What You See

What You Get

AI + Public Services

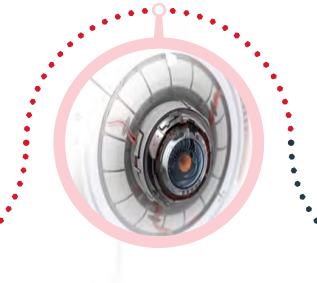
SENSETIME

www.sensetime.com

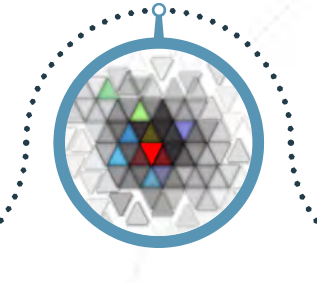
Core Technologies

Facial & Gesture Recognition
- Identity Verification
- FaceID
- Key Point Locating

Image and Video Processing Enhancement
- Super-Resolution
- Single-Photo HDR
- Filter Effects

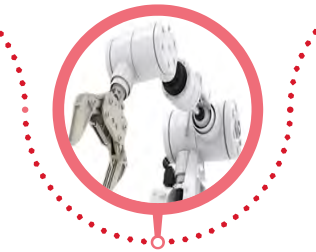


Massive Video Understanding and Mining
- Video Content Analysis
- Video Content Structuralization

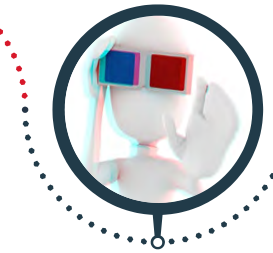


Generic and Customized Image Recognition
- Scene Recognition
- Satellite Image Analysis

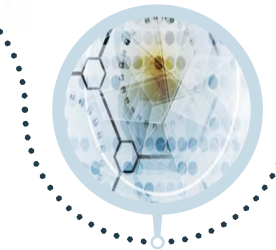
Medical Image Analysis
- Lesion Detection and Localization
- Matching of Multi-modal Data



Robot Control and Sensing
- Vision-driven Robotic Arm for Object Operation Random Bin Picking Guided by 3D Vision



SLAM and 3D Vision
- Real Time Dense 3D Reconstruction
- Light Cross-Platform AR/VR Engine

