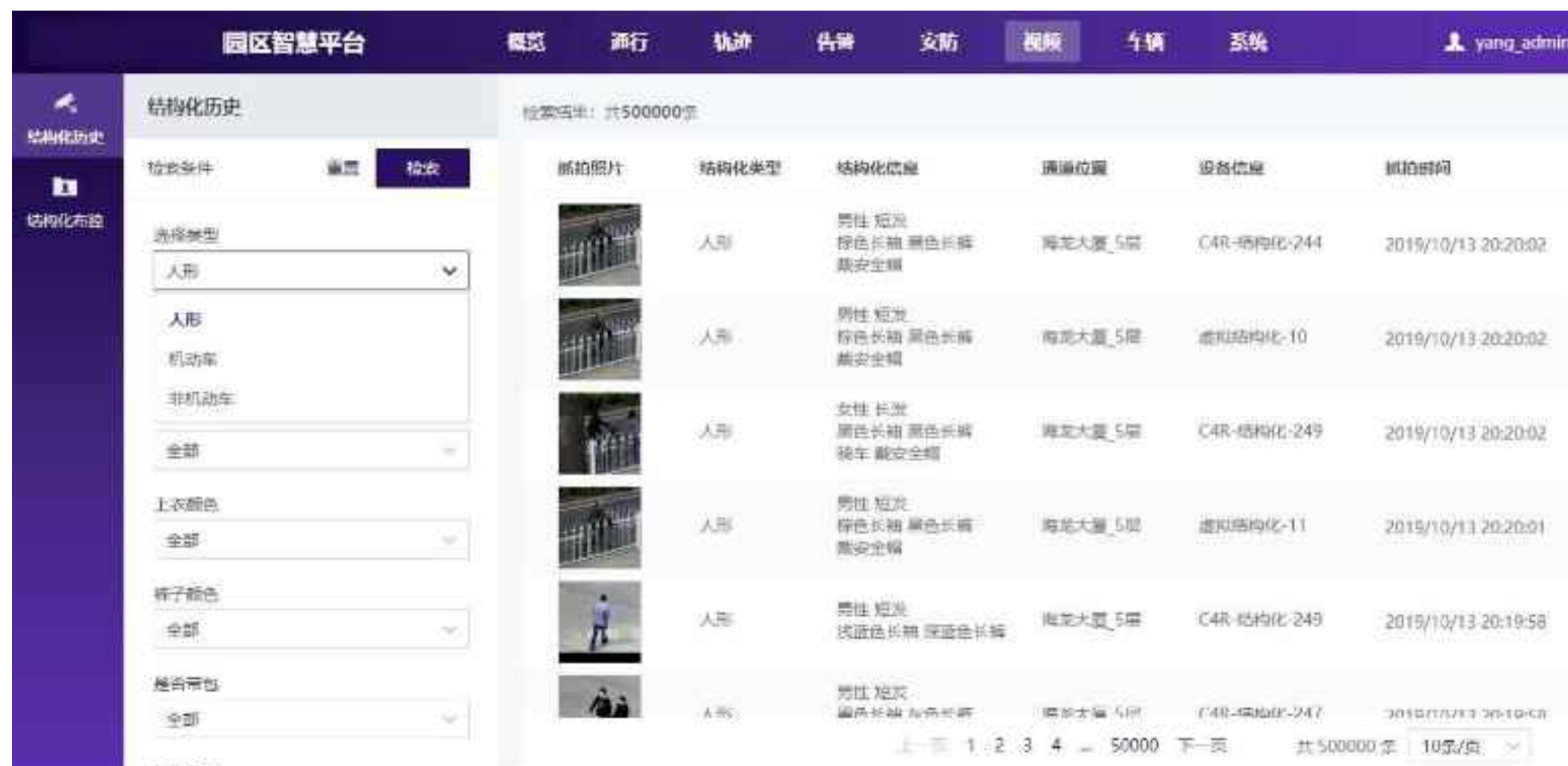
Example: Micro chokepoint on secondary roads in large and medium-sized cities Example: Roadside of medium and small urban trunk roads or branch roads Example: Entrance/exit of residential district, back of district perimeter

High frequency activity areas such as streets and alleys

Usage Scenario - Full Structured + License Plate Recognition

Structured the key features extraction of people in the video, extracting the structure of people's gender, age, ethnicity, clothing and costume from the video or pictures

Chemical data.



