Next-Generation Video Search

Introduction to Aicuda AIVA

Aicuda Technology - overview

- Software company in enterprise **video search** & video data mining

- R&D and product development together with **Research Institutes** from Netherlands and Taiwan

- **400+ years** of man hour deep learning development

- Deep expertise in **video analytics**, big data and cloud computing

- Pioneering applications in **deep learning** technology

- **30+ patents** in AI, big data analytics and cloud computing

- Headquarter: Veghel, **the Netherlands**

Aicuda Technology - AI Video Analytics

AI Features AIVA VSA Series
- Face Recognition
- Fire Detection
- Intrusion Detection
- License Plate Recognition
- People Counting
- Vehicle Counting
- Video Search
- Weapon Detection

AI Features AIVA PVC Series
- Illegal Parking
- Loitering
- People Counting
- Person Falling / Crouching
- Reverse Movement Persons
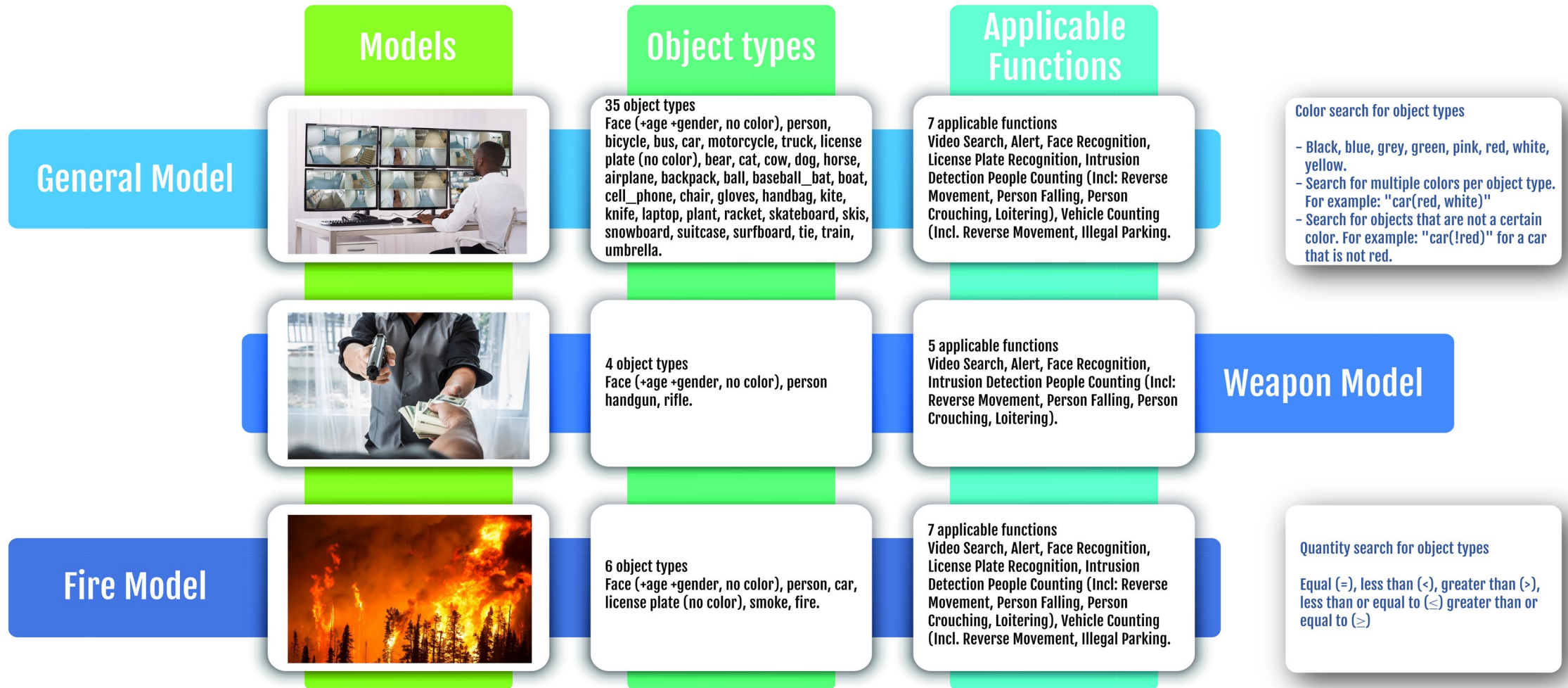- Reverse Movement Vehicles
- Vehicle Counting
- Video Search

AI Features AIVA LPR Series
- License Plate Recognition

Aicuda Technology - object types search

Models

Object types

Applicable Functions

General Model

35 object types
Face (+age +gender, no color), person, bicycle, bus, car, motorcycle, truck, license plate (no color), bear, cat, cow, dog, horse, airplane, backpack, ball, baseball_bat, boat, cell_phone, chair, gloves, handbag, kite, knife, laptop, plant, racket, skateboard, skis, snowboard, suitcase, surfboard, tie, train, umbrella.