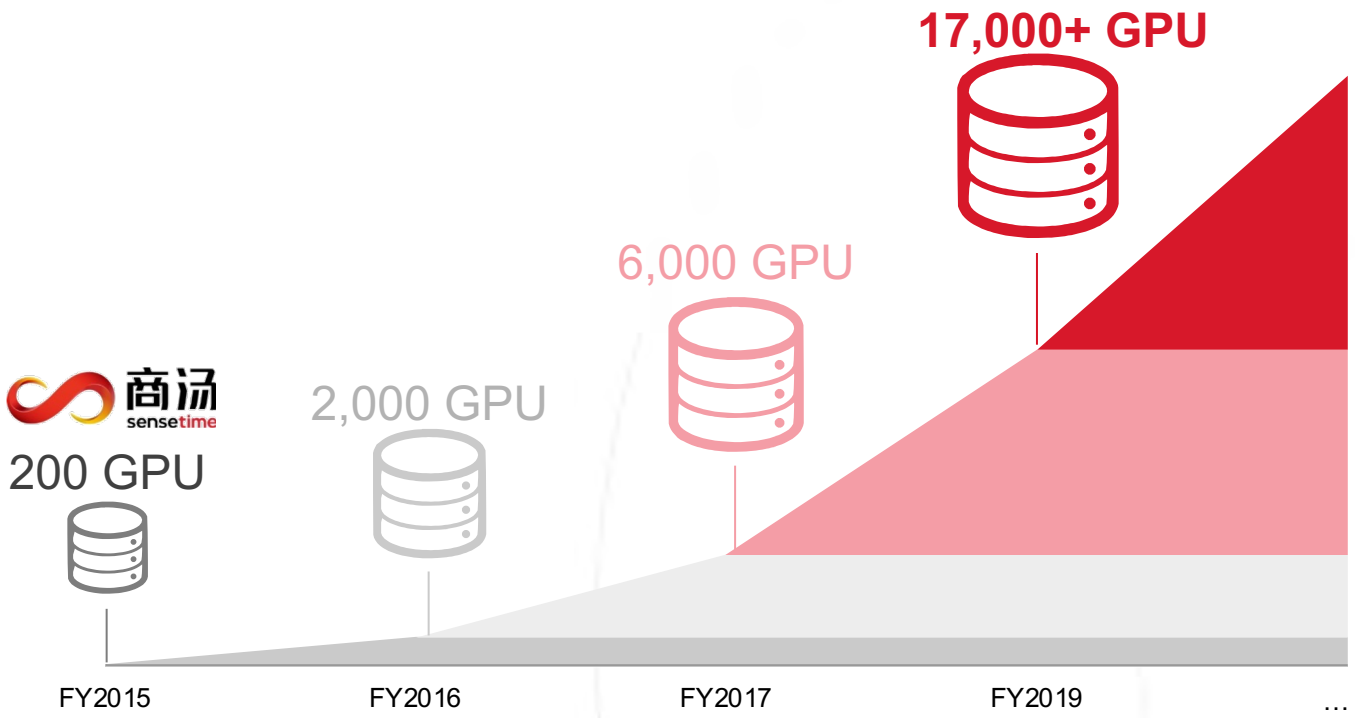


Deep Learning Platform
- AI High Performance Storage
- High Performance Heterogeneous Computing

Autonomous Driving
- Pedestrian and Vehicle Detection
- Model Deployment Based on FPGA Platform

Computing Power: Privately Owned AI Supercomputing Power

SenseTime's Fast Evolution of GPU Supercomputing Cluster



Supports Distributed Training

100bns of big data model

10bns of training samples

…with Strategically Selected Locations

17,000+ pieces of GPUs, **19** GPU clusters, maximum connections of **2,024** pieces of GPUs

400 PFLOPS
Per PF computing speed
Summit
(#1 Globally)

202 PFLOPS
Per PF computing speed
SenseTime

125 PFLOPS
Per PF computing speed
Sunway Taihu Light
(#1 in China)

SenseRemote – Environment Protection & Hazard Prevention

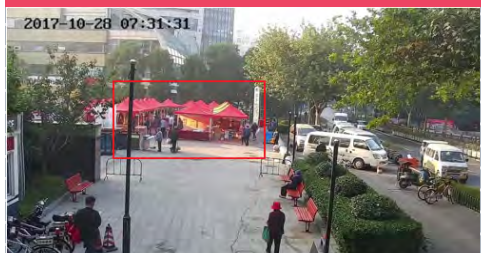
AI for Better Society | City Visual Analytics Platform

