

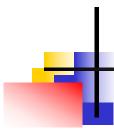
Technical Solution



Fangzhou Technology (China) safe city construction practice and experience sharing

By Guiyang Fangzhou Technology Co., Ltd.





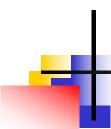
- Founded in 1998 in Guizhou, China, Fangzhou Technology is a high-tech big data enterprise dedicated to smart city construction, a new smart (safe) city solution provider, and one of China's top 100 security enterprises.
- Since undertaking the first safe city project in Guizhou province in 2005, Fangzhou Technology has been focusing on the construction of smart (safe) city project for 17 years, and now we have participated in the construction of safe city project in nearly 30 cities. We have set up R&D institutions and service teams in Chengdu, Beijing, Hong Kong and Pakistan.





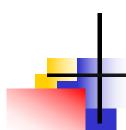
Chinese Experience





1. Overview

- 2. Public security video surveillance system
- 3. Intelligent transportation system
- 4. Network transmission system
- 5. 4G LTE PTT cellular network telecommunications
- 6. Public security anti-terrorism early warning system
- 7. Police drones
- 8. Operation and maintenance Management platform
- 9. China's plan and Guizhou's experience
- 10. Acknowledgement

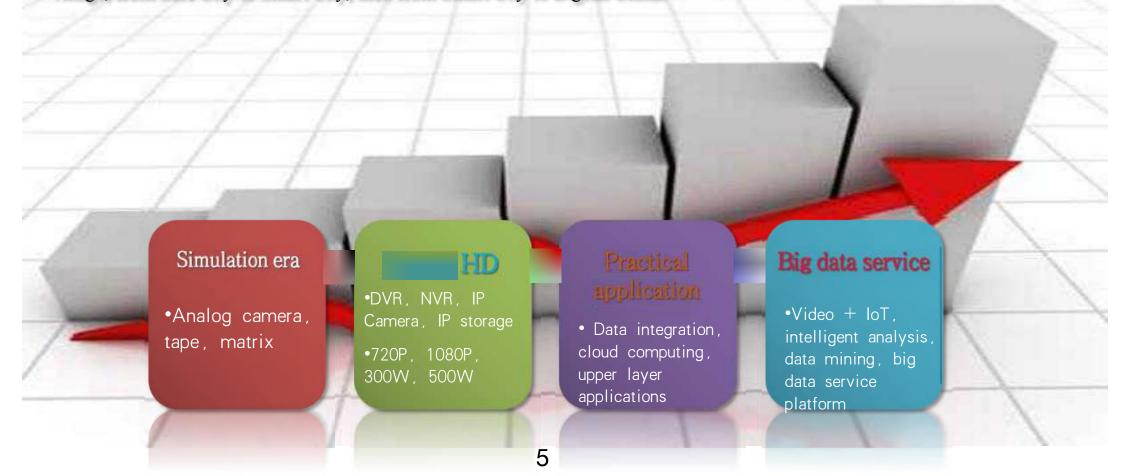


1. Overview

Development and evolution of safe cities

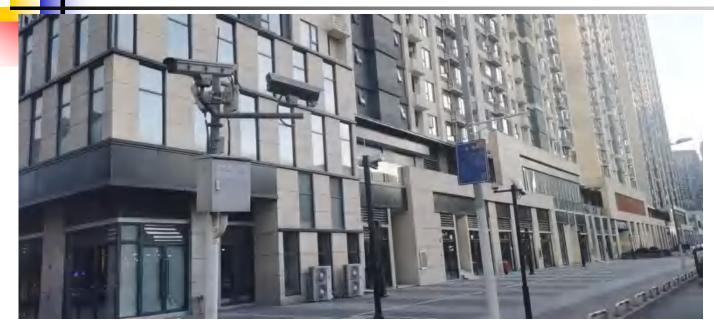


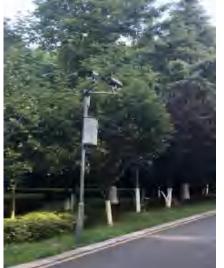
- 1. Skynet engineering construction: from analog to digital; From SD to HD; From front-end to platform applications;
- 2. Safe China Construction: from Skynet Project to Public Monitoring Project; From public safety to safe communities;
- 3. Digital China Construction: From Safe Community to smart Community, from Public Monitoring Project to digital village, from Safe City to Smart City, then from Smart City to Digital China.



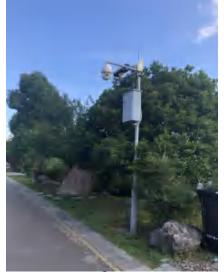
Development and evolution of safe cities















