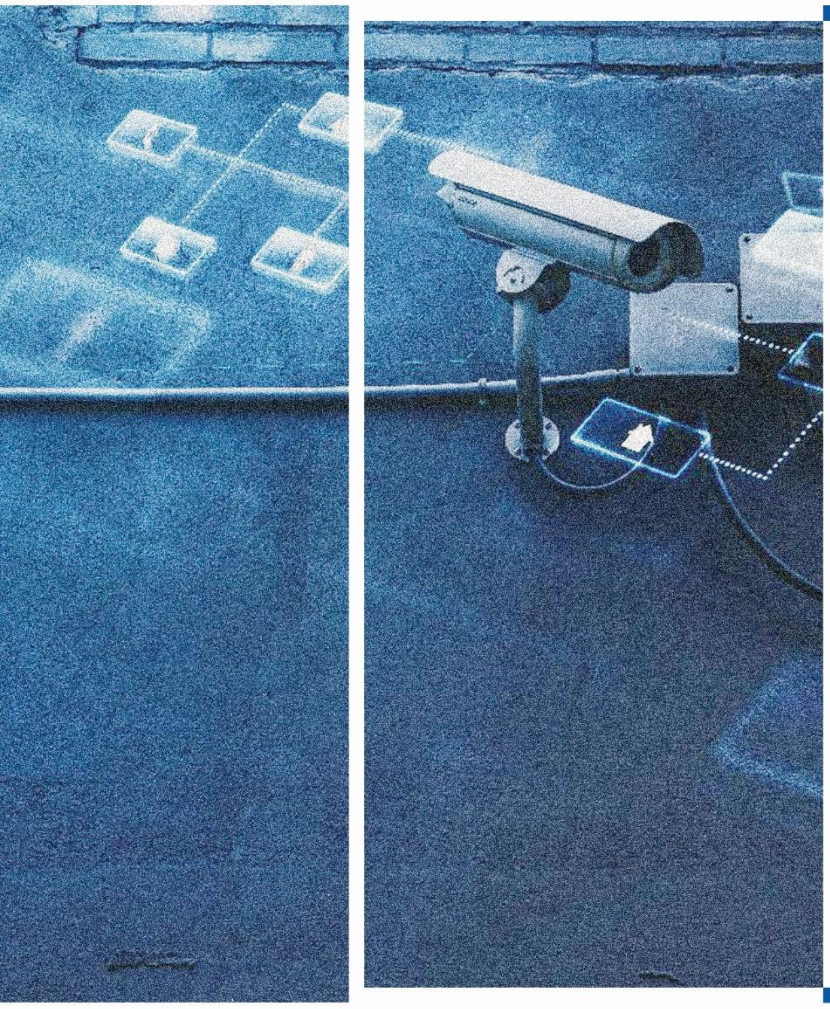


End-to-End

Intelligent Security Products and Solutions

MEGVII 旷视

About Megvii

Megvii(Face++) is a world's –leading builder of AI–Driven IoT(Internet of Things) , established in 2011. It is committed to creat maximum value for customers and communities with extraordinary technology. With the leading AI technology, Megvii empowers smart phones, CCTV cameras, robots and other sensing devices based on original AI algorithm , machines to understand our human world". Our business includes personal IoT, public IoT, and commercial IoT networks through a combination of software and hardware solutions. The company aims to provide cost–effectively and high–efficiently AI solution to benefit our human life.

Footprints

2011.10 Face++ established in Zhongguancun, Beijing.

2012 Millions of dollars of angel funding from Legend Star and Lenovo Capital.

2013.12 Became the first company in the world having won three world championships in face recognition.

2014 Millions of dollars of series A round funding from Sinovation Ventures.

2015.08 Launched MegBrain, the first deep learning engine in China.

2015 47 million dollars of series B round funding from Qiming Venture Partners and Sinovation Ventures.

2016.09 Upgraded Face++ Face Recognition Cloud Platform to Face++ AI Open Platform.

2017.02 Selected as one of the companies of 10 Breakthrough Technologies and one of the 50 Smartest Companies of the year by MIT Technology Review.

2017.03 Ranked No.1 in the List of China Unicorn Enterprises of the AI Field by Ministry of Science and Technology of China.