AI for Better Society | AI + Smart City

Urban Management

Garbage Detection
keeping city clean & tidy

Urban Management



Illegal Road Occupation Detection

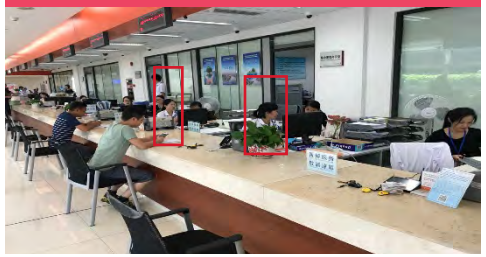
Urban Management

Illegal Parking Detection
ensure pedestrian safety

Urban Management

Dangerous Objects Detection
ensure road safety

Smart Governance



Self-service, Personal Recognition
Smart Office

Fire Detection

Smoke & Fire Detection
ensure environmental safety

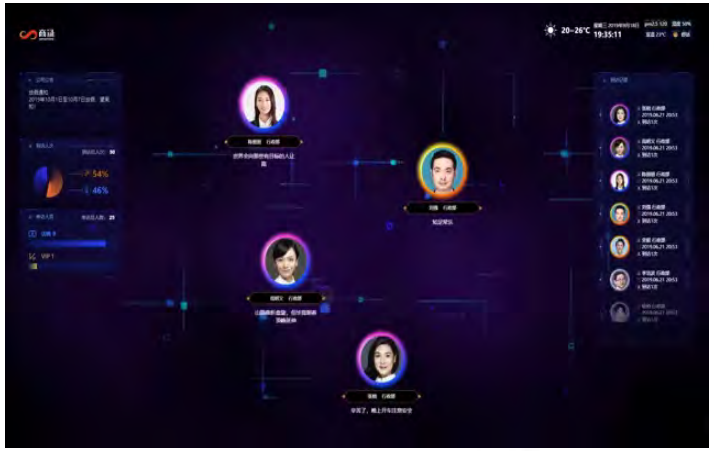
Kitchen Activity Detection

Uniform & Smoke Detection
ensure kitchen safety & hygiene

Hospital Safety

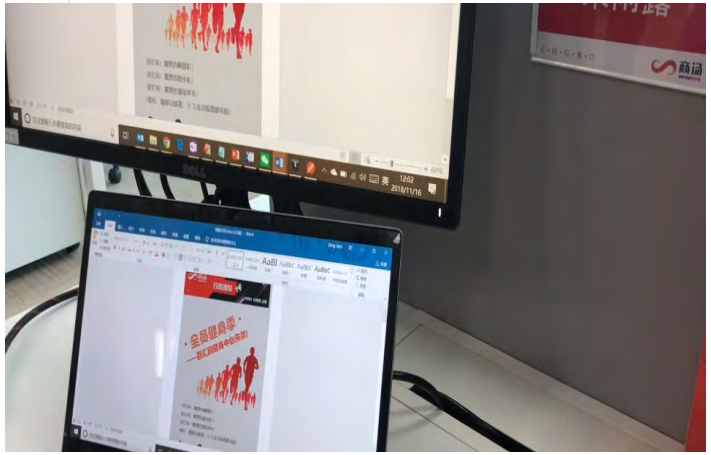
Dangerous Behavior Detection
ensure safety in hospital

AI for Economy | SenseTime Applies Smart Operations for its Smart Office



Use Case

SenseTime inaugurated its China HQ – Xinzhou Building in December 2019. In addition to the futuristic design which won many renowned international architecture awards, the interior of the building is also equipped with software and hardware powered by SenseTime's proprietary AI technologies. The environment allows the staff to immerse in a sense of convenience and smartness while they work.