Usage Scenario - Full
Structured + License Plate
Recognition

White

Body color

Black, white, red, yellow,
blue, green, purple,
brown, gray, etc.

Features:
None

Features

Annual inspection mark, tissue box, pendant,
sun visor, ornament,

Sedan

Vehicle Type

Cars, minivans, large trucks, vans,
minibuses, large buses, off-road
vehicles, commercial vehicles, etc.



BMW

Brand Model

Headers \geq
5500 kinds
of parking
spaces \geq
3500 kinds

MFA 8003

License
plate
number

yellow and green support a variety of
number types

License plate color: black and white, blue,

Extract the vehicle key features (such as license plate, model, brand, color, feature object, etc.),
application scenarios such as vehicle big data scenarios, to meet the key vehicle tracking, control,
early warning, etc.

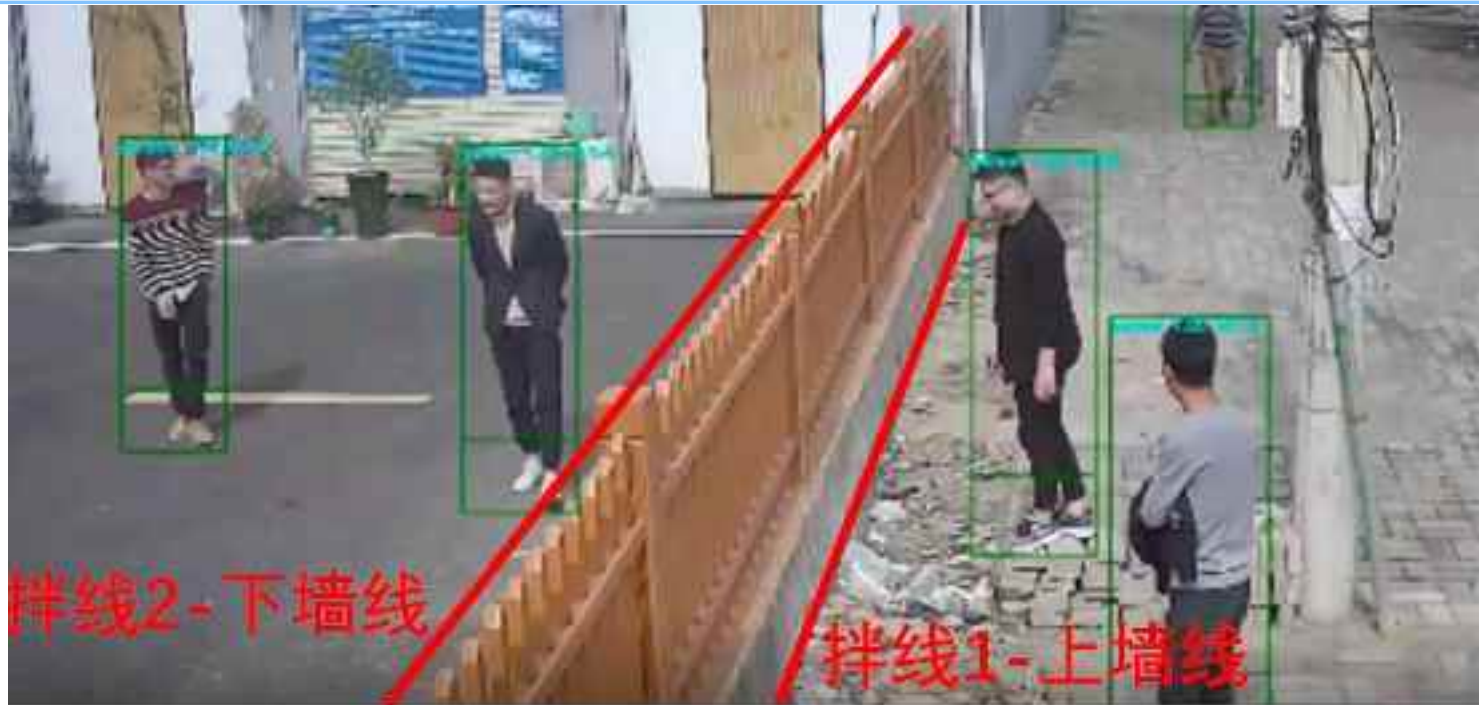
Function description-vigilance

People over the wall (double tripwire)	Two-way double trip wire detection, the human body touches the wire, giving an alarm signal.
People crossing the border	One-way single tripwire or two-way single tripwire detection, giving an alarm signal when the human body crosses the line.
Personnel intrusion (entering area & leaving area)	Judgment of the state of the human body entering the region or leaving the region, supporting the drawing of 1 irregular polygon closed region (3-8 sides)
Personnel wandering	Determine whether people are wandering according to the length of stay, and support drawing 1 irregular polygon enclosed area (3-8 sides)