2017 460 million dollars of series C round investment strategically led by China's State Owned Capital Venture Capital Fund, Ant Financial and Foxconn Technology Group.

2017.10 Became the first Chinese company having won three world championships in visual recognition challenges on COCO and Places.

2018.04 Acquired Ares Robot as a wholly–owned subsidiary and started the intelligent robots business.

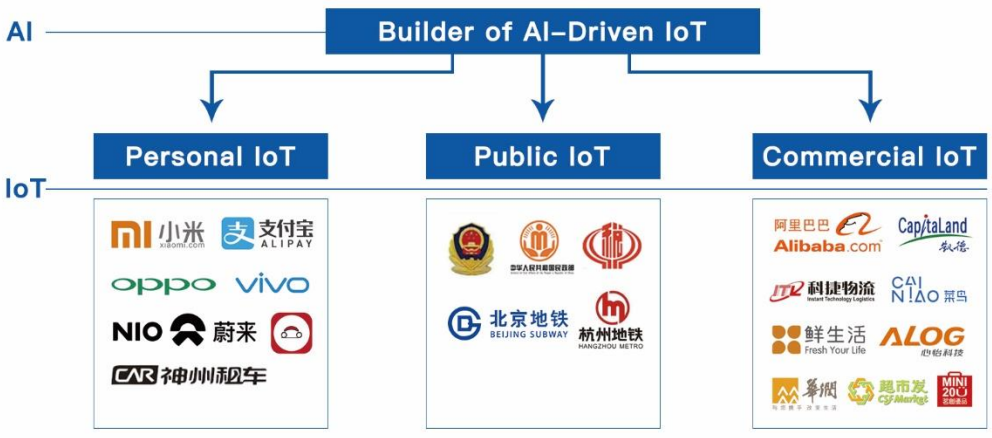
2018.07 3D structured light facial recognition solution applied on OPPO Find X model

AI+IoT

In 2015, Megvii launched original deep learning engine Brain++ . With comprehensive coverage of cloud, mobile and chip–side AI algorithms. Megvii's products and solutions have been widely used in finance, smart phones, security, real estates, logistics, retail, etc. Our customers include Alibaba, Ant Financial, Cainiao Network, Foxconn, Huawei, OPPO, vivo, Xiaomi, Lenovo, Silk Street, Miniso, CapitaLand and other leading enterprises. Megvii also provides services to Ministry of Public Security, the State Administration of Taxation, China CITIC Bank, China Merchants Bank, China Life, other government departments, stated owned enterprises and institutions.

In 2017, Megvii's Face Scan Payment technology was selected as Top Ten Breakthrough Technologies in the World. In June of 2017, Megvii was selected as one of the 50 most intelligent companies in the world.