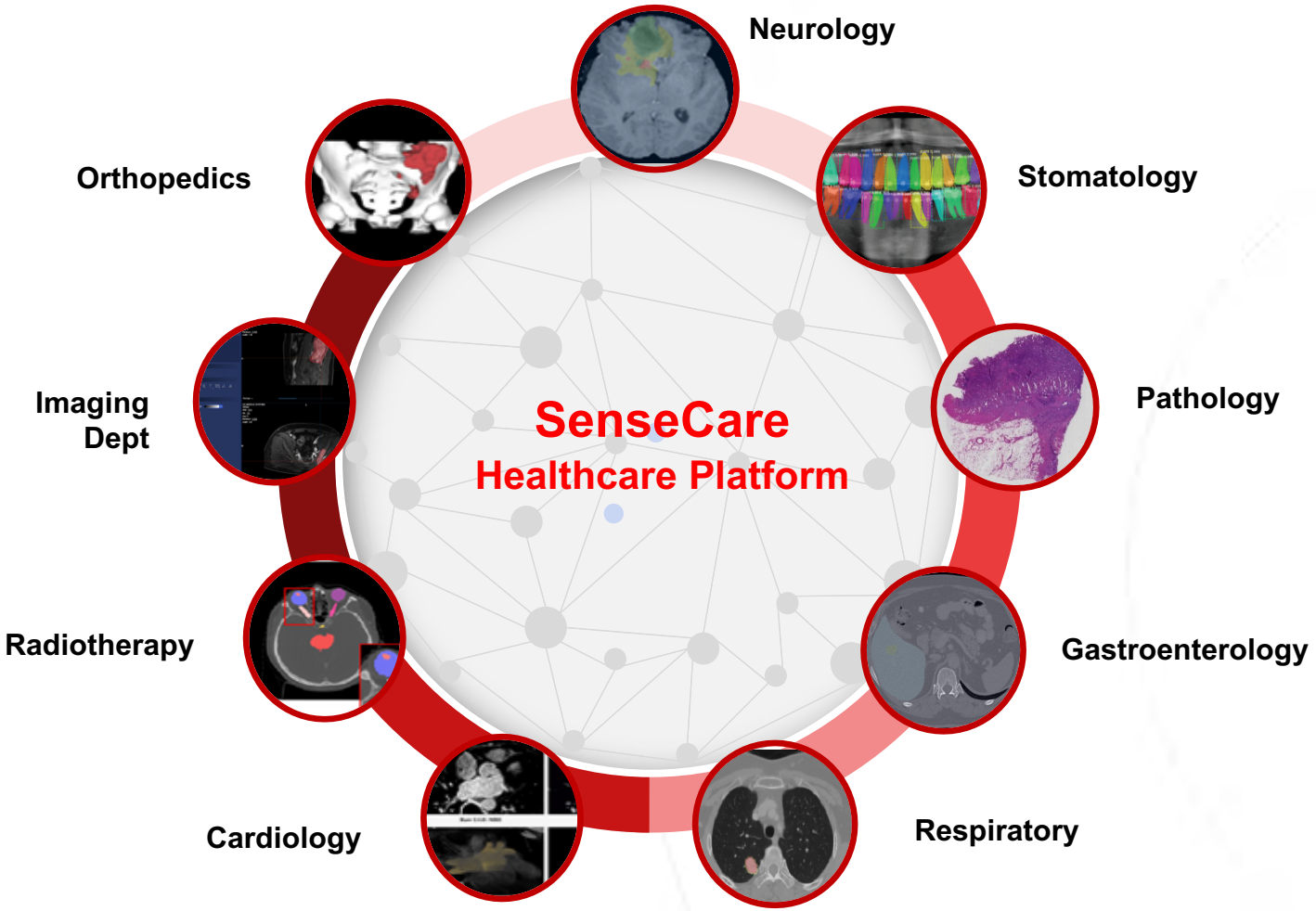
Accomplishments

The SenseOffice Platform integrates most-advanced visitor management system, space management, staff access and attendance management, personnel management, smart reception, smart printing and locker system etc.

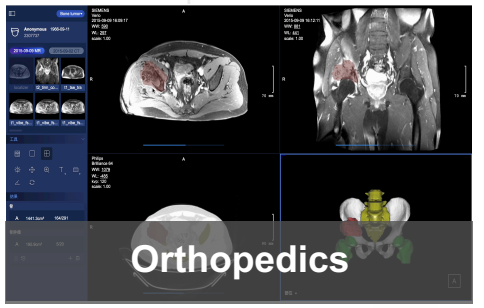
AI not only helps to improve operational efficiency and service quality, but also enables the staff to experience the safety, comfort and convenience brought by technologies.

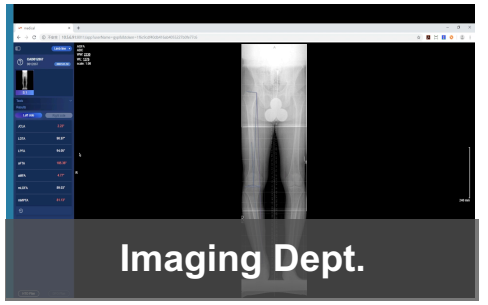
AI for Everyone | Smart Healthcare

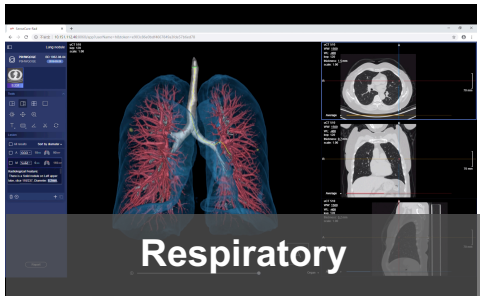
Applications

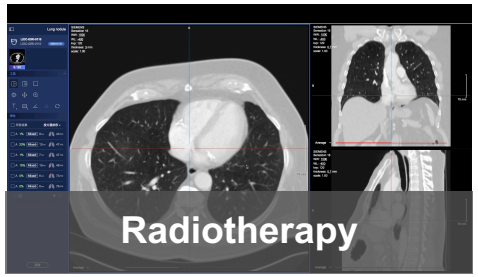


Cases









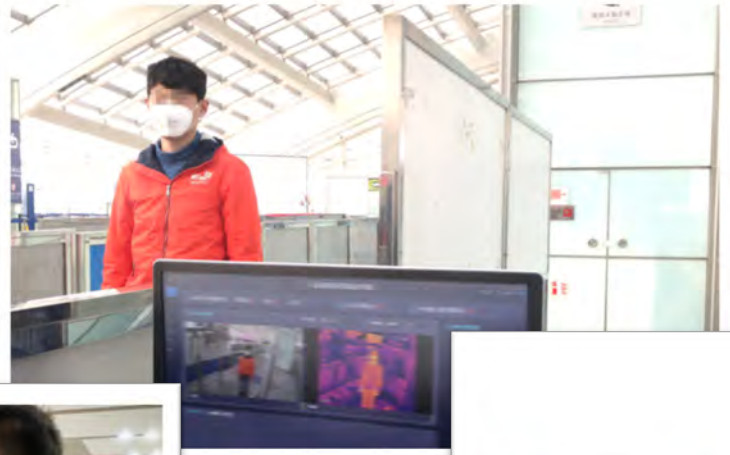
News about SenseTime

SenseTime Co-leads the Development of IEEE Standard for Biometric Liveness Detection to Address Industry-wide Challenge of Biometric Spoofs