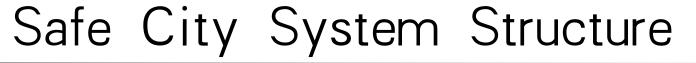




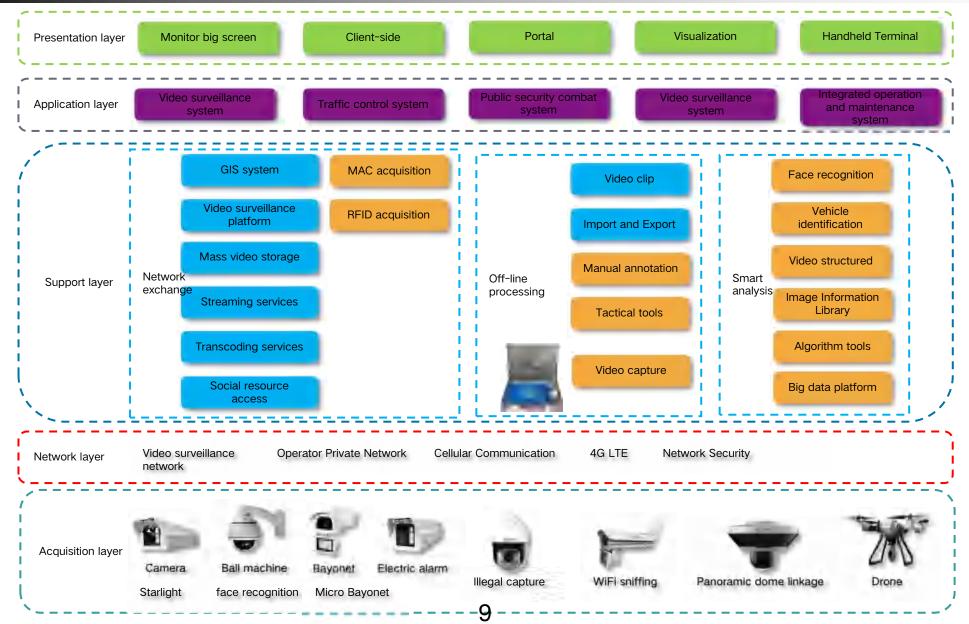




2. Public security video surveillance system

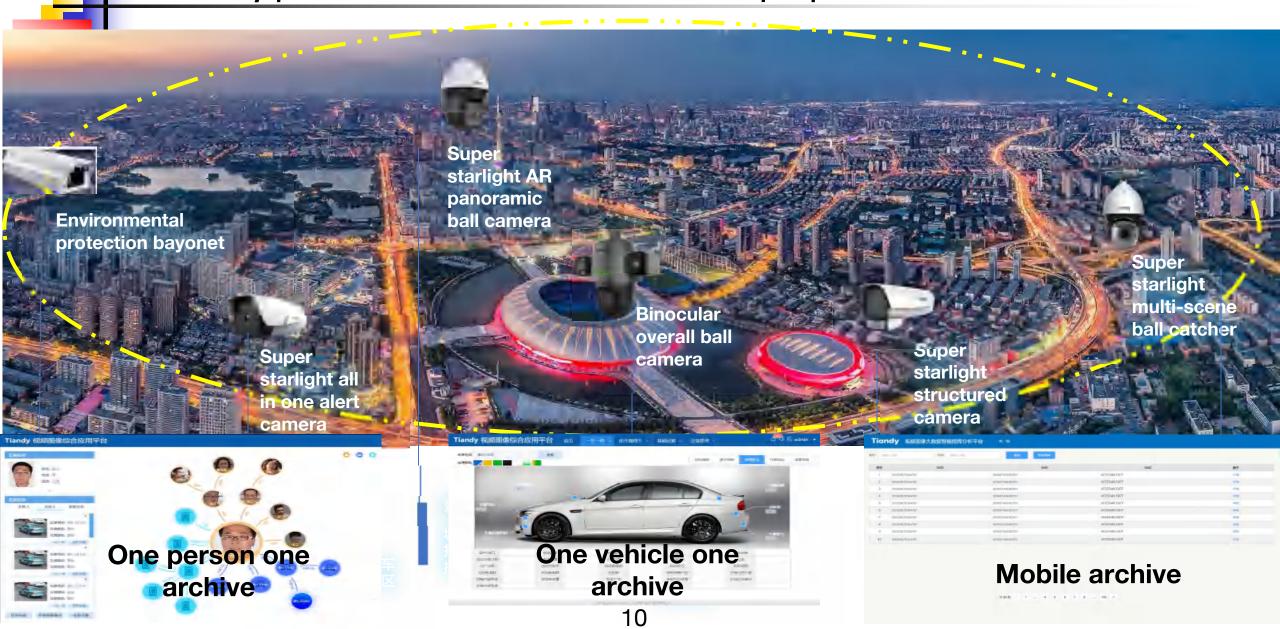






All types of front—end equipment







Front-end acquisition and perception system



Construction purpose

Video, Time and Place

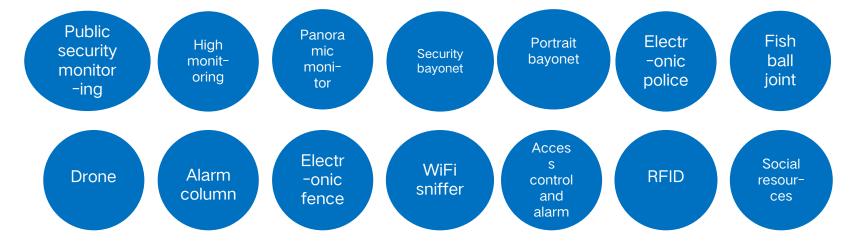
Vehicle: License plate, color, model, logo

Person: Face, clothing

Event: Large-scale activities, traffic

situation, cases, emergencies, disasters...

Construction content



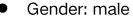
Construction target

- 1. Build a multi-layer prevention and control network;
- 2. Full core coverage, no dead corner;
- 3. "Car and people left traces" the whole pan-bayonet;
- 4. Integrated access of social meeting video;
- 5. Multi-dimensional IoT data access such as alarm, access control, social parking lot;

Chinese Experience

Multidimensional awareness





Whether to wear glasses; Whether to mask; Whether backpack; Whether with a hat

Age: Middle age

Coat color: black

Model: tricycle

Vehicle color: blue

Passenger gender: male

No helmet

License plate numban H***C

Multi-dimensional sensing camera

All structured Mobile phone IMSI collection 4K HD long zoom



License plate number: Jin A1***5

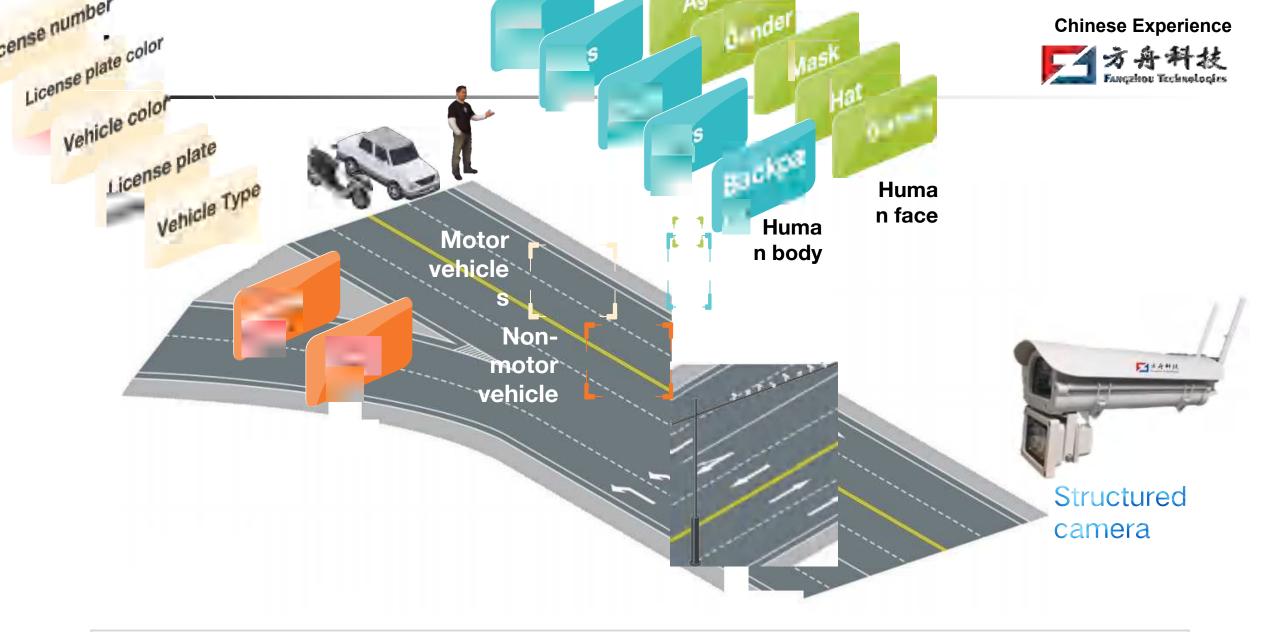
Model: Sedan

Brand: TOYOTA

Vehicle color: white



Intersections, entrances and exits, etc.: Mobile IMSI codes can be collected at the same time as motor vehicle, non-motor vehicle and human information collection, so as to achieve small scene association of human-vehicle code aggregation



Road prevention and control: full feature recognition of motor vehicles, non-motor vehicles, face and human body, super starlight subversive vision technology

Chinese Experience

Linkage application of ball and gun cameras



- Double moving point, double zoom, double 5MP, double MIC, double speaker
- Double complementary light: panoramic white light + detail infrared
- Fully structured; red, blue, sound and light alert
- Heat map, helmet testing, separation of people and vehicles



overall ball camera

Outdoor

Spec: 0/A/2.8-12mm/9-54mm

PTZ-bullet: 1/1.8" Speed Dome: 1/1.8"





Intersection, bus station, entrance and exit monitoring dual-area scenes: dual cameras, larger field of vision, more details

Chinese Experience

Face capture camera







Entertainment places, squares and other densely populated areas: face accurate recognition, second-level retrieval, to achieve precise prevention and control of complex areas.







Bayonet application

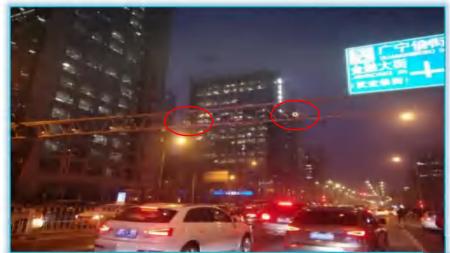




Environmental protection bayonet

Face extraction





- Take photos of pollution without light
- Driver face forensics
- 23 kinds of detection
- 22 kinds of vehicle behavior capture



Security bayonet: supported by deep learning algorithm, no light pollution vehicle capture, face extraction, realizing 23 kinds of detection, 22 kinds of vehicle behavior capture



Panoramic coverage+ ball

camera linkage_{8+1 (16 million pixels) / 4+1 (800 pixels) optional}



Fat gett

- 360 ° / 180 ° panoramic view
- Cooperating with ballhead camera to achieve linkage monitoring, automatic tracking, and detailed snapshots
- Star level monitoring effect





Ball camara for capture of driving against traffic regulations

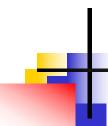


Automatic detection of violations

Integrate vehicle illegal behavior analysis algorithm to detect illegal parking, retrograding motion, line pressing, nonguided driving, illegal U-turn.