Builder of AI–Driven IoT



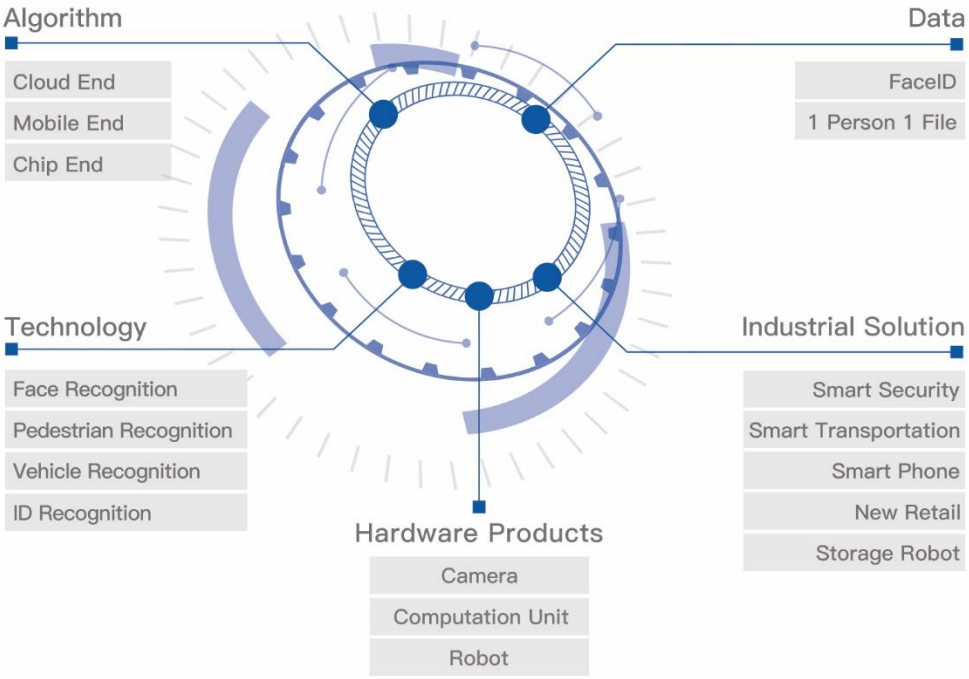
Technologies and Talents

With original deep learning engine Brain++, , Megvii AI algorithm capabilities which comprehensively cover the cloud (ResNet), end (ShuffleNet), core (DorefaNet) and technical engineering strong capabilities. The company participates in the formulation of 19 artificial intelligence national and industry standards in China. Within the seven years since its establishment, Megvii has competed with giant companys such as Google, Facebook and Microsoft in various international artificial intelligence top competitions, and won the first place in 25 world technical evaluations.

In January of 2019, Megvii has more than 2000 employees, right now it is one of the most representative AI companies in China. After 7 years of rapid development, Megvii holds more than 900 patents, has won more than 70 world-class Olympic gold medals. Megvii has competed with giant company such as Google, Facebook and Microsoft in various international artificial intelligence top competitions, and won 25 the first place in international AI Tech benchmark championships, including MS COCO, Places and Mapillary. The company has four R&D centers in Beijing, Nanjing, Chengdu, Shanghai in China, and global R&D center in Seattle, USA.

End-to-end intelligent security products and solutions

As one of the earliest artificial intelligence companies which involve in the security field , Megvii provides end-to-end solutions that covers the entire business process including "algorithms, data, hardware products and , solutions" ,which service the typical scenes in the security business and the actual demands , assist public security users to build a new intelligent security closed-loop system includes "front end awareness, cloud research & judgment and , terminal application".



"Software & Hardware " AI empowers the cloud, the end and the chips to make devices smarter

Empowering the cloud, the end, the chips with the one-stop deep learning engine Brain++, as well as AI algorithms ResNet (cloud), ShuffleNet (end), DorefaNet (chips) , Megvii makes devices smarter. Based on the original technology advantages, Megvii could customize and optimize .solutions more easily.

"Cloud + to End AI" The collaborative computing of cloud and end can improve computation efficiency and reduce costs significantly

Based on the analysis of the cloud video stream, the computation is moved forward, and the AI algorithm is "written" into the chip to form a smart module, which is mounted on the surveillance camera to enable it to have capture or recognition function, this will help to reduce bandwidth cost significantly , cloud decoding and analysis load will more efficient and accurate.

"End-to-End Deliver " Build new security business closed-loop system

Megvii provides end-to-end smart security solution with the entire business process based on user's requirements. The company builds AI & +IoT system of intelligent security to meet customer's needs by using closed-loop security of front-end awareness, cloud analysis , and terminal applications".

“Cloud”— Insight Surveillance System

Application class (SAAS)

Face Recognition application platform

Insight Surveillance System with Megvii’s original algorithm and platform, to analyze the people’s portraits & features in massive videos and pictures ,so as to provide the police with image analysis through massive face data and model materials.

Features

Dynamic Portrait Checkpoint

This platform could automatically identify the passers on the video screen in the city-level population database , and send an alarm to the police when it is necessary.

Historical Alarm

Real Time Alerts

Static Searching Function

Based on permanent resident population database, transient population database, historical videos and pictures, this platform provide the interface to compare real-time information with the existing billion-level database and feedback comparison results in seconds, providing big data query for the public security department.

Portrait Comparison

Single Retrieval

Research & Analysis Tool

Using the algorithm model of graph detection and the fuzzy image search technology, the target range of suspects can be easily identified. This platform helps public security departments establish a new police mode to improve the efficiency of cracking cases.

Research & Judgement Tools – Map

Study Tools – Videos

One File Per Person

According to the facial features, this platform forms a portrait information file by aggregating portraits of the same person captured at different times and in different locations from the massive captured images.

One File Per Person

Track Playback

“Panoramic” Display

By displaying the fusion of traditional surveillance videos with PGIS system and the three-dimensional structure map. This platform could help the police target and track criminal suspects easily.