News about SenseTime

SenseTime Adva
Development with

2020.05.12



e 'Smart AI Epidemi
Helps Control Corona

ime AI to Improve
Testing

SenseTime's Smart Commute System
Creates Smooth Contactless Journey for

2020.05.07

SenseTime Shortlisted to Help NEXCO
Central Japan Upgrade Expressway

2020.03.27

News about SenseTime

hkpc

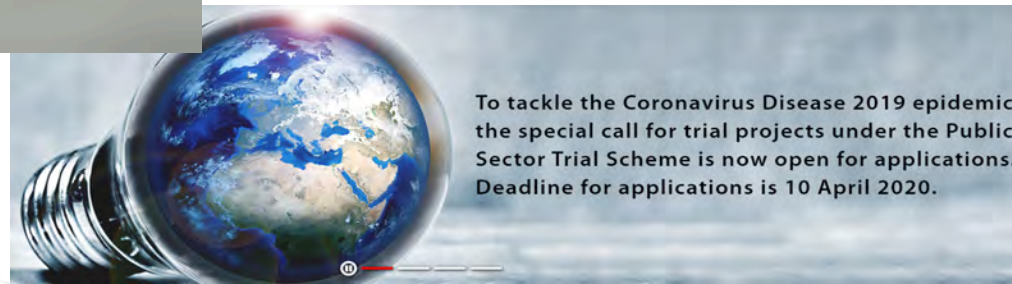
香港教育城 HKedCity

香港 機場管理局 AIRPORT AUTHORITY HONG KONG

HKSTP 香港科技園

教育局 Education Bureau

政府 (13)



Mature & High-precision Sensing Technology

■Object Recognition Technology in Autonomous Driving

■ Using object recognition technology to recognizing the surrounding

■ Environmentally friendly technology for autonomous driving

High recognition accuracy even at night and in bad weather such as rain and fog

Integration with real-time vehicle personnel tracking technology for infrastructure road traffic

SenseTime Artificial intelligence Technology

We will use our software libraries to implement your solution, which uses state-of-the-art *deep learning technologies, and can detect and monitor vehicles and motorcycles from road traffic images with very high accuracy

Advances in Road Traffic Perception

Features

<① Basic performance>
High precision and high recognition rate
No need to adjust or relearn every point

<② Optimization>
Lightweight and fast processing speed,
Real-time processes full HD images

<③ Robustness>
environmental changes and aging resistant, performant in hidden and crowded areas, different lighting conditions e.g. dark and backlight

Advances in Road Traffic Perception

5. Summary

■ **Features**

No.	Item	Example
①	Zoom compatible (No need to calibrate, adjust, and re-learn)	 Far distance  b) wide angle
②	Deep learning method (high robustness, no pause, strong resistance to overlap and congestion)	 a) Traf  
③	Up and down lane detection (Regardless of vehicle direction)	 
④	Windsock (for obstacles in image processing, Automatic response without manual intervention)	 k    g
⑤	Preset deviation (No need to calibrate, adjust, and re-learn)	 Normal  n Slipping
⑥	Rich detection information (Vehicle and personnel detection, Two-wheel detection/vehicle type identification)	   

6． Future Proposal

Suggestions for future development

Detect abnormal events related to traffic flow, considering to developing the following detection functions.
They can be achieved by extracting the abnormal state based on mark recognition and vehicle distance measurement after vehicle detection.

■Figure

When a high-speed vehicle is detected, its information is displayed on the dashboard, and the high-speed vehicle coming from behind is identified.

Vehicles that are too close to other vehicles, and those driving in a sway or have sudden changes in speed are subject to the police report.

It detects dangerous road conditions such as cracks on the road surface and scratches on the white line, and helps to maintain highway repair information.

Identify where you are from by identifying numbers such as large buses. In addition, by querying which IC the car came in through ETC, you can calculate the travel time and estimate SAPA congestion (for example, rest).