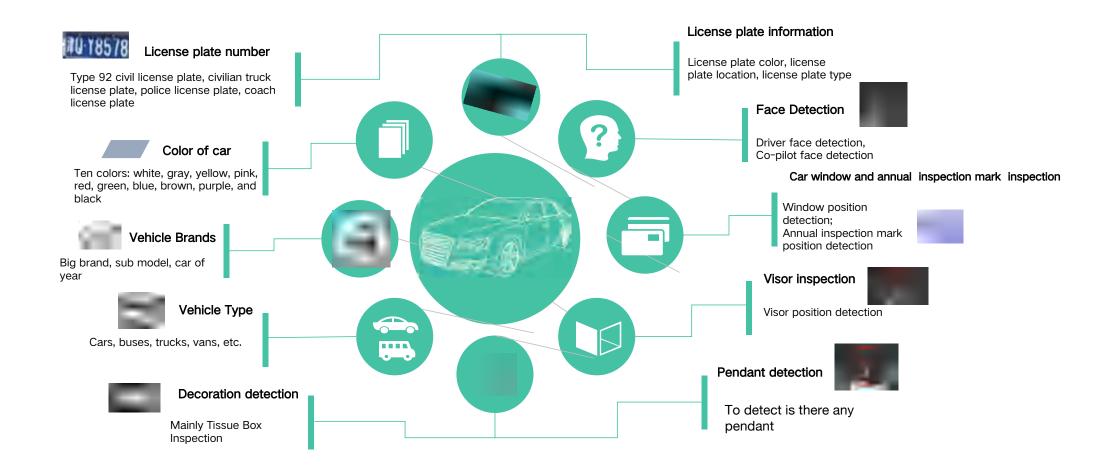






Vehicle information identification

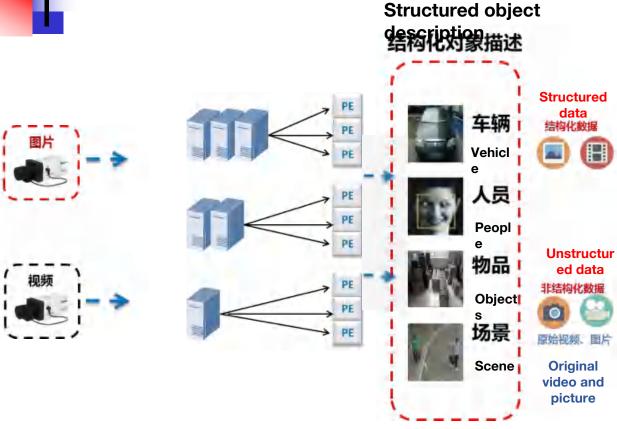


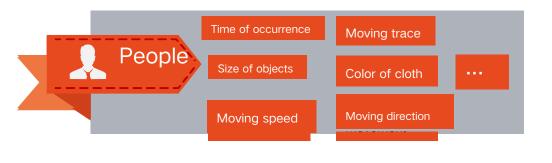


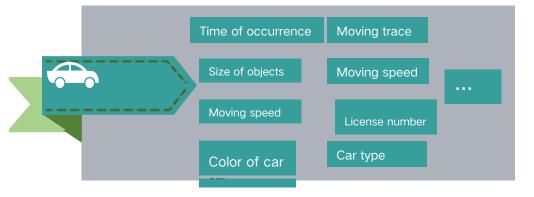


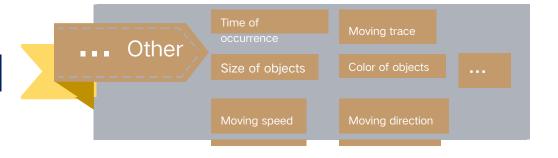
Video structured analysis









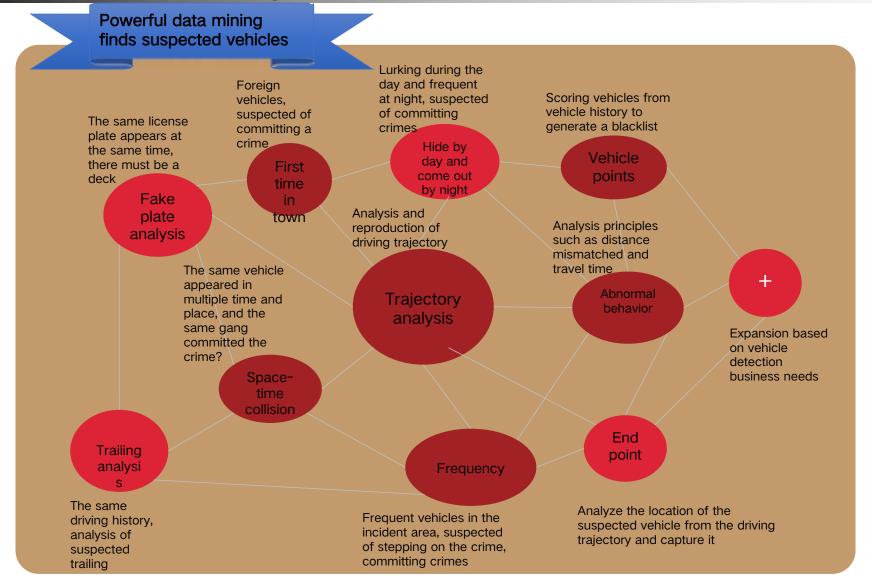


Video structured--qualitative change from media stream to video content information stream



Data mining tactics





Suspected vehicle tactics











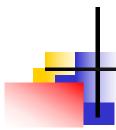
Features:

- •Multi-window group polling
- •Patrol plan, patrol route, patrol alarm
- •PTZ control
- •Instant video playback
- •On—site assistance
- •Video retrieval playback
- •Video annotation, download and upload
- •GIS positioning and playing videos
- •GIS alarm linkage
- •Large screen splicing control

Police 3D platform





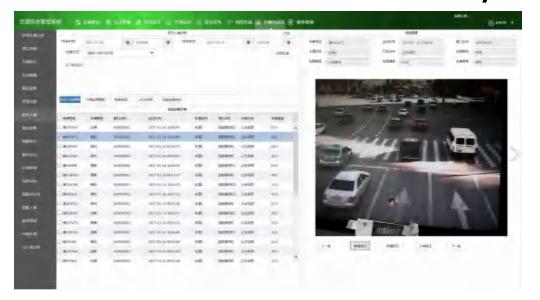


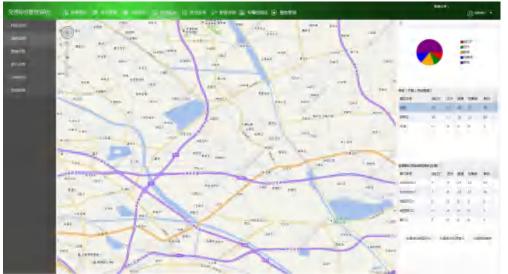


3. Intelligent transportation system



Traffic control system





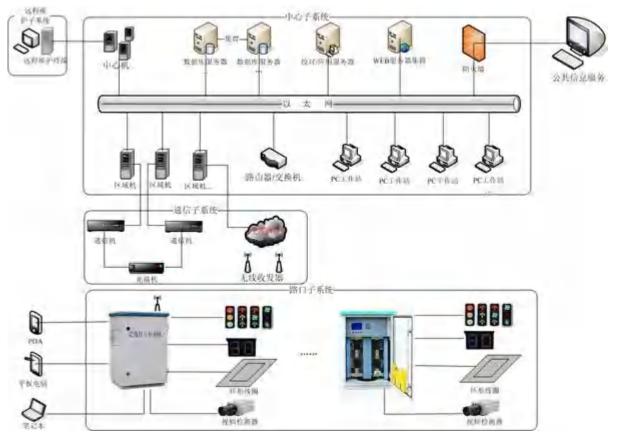
Interface of the comprehensive traffic control system, including: road situation, illegal situation, warning situation, equipment situation, deployment control and alarm, vehicle control, illegal management, public security monitoring, induction and release, command operations, vehicle technical conflict and other tools



Traffic signal control system

Through the traffic signal control server and the local signal controller, the traffic signal control system realizes the network control of the signal center at the intersection by the command center.

- ➤ Multi-period control
- ➤Induction control
- ➤ Special vehicle priority control
- ➤ Central mandatory control
- ➤ Schedule control



Traffic guidance information



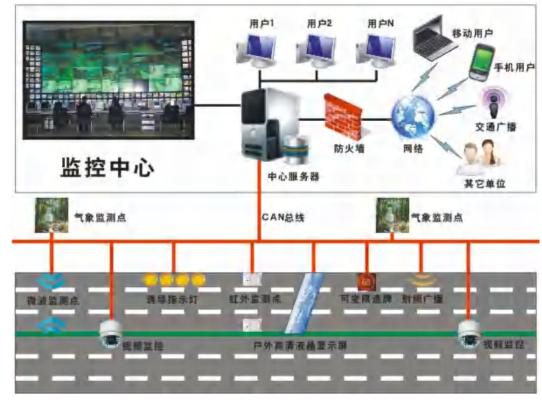
Sylvation fransportation guidance system is an important part of the Intelligent Transportation System (ITS). It takes travellers as its main object and provides travelers with real-time traffic information and services through various communication methods and displays to achieve the purpose of planned travel, saving time, avoiding congestion, optimizing paths, improving efficiency, and ensuring safety.