7 applicable functions
Video Search, Alert, Face Recognition, License Plate Recognition, Intrusion Detection People Counting (Incl: Reverse Movement, Person Falling, Person Crouching, Loitering), Vehicle Counting (Incl. Reverse Movement, Illegal Parking.

Color search for object types

– Black, blue, grey, green, pink, red, white, yellow.
– Search for multiple colors per object type. For example: "car(red, white)"
– Search for objects that are not a certain color. For example: "car(!red)" for a car that is not red.

4 object types
Face (+age +gender, no color), person handgun, rifle.

5 applicable functions
Video Search, Alert, Face Recognition, Intrusion Detection People Counting (Incl: Reverse Movement, Person Falling, Person Crouching, Loitering).

Weapon Model

Fire Model

6 object types
Face (+age +gender, no color), person, car, license plate (no color), smoke, fire.

7 applicable functions
Video Search, Alert, Face Recognition, License Plate Recognition, Intrusion Detection People Counting (Incl: Reverse Movement, Person Falling, Person Crouching, Loitering), Vehicle Counting (Incl. Reverse Movement, Illegal Parking.

Quantity search for object types

Equal (=), less than (<), greater than (>), less than or equal to ($\leq$) greater than or equal to ($\geq$)

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Aicuda Technology - key values AIVA appliance
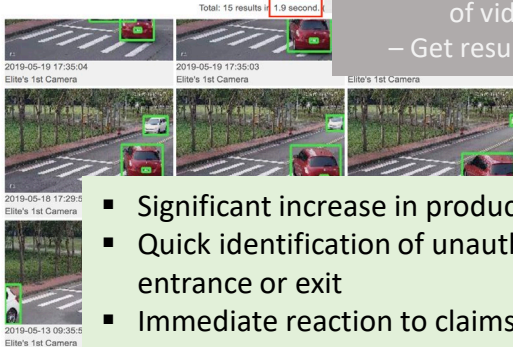
Speed

- **Google-like search**: most search queries complete **< 2 seconds** (4500x faster than manual search)
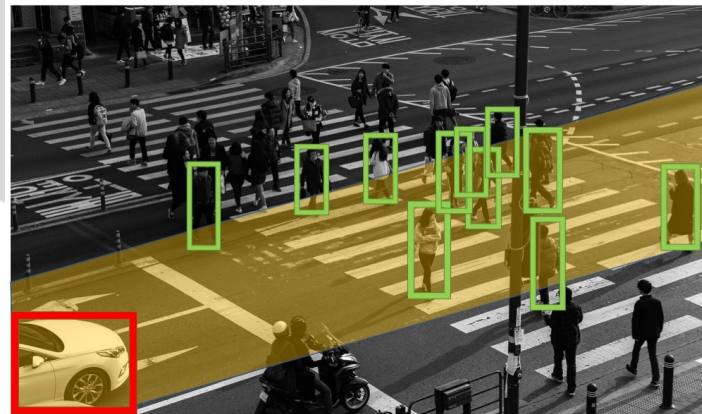- **Real-time alerts**

Search through Terabytes of video data – Get results in 1.9 s

- Significant increase in productivity
- Quick identification of unauthorized entrance or exit
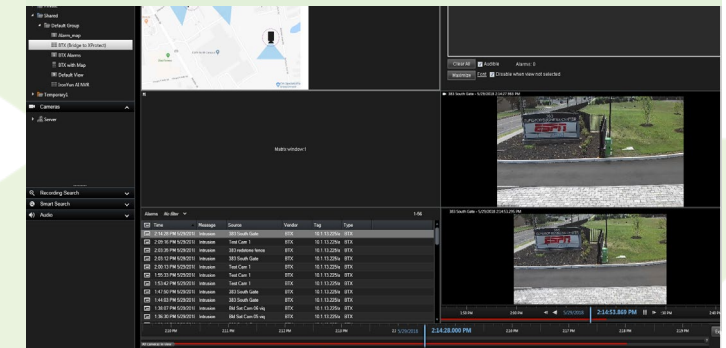- Immediate reaction to claims

Accuracy

- **>95% accuracy** in object, people & vehicle detection with appropriate camera settings
- **No false alarms** caused by animals, shadows, weather conditions, etc.