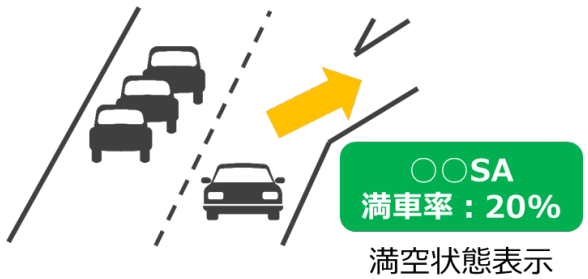
It uses mark recognition to detect vehicles for beginners, elderly drivers and disabled people, and considers surrounding vehicles through prompts such as information boards, and provides a safe environment without driving accidents.

By averaging the average speed of each lane and the number of passing lanes in arbitrary time units, the changes in traffic volume can be aggregated to improve service quality, such as SAPA and toll booths.

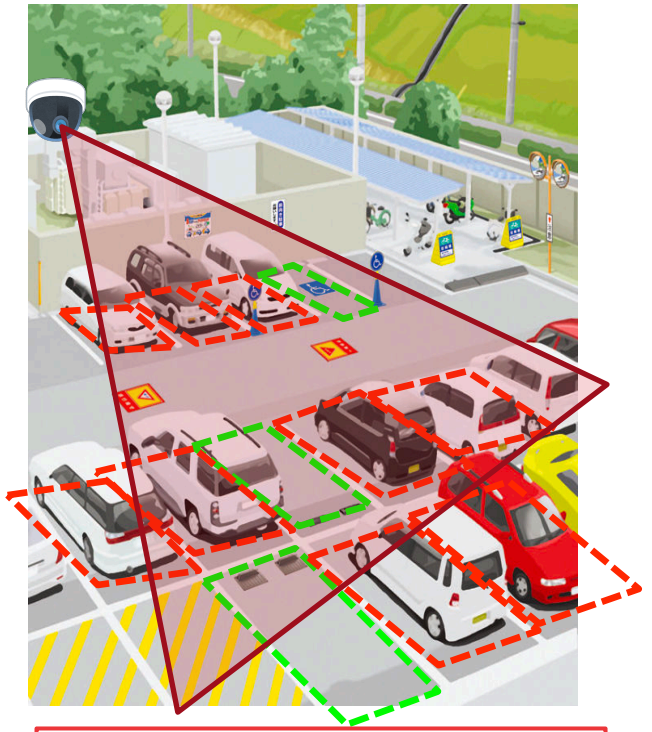
Advanced technology of SAPA parking system

Accuracy improves the status of work

- SA/PA Sky Management
- detects whether there are vehicles in each parking space through the camera image and provides full charges.
- In combination with the display panel at the entrance of SA/PA, drivers are encouraged to use SA/PA to minimize the loss of opportunity



満空状態表示



SA・PA Full-Empty Management

(1) VGA image detection and evaluation (July 2019)

(2) Detection and evaluation of FHD images (Jan 2020)

■ Result

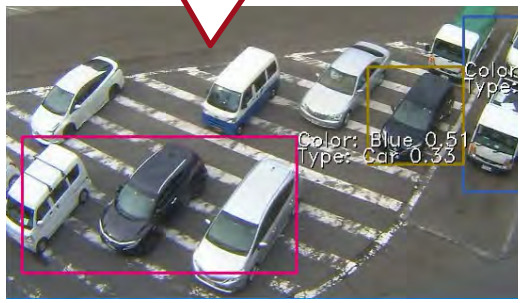
Depending on the angle of view and the overlap of the vehicles, some of them may not be detected.

⇒ Vehicle detection method using video tracking instead of still images

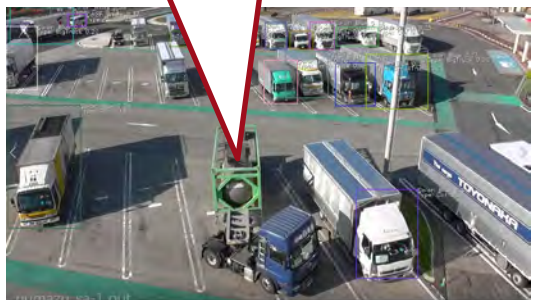
Can be used to detect undetected items!

(3) Response to other questions

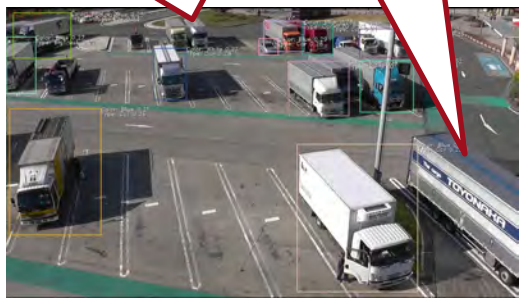
Fail to detect on zebra-crossing



Vehicles diagonally opposite or beyond the parking rack.