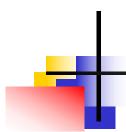
- ➤ Traffic incident induction
- >Meteorological environment change induction
- ➤ Queuing and congestion induction
- ➤ Road construction induction







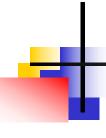




4. Network transmission system



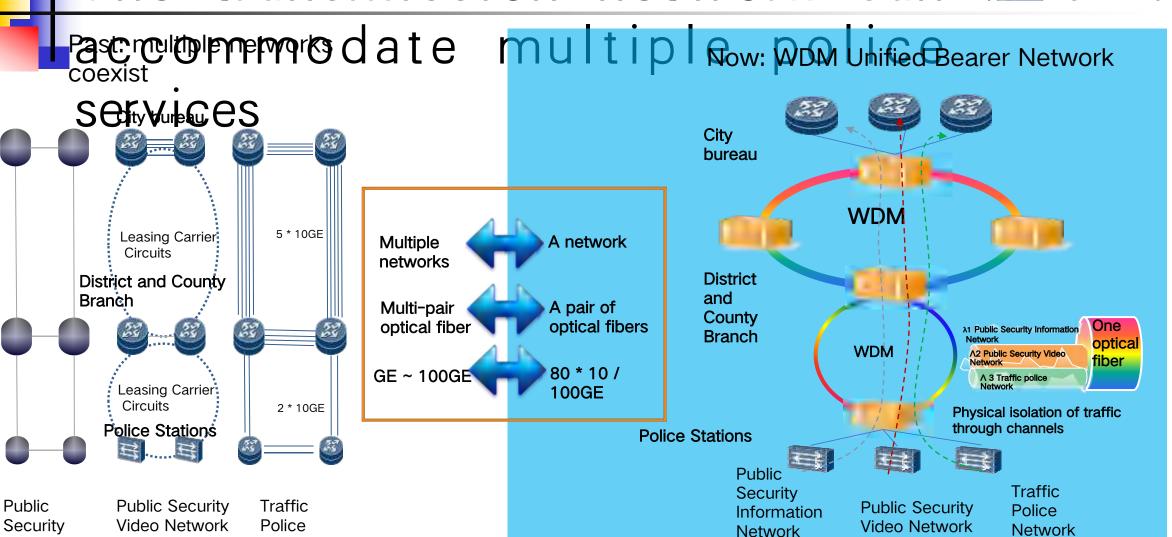
Brief comparison of video surveillance access solutions



	PON access	Switch access	Wireless access
Access bandwidth	1000M → 10G	Mainly 100M / 1000M	54M ~ 300M;
Coverage	20 km (can be extended)	Electrical interface 100 meters, optical interface can be extended	Hundreds of meters to several kilometers
Transmission performance	PON bandwidth isolation, no packet loss, no stall	Shared bandwidth easy to lag	Easy to be disturbed and unstable
Safety	Multiple authentication, data encryption, port isolation	Ports are not isolated with high security risk	Wireless listening, interference
Manageability	Natural cluster management to eliminate blind spots	Applying a large number of non-network switches brings blind spots	Complex management requires AC
Reliability	Passive equipment, multiple protections, stable and reliable	Active devices with relatively high failure rates	Affected by environmental factors
Resource consumption	Backbone fiber sharing; passive splitting at intermediate, power supply is not needed	Consumes more fiber, all nodes need to be powered	Need to occupy wireless frequency band resources, frequency band overlap may occur.
Cost performance	All equipment has high capacity, moderate cost and highest cost performance.	Unmanaged switches have low prices and poor capabilities; network managed switches have high capabilities and high prices	Low cost but unstable performance
Applicable scene	All the scenes	Suitable for situations where fiber resources are sufficient and there is power on the transmission line	Use in scenarios where wiring is not convenient

One transmission network can **阿爾斯**





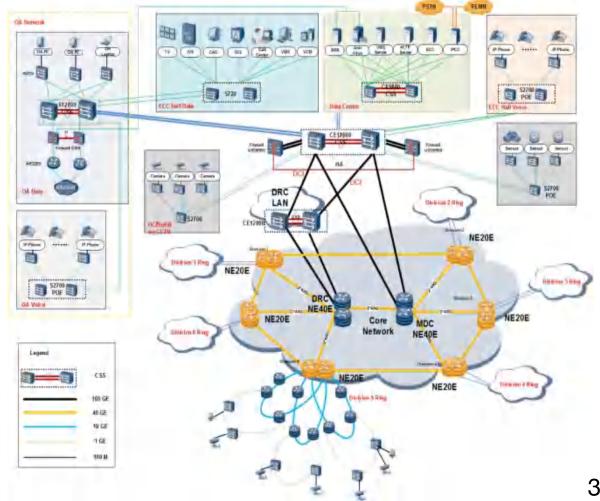
Information

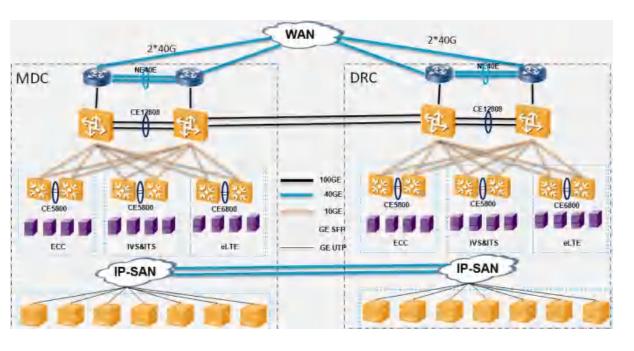
Network

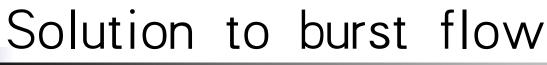
Network

Overall network architecture



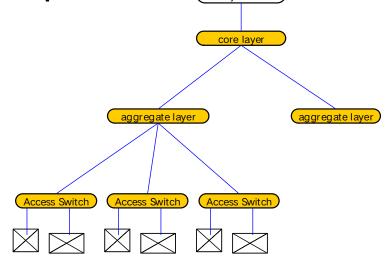








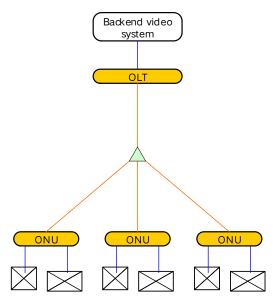




Switch solution:

- Deploy the CBR Settings
- Increase the reserved line bandwidth
- Increase the cache capacity of aggregation switches and core switches
- Open flow control

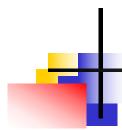
It can alleviate the impact of sudden flow superposition effect, but cannot solve the problem completely



PON access:

- ONU provides sufficient caching to support parallel access to multi-channel HD video
- The upstream bandwidth of ONU is TDMA time division multiplexing. The bandwidth between ONUs is completely isolated, and there is no traffic aggregation overlay effect in the intermediate link
- PON bandwidth is elastic bandwidth, which can be dynamically allocated based on DBA to ensure the bandwidth performance required by the video code stream while avoiding waste

In principle, PON access avoids the superposition effect of burst traffic



5. 4G LTE PTT cellular network telecommunications



Hytera P-LTE Solution Architecture



PSTN

Firewall & Internet



Application

Video/Voice Recording

IMS

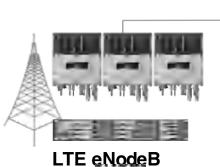




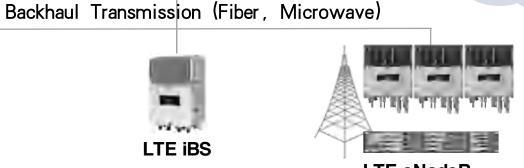
SmartOne Dispatching/Monitoring



Network







LTE eNodeB











EPC









LTE Vehicle Terminal

Chinese Experience

Scenario 1: Secured Comm. for Daily







Surveillance



Smart Dispatch









LTE Cellular Coverage





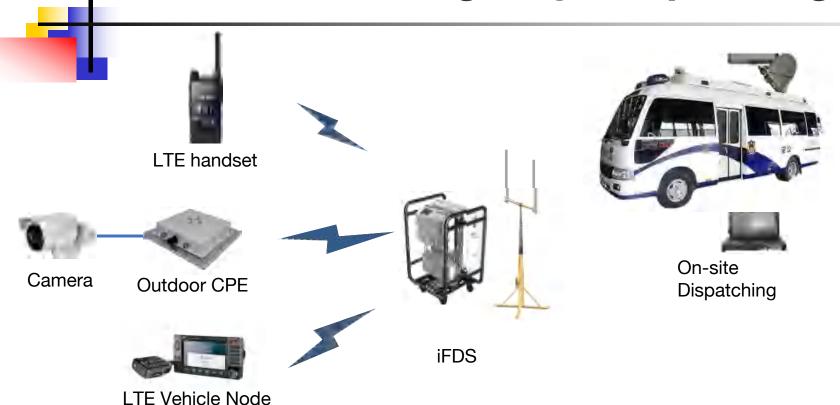


Field Operation

Scenario 2: Emergency Responding

Chinese Experience









VIP Escort

- High IntegrationeNB+EPC+MCS; Full LTE service
- Easy OperationPower on and ready to go!