People on duty - Basic version (side view mode + top view mode)	According to the state refresh cycle timed query area of the value of the post OR leave the post state, support drawing 1 irregular polygon closed area (3-8 sides)
Vehicle Crossing	One-way single tripwire or two-way single tripwire detection, motor vehicles, non-motorized

	vehicles across the line, give an alarm signal
Vehicle parking ban	Mainly for motor vehicles, non-motorized vehicles in violation of parking rules, in the non-parking area to do the visual monitoring, support the drawing of 1 irregular polygon closed area (3-8 sides)
Vehicle departure	Determine the state of motor vehicles and non-motorized vehicles leaving the area and support drawing 1 irregular polygon enclosed area (3-8 sides)
Motion Recognition	Running, falling down, looking down at the phone, talking on the phone, smoking
Number of routes	Perimeter function other than motion recognition 16 channels, perimeter + motion recognition 8 channels

Usage Scenario -Vigilance

For perimeter security, personnel supervision and other scenarios, providing functions including over the wall, personnel crossing/invasion/wandering, vehicle crossing/no-parking/leaving, personnel on duty, action things to help, etc.



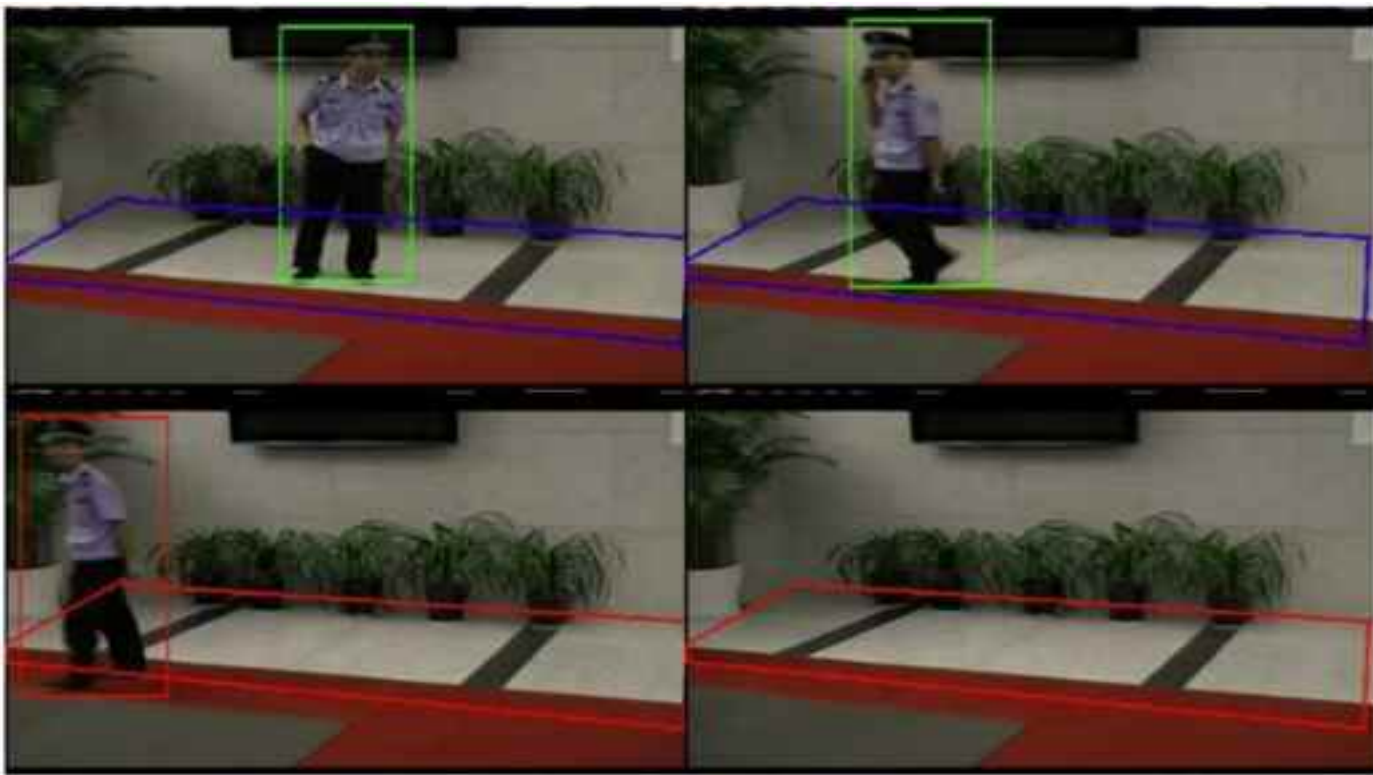
Example of wall climbing: wall climbing key area monitoring