Multi-Dimensional Sensing Access

This platform can support the access of capture machine that can receive information in real time, Portable Portrait Comparison System, Certificate & Holder Consistency Check Machine, MegBox, smart glasses, police assistant, data distribution system and face & identity information collected by the database. It can also gather massive portraits, personal data, support the 1:N search of billion-level capture data and provids track information of suspicious persons.

■ Multi-level portrait system interconnection

The portrait data can be uploaded and downloaded, and shared with the portrait system of other areas. So as to achieve multi-level sharing applications such as deployment control alarm and cross-region data query.

Performance Index

- 50000 channels city-level analysis architecture
- High-density hardware architecture, support up to 128 channels of video stream resolution
- Second-level response to the 1:N search of 2 billion portraits
- The stand-alone can support a warehousing speed of 400 sheets / sec
- 70 million stand-alone passers-by database capacity , 2 billion cluster passer database data

Video Structuring Application Platform

The video structuring platform use Megvii original AI recognition algorithm for face, -body and- vehicle, as well as the industry-leading ReID recognition algorithm, this will perform structuring analysis for faces, human body, cars and some special flags. The platform provides such research, judgment and analysis tools including image search, drawing search and real-time trajectory tracking . The platform also has visual operation and maintenance functions, and unified authority management function, these functions will help users to extract and identify key information in massive video and image data quickly.

Features:

■ Online Structuring Analysis

This system could manage smart cameras,it provides interface to perform the detection, tracking and attribute analysis of faces, human bodies and vehicles in the video stream, and output structuring data that meets the definition of industry standards.

■ Offline Structuring Analysis

To perform upload and analysis of massive video/picture files. it provides interface to perform the detection tracking and attribute analysis of faces, human bodies and vehicles in the video stream, and eventually output structured data that meets the definition of industry standards.

Video Structuring

Homepage Map

■ Re-Identification

This platform provides industry-leading Re-Identification pedestrian/vehicle identification algorithms, which aims at providing powerful algorithmic support for applications such as human and vehicle mapping, cross-camera target tracking and so on.

■ Face-Vehicle Association Query

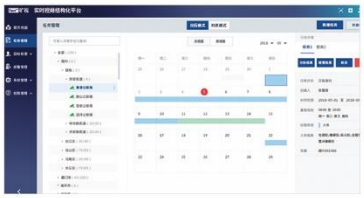
This platform provides ID binding of the vehicle & the front passenger's face in a typical monitoring scene, so that the related checking vehicles by faces and checking faces by vehicles is realized.

Face-Vehicle Association

Drawing Search

■ Visual Operation and Maintenance

The platform supports real-time monitoring and warning of the status of hardware in each node and the system core service, as well as dynamic visualization display.



Task Management

Operation and Maintenance Analysis

Drawing Search

The platform provides a set of portrait tools that meet the operational habits and requirements of the police. Including portrait search function which can be used in the image search and cross-camera target tracking. Users can flexibly and freely search for people with details such as clothing styles, colors, LOGOs and striped backpacks. At last, the trajectory of its results will be displayed on the map based on time and space information.

Task Calendar

The task calendar management mode supports time-sharing scheduling mechanism for different tasks based on cameras, which assists users in maximizing the use of computing resources and achieves refined presentation and management in calendar mode.

System Compatibility

Seamlessly compatible with major manufacturers' ' video surveillance platforms, such as milestone, etc.

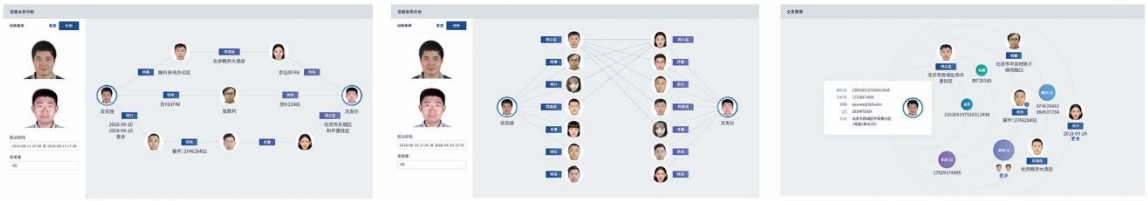
Video Big Data Application Platform

Megvii's video big data platform based on neural network machine learning and big data technology. Through the analysis of multidimensional data such as people, cars, and objects in videos, pictures, and events, it can analyze trajectories, labels and the relationship between people and objects. This system is widely used in positioning suspects, conducting early warnings on key population and places to extract the deep value of data, and serving the public security.