- High Reliability IP66; MIL-STD-810G
- Flexible Deployment
 Outdoor portable / Vehicle mounted

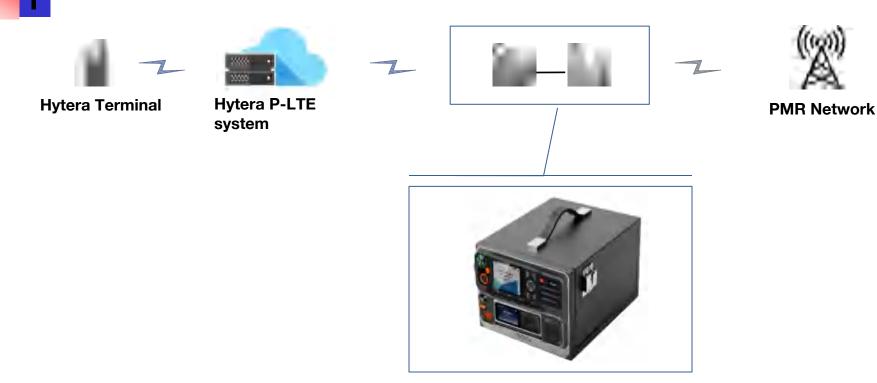


PMR Radio

Intehration with Legacy

PMR

operation



- Flexible Power Input: 12V DC or 220V AC
- Support DMR / TETRA / Analog network interconnection

Mixed group call between POC & DMR users

One-box design, high integration, easy deployment &



High Reliability





- Power Supply Redundancy
- Control Unit Redundancy
- Baseband Process Board Backup

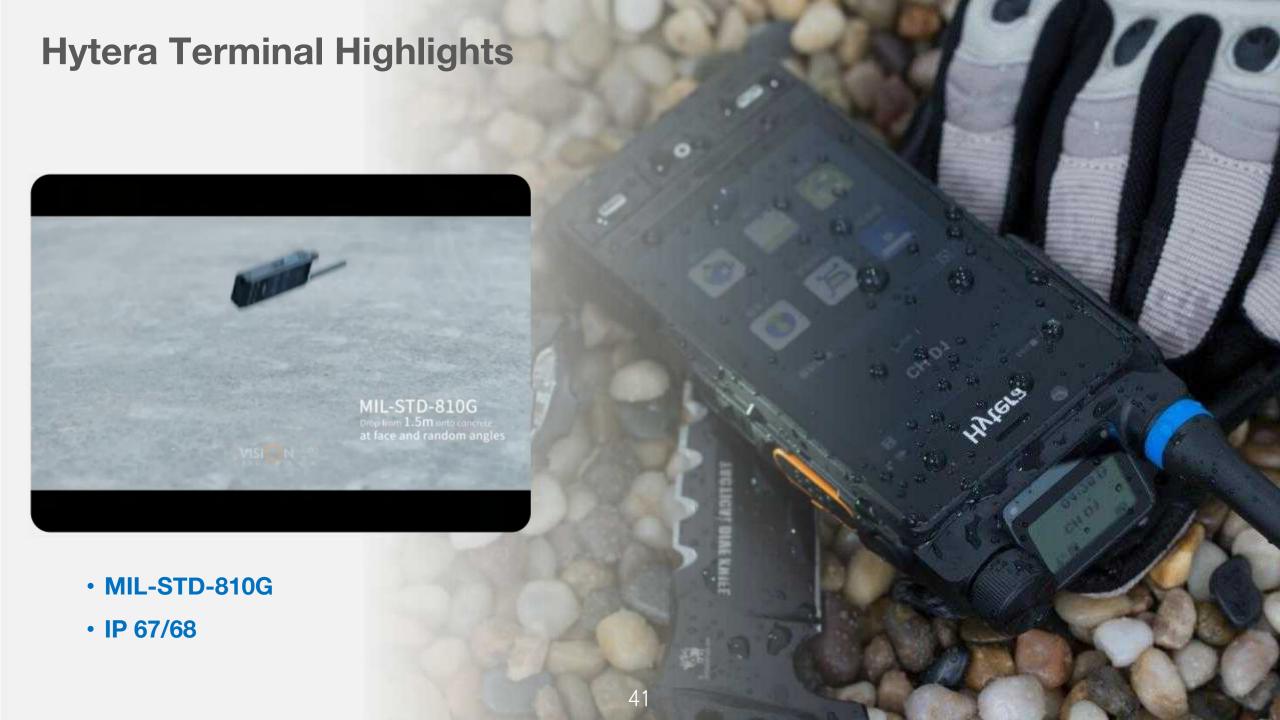


- Local Redundancy
- Geo-Redundancy
- Distributed Deployment

Tele-Grade 99.999% Availability

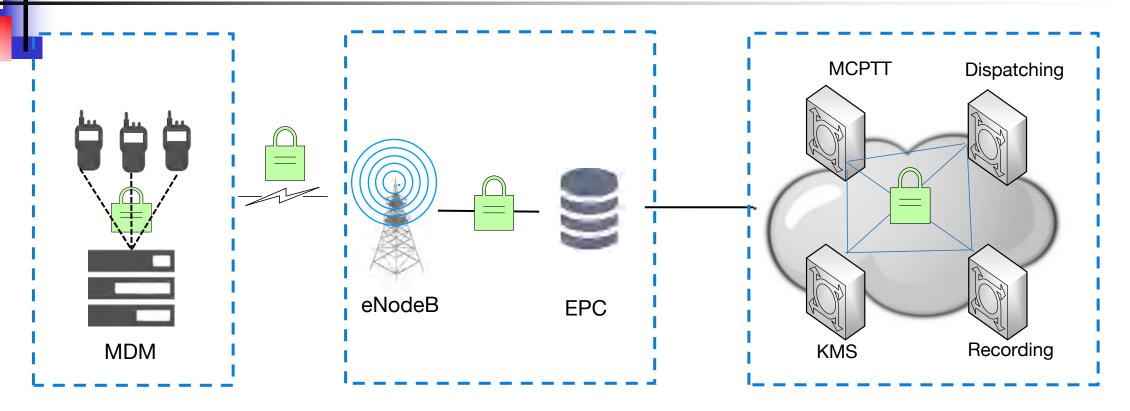
MTBF > 250,000 Hours

MTTR < 0.5 Hour



P-LTE Security Framework





Terminal Security

Level 1

LTE Network Security

Level 2

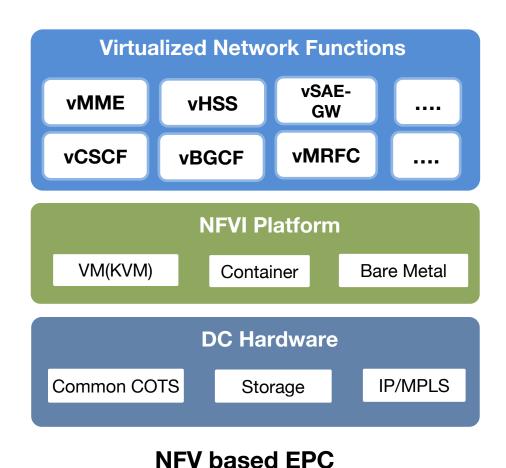
MCPTT Service Security

Level 3









SPECIFICATION Max Registered Max On-line Max Throughput Subscribers Subscribers 1000K 100K 40Gbps High Integrated Core, MME/xGW/HS'S/PCR Simple Deployment, Easy Extension High Performance over NFV Platform High Reliability, Geo Redundancy with Active-Active Mode