People intrusion example: dangerous area people intrusion alarm



Example of vehicle parking ban: fire passages, entrances and exits, one-way streets Square and other no-parking areas



Example of personnel on duty: key monitoring personnel on duty status

Function description - Video behavior analysis

Attendance recognition	Support attendance recognition for both cruise camera and 4K camera modes
Behavior Analysis	Support two behavioral analysis dimensions of the overall and individual in the picture, support algorithm capabilities including face expression, behavior recognition, facial orientation, etc., can set the range according to the demand scene
Face expression recognition	include three major classifications: positive, negative, and neutral; and subcategories: happy, surprised, confused, disgusted, angry, scared, sad, and neutral.
Behavior Recognition	Identify the detected human behavior of standing, raising hands, lying on the table, reading, writing, playing with cell phone, other
Facial orientation	Facing the front of the score

Video behavior analysis- use scenario examples

Classroom-based perception-free and cooperation-free face attendance based on cruise cameras or 4K cameras



- Application Scenarios
New high school class scheduling and student attendance management
- Function Description
Class dimensional classroom behavior statistics based on student expressions and behavior recognition

- Application Scenarios
Teachers' teaching quality scores, student classroom behavior evaluations, and big data analysis of classroom behavior as a means to assist teaching.
- Function Description
Class dimensional classroom behavior statistics based on student expressions and behavior recognition

Video Behavior Analysis - Capability Legend

Behavior Recognition



Lie on the table



Standing



Hands up



Playing with cell phone



Reading



Writing

others

Normal



Happy



Neutral



Sorry



Surprised



Fearful



Confused



Angry



Disgusted

Embedded Algorithm Warehouse

For intelligent terminal hardware based on VP chip platform, we realize the embedded algorithm warehouse architecture that can be software-defined intelligent terminal hardware, provide embedded basic development kit with chip and algorithm capability as the core, and empower product development enterprises to make better end-side intelligent products.

Our Advantages

- Better algorithms: higher accuracy in the main channel algorithm and better productivity in the long tail algorithm
- Better chips: more arithmetic power and better cost performance
- Greater integration: enabling hardware support Software supporting hardware
- Success stories: SDK-type customers and related business model success stories

Hardware

- Box-based



CHONGQING HUIFAN TECHNOLOGY CO.,LTD

www.hfteco.com

www.hfsecurity.cn

email:info@hfcctv.com