Features:

Holographic Achieve

Through the data analysis and in-depth mining of the big data platform, the human-centered display includes a full range of archival information such as major social relationships, assets, peers, MAC&IMEI, etc., which provides rich data associations for the police.



Fuzzy Search

Fuzzy search of all data types supports the attributes and image retrieval faces, human bodies and vehicles , the results show all the relevant information of the target . Including basic information (human static port information, vehicle registration information), dynamic information (passers, passing car), file information (Linking one file per person, one file per car), and the results of the relationship of all information files.

Data Monitoring

Access monitoring: face data, portrait data, vehicle system data, from the police and business systems;

Operational monitoring: real-time monitoring and display of the operating status of systems that provide data;

Data resource monitoring: The system can monitor the local raw data and result data and the third party system data that can be called remotely.

Performance Index

- More than 100 kinds of people, cars, and related technical methods
- Able to identify more than 2,000 logos and models
- Second-level respond to tens of billions of structuring data

Platform Class (PAAS)

Face Capture & Recognition Engine (MegFace)

Portrait Comparison

Single Search

The MegFace face capture recognition engine combines multiple algorithm models such as face detection, tracking, recognition, quality and attribute judgment, which can automatically select the highest quality frame in multiple frames, then perform feature extraction and recognition comparison.

Performance Index

- Face detection rate >99%,Frontal face rate >99%;
- In the case of 10 million underlying database, the query return time is less than 500 milliseconds;
- The correct reporting rate is >99%, the gender identification rate ≧ 99%, and the face age detection rate ≧99%;

Video Structuring Analysis Engine (MegVideo)

Face-car association

Video structuring

The MegVideo video structuring analysis engine integrates multiple algorithm models such as person/vehicle/specific identification/specific behavior detection, person/car ReID, person/car quality judgment, and person/vehicle attribute judgment. It can select the highest quality frame in multiple frames automatically. MegVideo supports both offline and real-time video structuring analysis, and also the cross-camera tracking and recognition of people and vehicles.

Performance Indicators

- The detection rate of people and vehicles is greater than 95%;
- The detection rate of the vehicle and vehicle property is greater than 98%;

Large Database Clustering Search Engine (MegSearch)

MegSearch large database clustering search engine uses Megvii original feature value layered index, layer-by-layer progressive, refined comparison technique, transforming linear collisions into layered comparisons, greatly improving the performance of search clustering. In the case of a stand-alone with 10 million underlying database, the query return time is less than one second..

Video Big Data Analytics Engine

The video big data analysis engine (MegData) combines AI algorithm and big data technology to support massive images, features, attribute data of faces, figures and vehicles, and retrieval, clustering, and collision between related structured and unstructured data, thus effectively supporting one file per face, one file per person, one file per car, face -person- car file association and various technical methods. The stand-alone machine can support the 10-million-level new faces, figures, and vehicles clustering archives.

Deep Learning Engine (MegBrain)

Megvii launched the original deep learning platform Brain++, the core of it is the deep learning engine MegBrain. Which plays an important role in supporting the training and implementing reasoning of the algorithm model. It is widely used in the training and deployment of Megvii's original algorithm model , and is applicable to different platforms such as cloud, end and chips. Through independent research and development of full-stack deep learning, MegBrain's running speed and resource consumption are significantly better than Teserflow released by Google.

Resources (IAAS)

Megvii's self-developed server resource series products have been specially designed and optimized for each typical security scene. It enables the CPU, GPU and other computing resources to be optimally scheduled, so that the AI algorithm can get the best performance, which can choose different combinations for different access types (video stream, snapshot stream, view database, etc.), different access road scales, different functional modules (static comparison, dynamic capture, research & judgement analysis, video structuring, video big data, etc.), different network topologies (video network, public security network, government network, Internet, etc.) to meet business needs and achieve the best cost performance.