BBU5910M - 4G&5G Hybrid



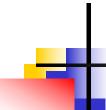


Highlights

- High capability: modular stack design, supports TD-LTE/LTE FDD/NR
- Large capacity: supports TD-LTE 3*20M / LTE FDD 3*20M,

 NR 8*100M 2TR/4*100M 4TR
- □ Supports 16 HUB,128 pRRU
- Highly integrated: 2U, 19"
- □ Synchronization modes: GPS, Beidou, 1588v2

Product Model		BBU5910M	
Dimension		88x442x338 mm	
Weight		11.5Kg	
Power Consumption		250W (NR 4*100M 2TR)	
Power Supply		-48V DC (-57V ~ -40V)	
	LTE TDD	3x20MHz	
Capacity (cell)	LTE FDD	3x20MHz	
(00.1)	NR	8×100M 2TR/4×100M 4TR	
Cell user number		RRC active user: 400 / cell	
Synchronization		Beidou / GPS / 1588v2	
MTBF		≥200,000 Hours	
MTTR		≤0.5 Hour	
Temperature		-5 °C ~ +55 °C	
Protection grade		IP31	







	Specifications
Frequency Band	Band 26
Antenna Configuration	2T2R / 2T4R
Bandwidth (MHz)	1.4 / 3 / 5 / 10 / 15 /20
Transmission Power	40W * 2
Sensitivity	≤-105dBm
Synchronization	GPS / GLONASS / BeiDou / 1588V2
Power	DC -48V ; Max. 500W
RRU IP Rating	IP65
Dimension (H*W*D)	435*340*157 (mm)

Multiple bandwidth supported

♦ Easy operation

Mission Critical PTT for Teams





PNC550



PNC560



MNC360

Mainstream Choice

5G Industrial Pioneer

Hytera Style in Vehicle

Innovative Convergence, Smooth Migration











PDC680 / PTC680

PDC760 / PTC760

Dual-mode POC + DMR Conventional

Multi-Mode POC + DMR Conventional & Trunking POC + TETRA



Body-worn Camera, Recording &



Collaboration



VM580D

- Basic model
- AES256 encryption
- Night vision
- Internal backup battery



VM750D

- Wide angle, 160 ° diagonal field of view
- Al face recognition
- Intelligent scene detection

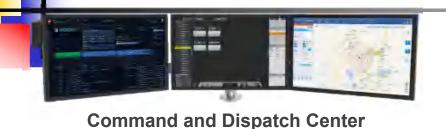


VM780

- Starlight night vision
- Gimbal camera system
- Rotatable lens
- Al face recognition

Critical Communication Services





MCPTT

- Full/half-Duplex Private Call
- **Emergency Private/Group Cal**
- Floor Control
- Call Forwarding



- Full/half-Duplex Video Private Call
- Video Group Call
- **Emergency Video Group Call**
- Video Push/Pull



PTT

Services

D

Video

Services



Emergency Call



MCDATA

- Point to Point SDS/MMS
- Point to Multipoint SDS/MMS
- Status Message

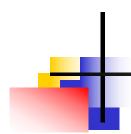
Dispatching

- Dynamic Group Number Assignment
- **Broadcast Call**
- Voice/Video Recording
- **GIS**
- Visual Dispatching
- Voice/video recording





End-to-End Complete 3GPP Mission Critical Service

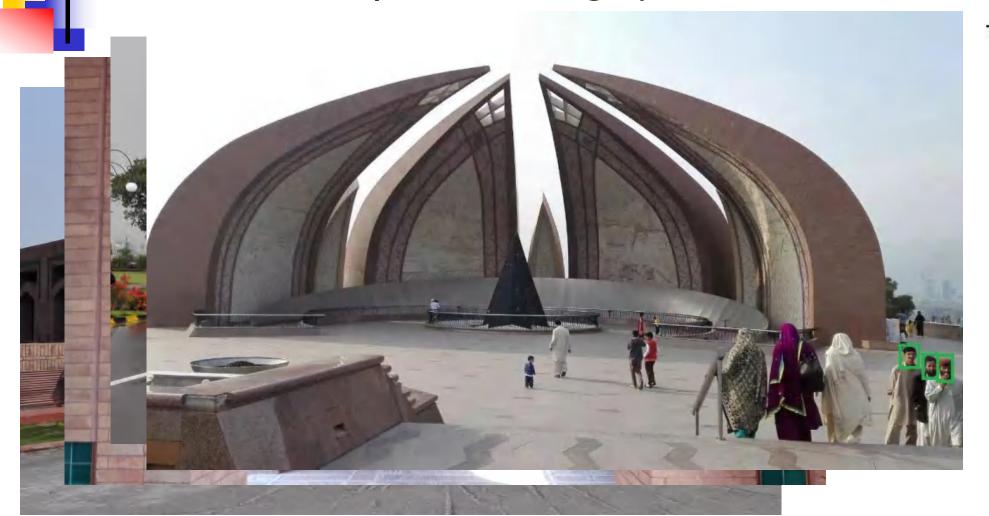


6. Public security anti-terrorism early warning system

Chinese Experience



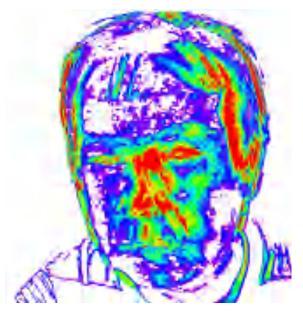
Public safety warning products



This is based on the latest hightech innovative technology products, Al intelligence system through image image analysis technology, vibration analysis can be real-time monitoring public personnel's psychological and emotional state, system can be in 1 ~ 3 seconds, the fastest will be able to quickly screen out in the crowd with terrorist violence tend to be suspicious of molecules, and automatically alarm prompt. In the suspicious elements before the implementation of violence, early warning, truly prevent the prevention of public safety.



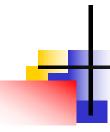
Based on the third generation of biostatistical analysis - the latest high-tech innovation technology



Vibration image analysis technology



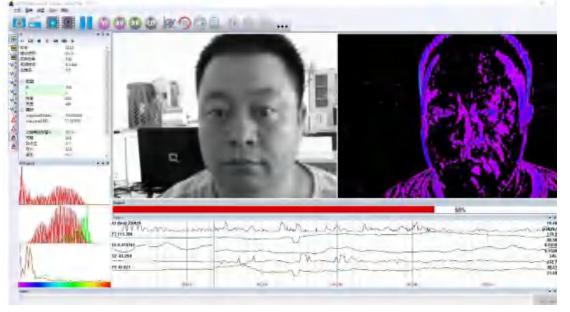
Technical means for intelligent analysis of people's potential psychological emotions



Technical realization method



Realize vibration image technology to analyze human body fretting and motion. When people are nervous, aggressive and anxious emotions can be obtained through the analysis of human fretting in the video. Physiological and psychological techniques show that there is a direct link between human behavior and body movement.



The danger and suspicion degree of the target is calculated comprehensively through four psychological emotion indexes: "aggression", "stress value", "tension" and "anxiety value". The higher the suspicion index is, the higher the danger level of the target is. When the target exceeds the preset threshold, the system will automatically give warning in various ways in advance. In the suspicious elements before the implementation of violence, early warning, truly prevent the prevention of public safety.