Ease of Use

Seamless integration with existing VMS

- **Plug & Play** from day 1
- Intuitive User Interface
- Easy Integration
- Stable Performance

Aicuda Technology - AI Customer Benefits

Aicuda AIVA Customer Benefits

- Platform is **trained** to recognize objects and patterns, **not programmed**

- **Pre-trained AI model** - commercial ready solution, customer does not need to train or calibrate the appliance before use

- **All-in-One Solution** - supports multiple AI functions in one plug & play appliance

- **Easy to use**

- Appliance supports **real-time notifications / alerts**, **live stream** + **forensic** analytics

- Appliance provides **instant playback** video

- Maximize the use of NVIDIA high-performance GPU

- Easy **partner proven integration** with existing VMS vendors

- Appliance supports all **ONVIF IP-based** cameras, turns IP cameras into smart AI-powered IP cameras
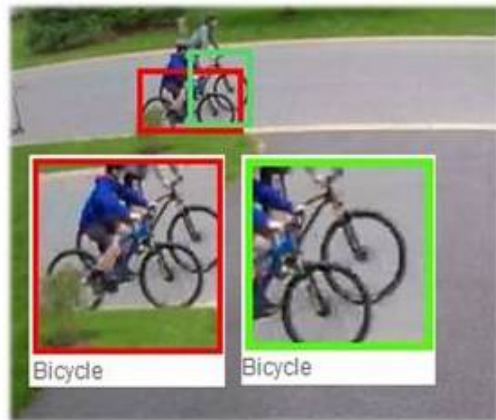
- Significantly **increase in productivity**
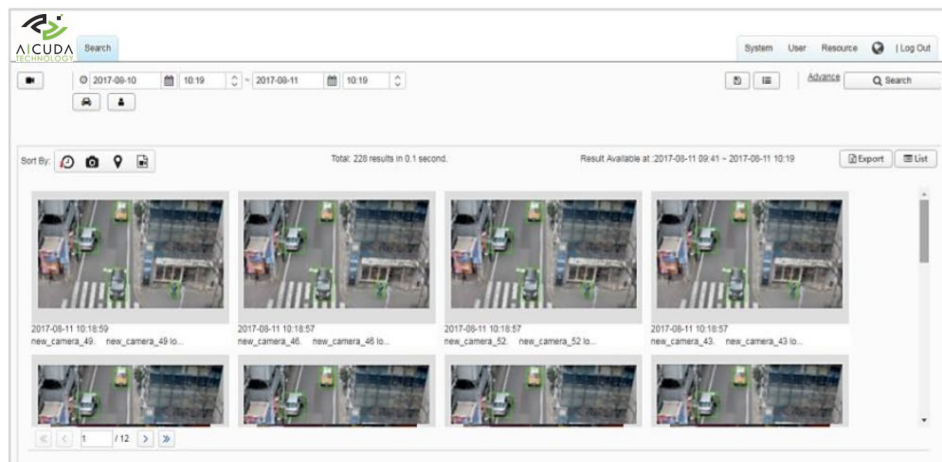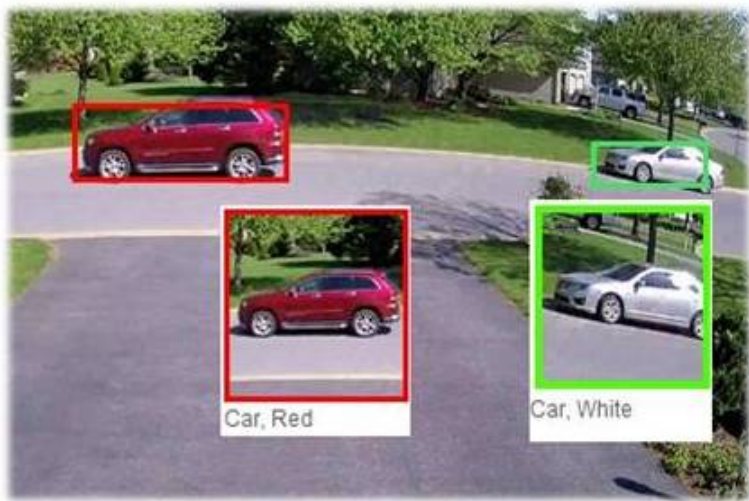
Search objects and people based on type and attributes (color, quantity, gender, age)

Highlights:

Simple, Google-like search engine and intuitive result display based on easy-to-use natural language interface

Search tasks through terabytes of video that took hours before can now be completed in seconds