Misrecognised a box as a vehicle



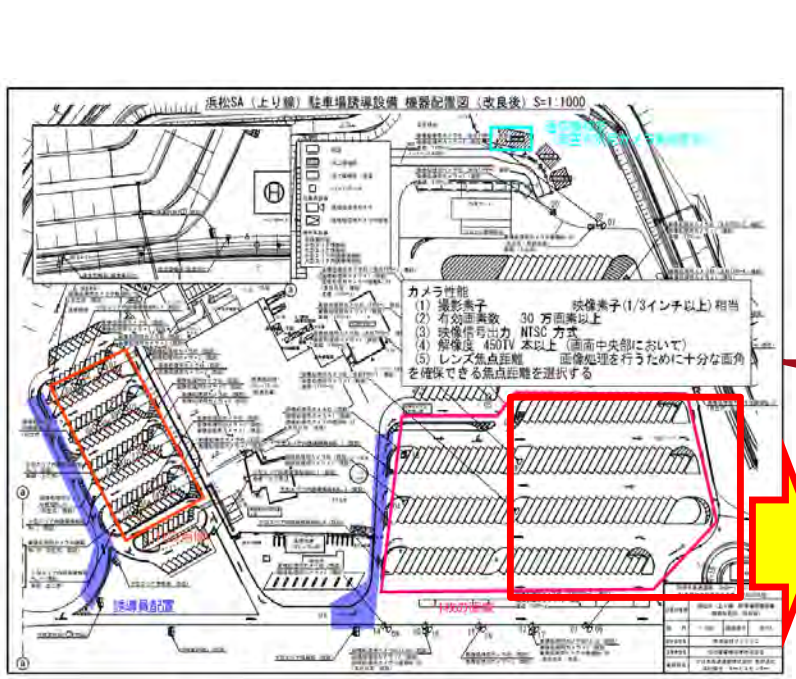
(4) Future Improvement

① Enhance Accuracy

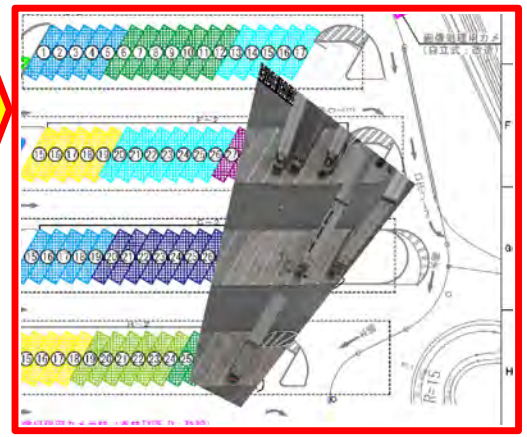
Overhead image conversion technology

* Hamamatsu SA's tablet distribution system is blank

Requirement：Large vehicle area: 23 cameras → merged into one image (composition of bird's-eye image); Small car area: 18 cameras → merged into one image (composed of elevated images)



Partial Test Result



Overhead image conversion technology

CCTV Image

Conversion of Aerial View

Tunnel video analysis and inspection

(1) Visualize the situation in the tunnel

- **Anomaly detection (falling objects, etc.)**
- **Evacuation guidance**
- **Number of vehicles by vehicle type**