Public safety warning products (Security check application at mosque gate)

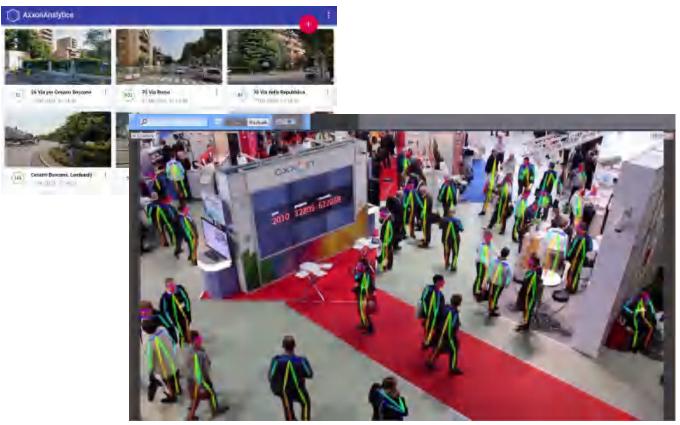








• Complete and rich AI functions to improve operation and management efficiency



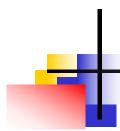
- Face recognition, face retrieval, image search
- License plate recognition, license plate retrieval
- Al smoke flame detection
- Al abnormal Behavior Analysis (skeletal analysis)
- Population statistics, queue management, heat map, age and gender analysis
- Video enrichment
- Video analysis rule retrieval





• Video concentration: Condense video across time and space for fast playback, and display objects and events captured at different times in the same screen







7. Police drones

Flight platform -- multi - rotor UAV







FZ-UAV-X1800

Product name	Six-rotor UAV X1800
Product type	FZ-UAV-X1800

Diagonal	≥1800mm
wheelbase	≥1800IIIII
Size after unwrapped	1912(W)mm×1800(D)mm×633(H)mm
Cruise duration	70min
Operating Radius	10km
Cruising speed	56km/h (15m/s)
Maximum flight altitude	5000m
Maximum wind resistance rating	7
Maximum rain resistance rating	8mm
Protection grade	IP54
Maximum takeoff weight	43kg
Maximum load weight	15kg
Intelligent battery	29000mAh
Satellite positioning module	GPS, Beidou, GLONASS
Hover precision	Horizontal: ± 0.2m, vertical: ± 0.5m
Mechanical characteristics of the arm	Pluggable
Blade mechanical characteristics	Quick release blade
Flight control	Multi-attitude flight modes such as fixed altitude, fixed point, autonomous cruise, one-button takeoff and landing, low voltage protection, automatic return, preset no-fly zone, electronic fence

Flight platform -- multi - rotor UAV

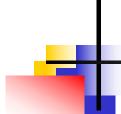






Product name	Six-rotor UAV X1550
Product type	FZ-UAV-X1550

Diagonal vheelbase	1501mm
Size after unwrapped	1640(W)mm×1425(D)mm×590(H)mm
Cruise duration	60min
Operating Radius	10km
Cruising speed	56km/h (15m/s)
Maximum flight altitude	5000m
Miximum wind resistance rating	8
Naximum rain rainstance rating	8mm
Protection grade	IP54
Maximum taleoff weight	24kg
Maximum load weight	10kg
ntelligent battery	29000mAh
Satellite positioning module	GPS, Beidou, GLONASS
Hover precision	Horizontal: ± 0.2m, vertical: ± 0.5m
Mechanical characteristics of the arm	Pluggable
Blade mechanical characteristics	Quick release blade
Flight control	Multi-attitude flight modes such as fixed altitude, fixed point, autonomous cruise, one-button takeoff and landing, low voltage protection, automatic return, preset no-fly zone, electronic fence



Functional module series -- common class





Universal PTZ assembly Hang multiple modules at once



4K zoom lens 30x optical zoom Fast 2D modeling



720P high clear heat imaging 60mm super focal length Support temperature alarm



120 dB horn Support the command center platform shout



4 Drop point cast Support each point to independently drop materials



600 meters of strong light lighting Support flash and other lighting modes

Functional module series -- feature class





Double light lens 40 times visible light 720P thermal imaging two-in-one



Gas detection lens 40 times visible light Real-time analysis of 6 gases



Laser fill lens 40 times visible light 1000m laser filling



Five eye lens Oblique photography 3 D modeling



Type 79 submachine gun

Gun pendant

95 Automatic rifle



Police multitube launcher Eight rounds of 38 mm Four 46mm submunition rounds



Police net gun Launch net Help to arrest



Fire extinguishing bomb launcher Forest fire extinguishing bomb Tall building fire extinguishing bomb

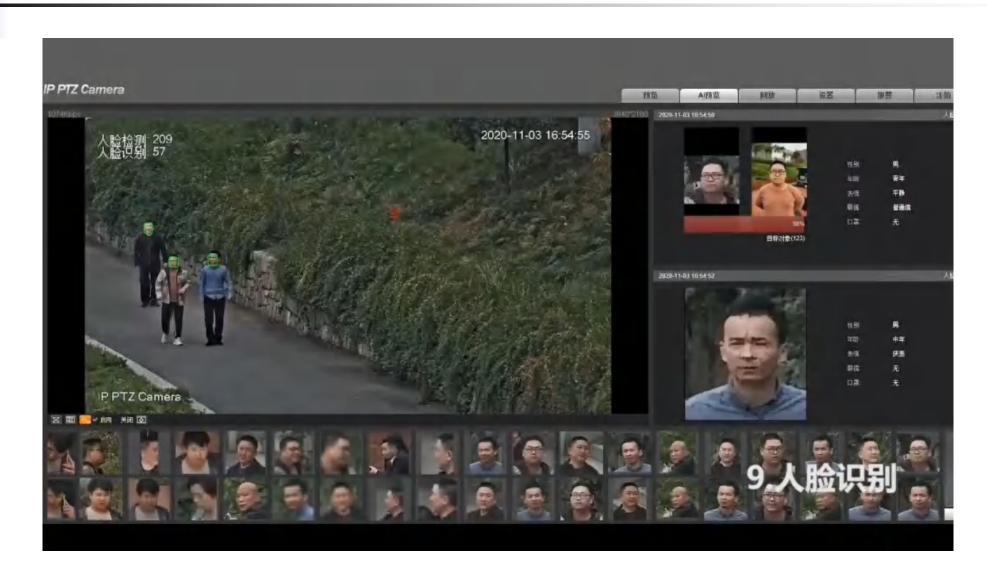


Jet fire tank Carbon dioxide Dry powder

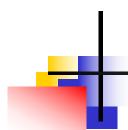


Video of UAV Products









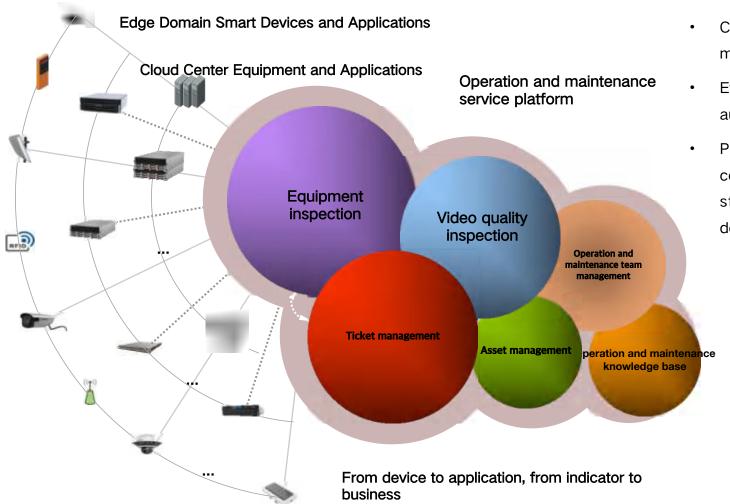
8. Operation and maintenance Management platform



Operation and maintenance



Lsystem design



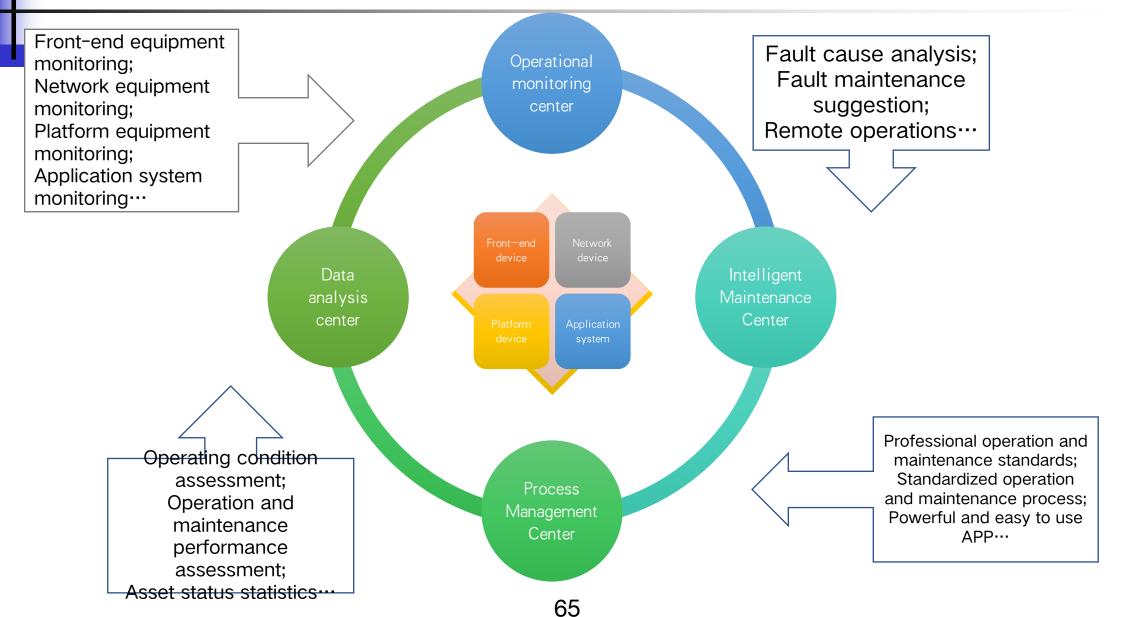
Quickly find faults, analyze and summarize faults, deal with them quickly, and ensure the quality of surveillance video