- MS3000 Series: Business Server
- FS3000 Series: High-Density Retrieval Server
- CS3000 Series: Parsing Server
- SR3000 Series: High-Density Storage Server
- CP3000 Series: High-Density Resolution Server
- CT3000 Series: Video Big Data Server
- SS3000 series: High-Density All-In-One Server

“End ” “Meg Eye” super-sensing smart camera series

“Min Guan” super-sensing intelligent capture camera MegEye C3S series

Internally installed smart chip, equipped with sinister original intelligent algorithm, MegEye-C3S can take a full-frame and whole-picture shot of face. It is widely used in various types of bayonet and the scene to realize accurate face capture at high-density flow card bayonet, up to 105 faces in a single frame.

“Meg Eye” super-sensing intelligent recognition camera MegEye-C3R series

Equipped with a squint depth learning face detection algorithm, MegEye-C3R can realize real-time comparison recognition of up to 50,000 face database at the front end, and output capture information of face attributes such as age and gender at the same time. Users can set capture apps or compare apps flexibly. This series of products can be used in black and white list applications, and is widely used in application scenarios such as important card slots, factory parks, and commercial locations.

“Meg-eye” super-sensing intelligent fully structuring camera MegEye-C4N series

The MegEye-C4N series is a newly developed intelligent fully structuring camera based on the deep accumulation of the industry and equipped with high-performance embedded computing chips. This product serves the safe and secure business application of Safe City. It is especially suitable for application scenarios such as pedestrian traffic intersection, street roadside monitoring, and community monitoring, or a wide range of portrait bayonet scenes ,aiming at achieving accurate capture and real-time structuring analysis of moving objects in the scene.

“End” – Equipment Terminal Series

ID Verification Desktop

ID verification desktop is an intelligent equipment with face recognition algorithm as core technology. It verifies whether an ID card holder is the real owner or not. The product has a built-in second-generation ID card reader module which is certified and authorized by the public security organ. While reading the identity information of the holder, the machine can initiate the HD camera to capture the on-site holder’s face, and calls the local recognition algorithm module to compare with the photo in the ID card at a fast speed, thereby verifying both the holder and the card. The product has a built-in living detection system to effectively prevent photo attacks. With built-in high-speed photographic apparatus and OCR text/image recognition algorithm, the product can effectively identify non-chip documents.

Features

- Use Face++ latest face detection and recognition model, capture human faces, judge the quality of faces , compare and recognize faces accurately;
- The verification speed of the witness certificate is less than 1 second, the stand-alone mode is supported, and the 1:1 comparison can be completed locally;
- The correct rate of verification is not less than 98%;
- Internally installed infrared liveliness module, automatically realize live detection, anti-photo and video deception;
- Has a built-in living detection system to effectively prevent photo attacks
- Support downloading advertisement, and advertisement scrolling;

Application Scenario

Three stations (train station, bus station, rail transit station and airport), hotel accommodation, education exams, Internet cafes, government service windows, intelligent buildings, etc.

Rapid Deployment Kit

The Rapid Deployment Kit integrates a dedicated camera for portrait recognition, a camera stand, a portrait recognition host, and a wireless network module to form a portrait comparison system that can be quickly deployed, flexibly used, and portably moved. The product supports face recognition comparison, underlying database management, portrait retrieval, map search, real-time monitoring, video playback and other functions. Can be widely used in public security criminal investigation, technical investigation, map investigation, public security, security, customs inspection and other business directions.

Features

- **5 minutes rapid deployment**
  The network is set up while the system is powered on ,no need for any network settings, APP applications, or system configuration.
- **Support remote concealed detection**
  The recognition distance can reach 50 meters, the wireless communication distance between the camera and the host can reach 150 meters, and the monitoring is more concealed.
- **Record the police mission**
  The video is turned on while the system is powered on, and the 500-hour recording ensures all-time record of the police mission, all alarm events are displayed since the intelligent video playback timeline is visible.
- **Easier to get into the database**
  Visual navigation design, click the mouse to complete the warehousing, support file name, automatic resolution of ID card.

Smart Glasses

Smart glasses is a smart wearable product in the form of glasses and head-mounted hardware. Smart glasses are linked with the handhold terminal APP to solve the problem of accurate identification and blacklist comparison & alarm in the near-mid scene. This product creates a new law enforcement experience for users, guarantees the first perspective of real scene, releasing police officers' hands and improving police productivity.