Tunnel video analysis and inspection

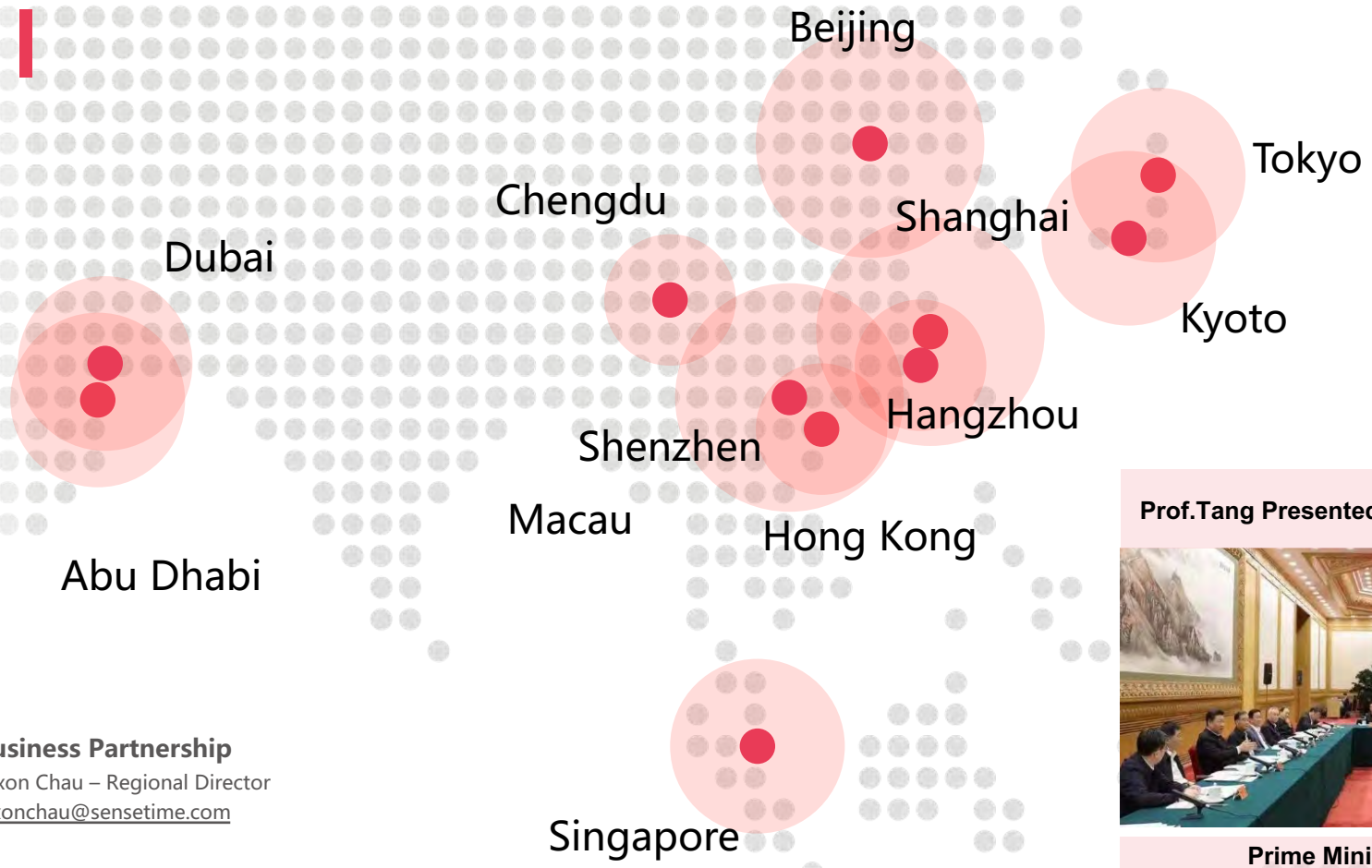
[Consider the following demonstration images]

(1) carry out Aerial View image conversion in the tunnel
(camera position is lower than the truck roof)
(2) 22 cameras in the internal tunnel, switch every 3 seconds.
→How to show and count the test results ?
(3) The entrance cameras under the 4 partitions are not switched.
→ The number of vehicles entering the tunnel can be calculated. The vehicle type can also be determined.
(4) The bright image in the tunnel is also a color image, and no problem in the visible light image processing.
(5) Since it switches within 3 seconds, it is necessary to add judgment logic for accidents and parked vehicles.
(6) Since switching within 3 seconds, please check the detection time of falling objects.
(7) People can be detected.
(8) Fire disaster prediction (optional)
(9) Knows the number of cars coming in,
but not the number of cars going out

■Refining the Requirements

SenseTime Ecosystem: 1,100+ Well-known Enterprise Customers

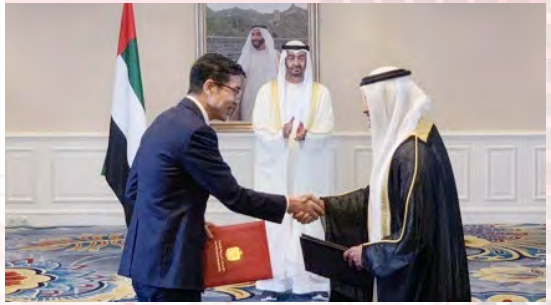
AI Globalization



Prof.Tang Presented AI to President Xi Jinping

Prime Minister of Singapore Lee Hsien Loong

Crown Prince of Emirate of Abu Dhabi Mohammed bin Zayed Al Nahyan



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AI Empowering the Future

商汤
sensetime