- Comprehensive monitoring from equipment to network, rich monitoring content, providing unified standards
- Efficient and intelligent automatic monitoring system, providing automatic fault monitoring and analysis
- Provide multi-dimensional integrated analysis to comprehensively grasp the operating status and maintenance status of all devices in the system's edge nodes, edge domains, and cloud centers

Chinese Experience

Intelligent O&M solutions





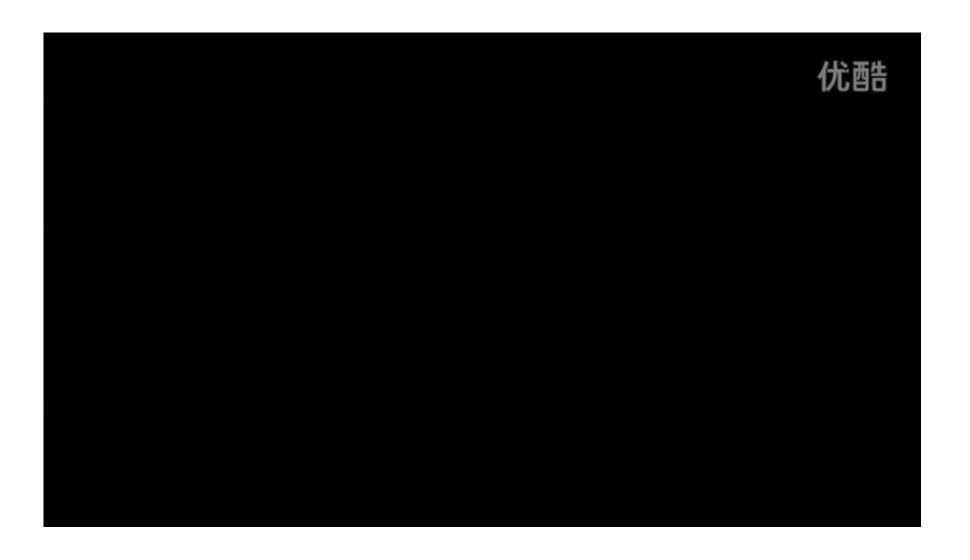


Unified O&M Portal, device online monitoring, system topology architecture, video status monitoring, Disk status monitoring, Host status monitoring, Asset maintenance management, Fault maintenance statistics

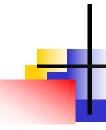


Future of smart public security



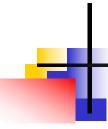






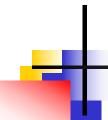


- 1. China's digital economy -- the meaning of innovation;
- 2. Digital economy in Guizhou; Big Data Expo;
- 3. Guiyang, Guizhou -- Digital Valley of China; Guiyang, Guizhou -- Base of Data in East and Calculation in West;
- 4. Guizhou's experience and Digital Silk Road.





- 5. From the emphasis on local functions to the overall efficiency of the system;
- 6. From valuing construction to valuing operation and maintenance;
- 7. From hardware to software;
- 8. Equipment manufacturers, communication operators, design institutes, system integrators;
- 9. Equipment manufacturer or system integrator?



Equipment manufacturer or system integrator?



Different roles and positions have their own different behavior and mindsets. For example, equipment manufacturers produce almost all their products on an assembly line basis and are characterized by standardization; communication link providers have a pattern of products (communication links) and services; system integrators produce each product -- system integration projects - that are ad hoc, unique and progressive in nature. If the role is misplaced or overstepped, it is inevitable that a little error may lead to a large discrepancy, unless the company completely and systematically changes its own organizational behavior and management mindset. This is why even when large equipment manufacturers are contracted for large system integration projects, they are not as entirely satisfactory as they should be, and even cause the projects to fail. There have been cases of this in China and also in Pakistan.

Where the ass is determines the head, which means location determines thought. Equipment manufacturers tend to be very large, even mega-enterprises, because of their assembly lines and scale. Because they are "big", the government considers them to be reliable and trusts them. As a result, these large equipment manufacturers become a natural priority for government departments to consult and approach. The salesmen of the large equipment manufacturers will take full advantage of these opportunities to maximise their corporate interests and to complete their own performance appraisals, guiding government customers (and consulting and design units) in the direction of their own products. The result is inevitably a pile of equipment, a high configuration, a waste of functions and funds, and a system with low cost performance. From the perspective of the system integrator, for each specific system integration project, it will balance the comprehensive configuration of each sub-system according to the actual needs of the customer and the financial budget, so as to facilitate project acceptance and delivery and achieve the best overall system cost performance. This in turn is one of the main differences between system integrators and product manufacturers.

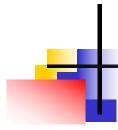




10. So-called "unique parameter";

Government Procurement Law of China requires:

- 1 There must be competition, at least three companies can meet bidding requirements;
- 2) If there are parameters only one brand can meet the requirement, they will be questiones and must be deleted and modified;
- 3 The price is not comparable; the price is unreasonable;
- 4 After-sales service quality is difficult to ensure;
- (5) Without compatibility, owners' interests will be easily damaged during system expansion and upgrade.





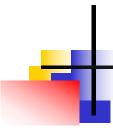
We will accelerate the digital development of trade, deepen the development of the Digital Silk Road, and foster a sound environment for international cooperation.

—— One of the eight tasks in "The 14th Five-Year Plan for Development of the Digital Economy"

In January 2022, The State Council of China issued "Opinions on Supporting Guizhou to Break new Ground in the Development of Western China in the New Era", supporting Guizhou to seize new opportunities in the implementation of digital economy strategy and build a digital economy development and innovation zone, supporting the development of digital trade, exploring the construction of Digital Silk Road international data port, focus on providing data services to countries along One Belt and Road."

We will make the public security prevention and control system smarter. We will strengthen the construction of the "Public Monitoring Project" and the big data platform for public security, deepen the application of digital means in national security, social stability, crime fighting and joint public order, and improve our ability to predict, forewarn and prevent various risks.

—— Guiding Opinions of The State Council on Strengthening the Construction of Digital Government, [2022] No.14 issued by State Council

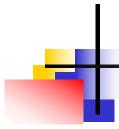




We fully support Xi Jinping's global development initiative in line with the principles of the United Nations. I think the global security initiative and the global development initiative are integrated with each other, and if there is global development, there will be global security, and if there is no global security, there will be no global development.

Pakistan still has relatively cheap labor, skilled labor, semi-skilled labor, Chinese technology and Chinese machinery, and joint ventures with Pakistani labor and Pakistani investment, which will be a win-win situation.

—— Shabazz Sharif (Pakistan Prime Minister) said on June 14, 2022

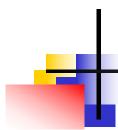


Fangzhou Technology's mission

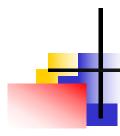


Fangzhou Technology's mission:

Bring China's best security products and best safe city solutions to Pakistan and contribute to a safe Pakistan.



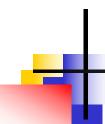
10. Acknowledgement





- 1. Lahore and Nankana Safe City projects won by Fangzhou Technology;
- 2. PSCA team is professional, dedicated and excellent;
- 3. Guizhou province is a park province, and Guiyang city is the "digital valley" in China;
- 4. Guizhou people and Fangzhou Technology welcome you







THANKS