Features

- **Various product forms, diverse connection modes, meet different scene needs**
- **Distributed architecture design, driven by autonomous algorithms, bless with big data analysis, provide rich face data value output.**
- **Front-end construction, global coverage, enhance the flexibility and mobility of the city security monitoring system**
- **Photo capture, push pictures, keep fresh data , make the data more effective for technical application.**
- **Prevention & control on cloud, collaboration on cloud, ensure accurate strikes on suspicious people**
- **Adapt to a variety of network environments, support traversing network isolation devices, and ensure the security of public security networks.**

"End" – Other Smart Terminals

Smart MegBox Series

MegBox is a hardware computing device based on the AI face detection algorithm to capture human faces and analyze attributes. It can support up to 16 channels of video analysis, while its up-front intelligent computing can realize system solutions for face capture and attribute analysis. Meeting hidden installation needs. This product meets the needs of concealed installation and mainly used for camera upgrade, comprehensive treatment, vehicle, security, commercial or traffic scenes.

Features

- **25fps frame-by-frame detection, capture faces in 0.04 seconds**
- **High concurrency detection, capture >30 faces in single frame**
- **Analyze attributes of face ,gender and age**
- **Optimize background map pushing, configurable background large image compression and push strategy, greatly reduce bandwidth and storage**
- **Compatible with vehicle wide voltage range and shock absorption structure**
- **Image can be obtained through SDK, FTP, IE browser in multiple ways, conveniently dock background business system**
- **Small size, easy to be installed covertly**

Smart NVR

MegNVR-N8 series NVR adopts high-performance processor and embedded Linux operating system, embedded advanced deep learning algorithm, integrated IPC access and management, video storage and forwarding, alarm management, image intelligence analysis, face matching and many other functions. Accurately realizing the capturing, modeling, comparison, retrieval and other features of the face, this product widely is used in public security, transportation, schools, shops, telecommunications, supermarkets, hotels, factories and many other places.

Package product – Integrated Access Platform

Iot Access Platform

This platform is used to access various video streaming cameras, capture machines, video libraries, etc. for video analysis, capture recognition and so on. It supports GB/28181 standard, GA1400 standard, support SDK of mainstream video manufacturers;

OpenApi Integration Platform

This platform is used to support each intelligent security ecosystem built by partner, providing them with portrait comparison, portrait capture, portrait control, video structuring analysis and other interfaces to create better business experience and business value for users;

Value -Added Business Products

Police Assistant

The "Insight" Police Assistant APP makes full use of computer vision technology, face detection technology and face recognition technology to model and compare offenders' faces. This APP can also receive real-time alarm information to assist the criminal investigation department to determine the identity of the suspect, so as to prevent illegal crimes and foreign criminals who evade verification by falsely reporting their names and identities. This greatly improves the efficiency of the public security department and crack down on the strength of criminals.

Features

- Scan face to log in: millisecond-level face recognition login, faster and more efficiency.
- Combination of the police and information: real-time dynamic alarm link with mobile phone, check real-time alarm conditions instantly.
- Portrait retrieval: Query personnel comprehensive information
- Verification of the witness certificate: Use OCR to identify ID card information for verification.

- Application of multi-user complex scenarios: subway capture, suspects verification, social escape, emergency command and dispatch, personnel information collection
- Automatically search for risky conditions, automatically matched the receiving end: automatically match the information according to the location of conditions and the territorial principle to officers, then push it to the mobile phone of the police in the jurisdiction. There is no need to discriminate manually .
- Adapt to multiple network environments: support public network deployment, video private network deployment, Internet deployment, and deployment of multiple different networks. Support traverse network isolation devices and ensure the security of public security networks.
- The industry's leading original algorithm: self-original deep learning engine kernel Brain++. The only self-developed underlying platform technology in China which integrates algorithms, data and training.
- The entrance of all applications of faces : Support all kinds of face application systems, static retrieval system, dynamic portrait bayonet. Support 1:1, 1:N, image search, dynamic alarm.
- Second-level response and return: the image upload system has a second-level response, and multiple results are received in seconds.

Megvii Technology Co.,Ltd

Product consultation hotline：400-6700-866
Service hotline：400-6060-004
www.megvii.com
business@megvii.com
3rd Floor, Tower A, No.2 Kexueyuan South Rd, Beijing