AI Video Search

AI Intrusion Detection

AI Face Recognition

AI LPR

AI Tracking

Aicuda Technology - AI Intrusion Detection
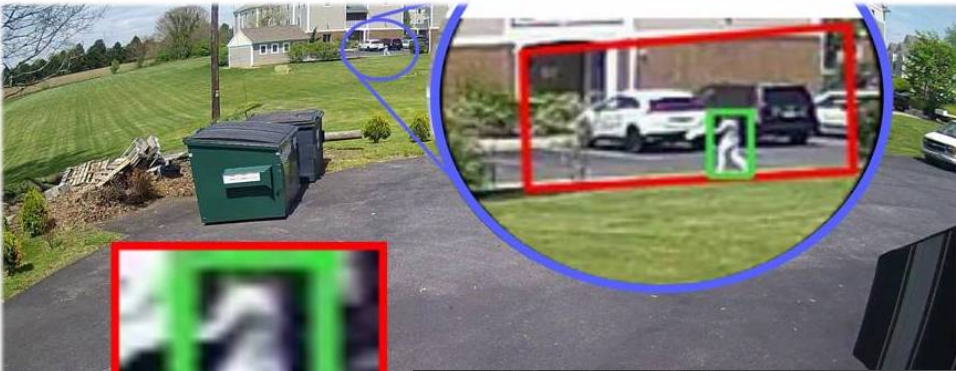
Person, White

Address the pain points of optical and sensor-based intrusion systems:

- **Reduce false-positive rates** caused by animals, shadows, weather etc.
- Easy to setup and configure
- Time saving
- Lower operational costs

AI Solution: detect object based on type, **NOT** size
Reduce false positives by orders of magnitude

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AI Intrusion Detection works well with other systems
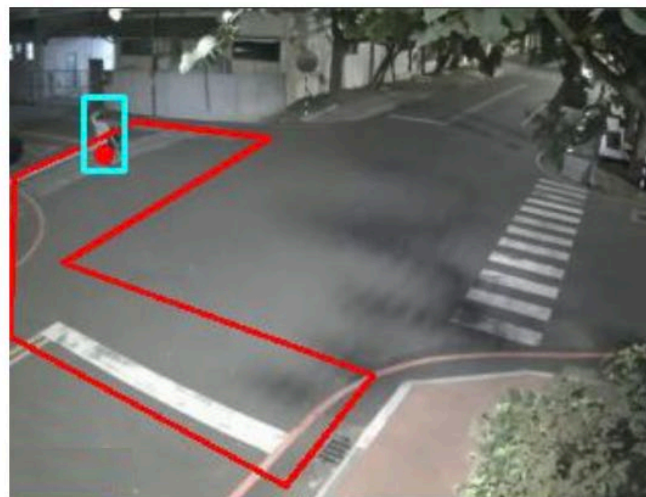

- AI Intrusion Detection works well with thermal and IR cameras in low light conditions
- AI Intrusion Detection can be easily integrated with other systems for multiple-layer protection, for example: alarm triggers automatic door locking

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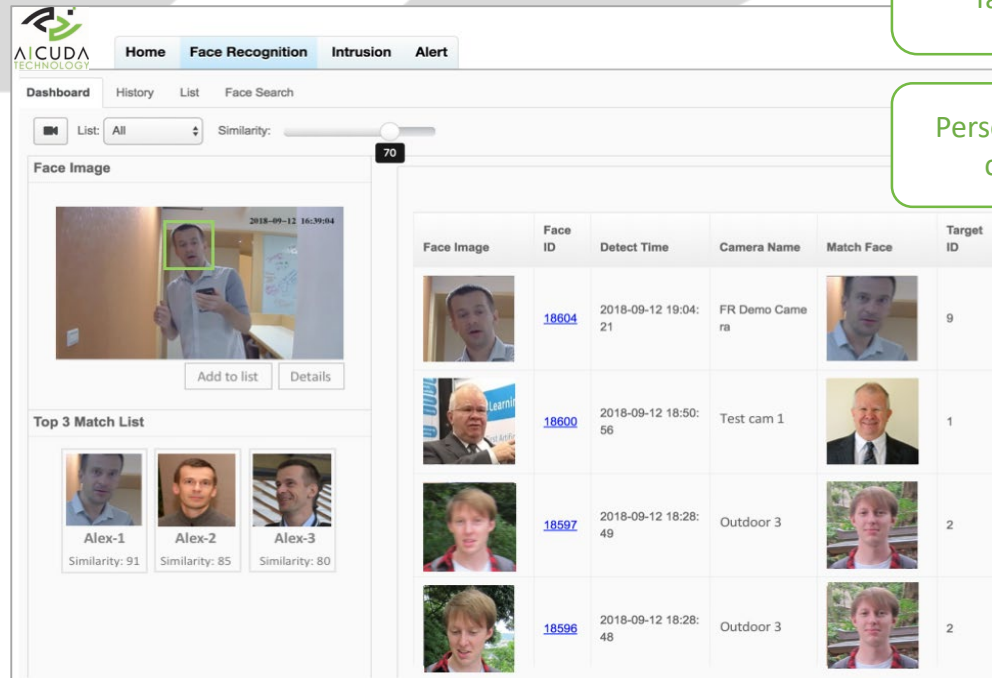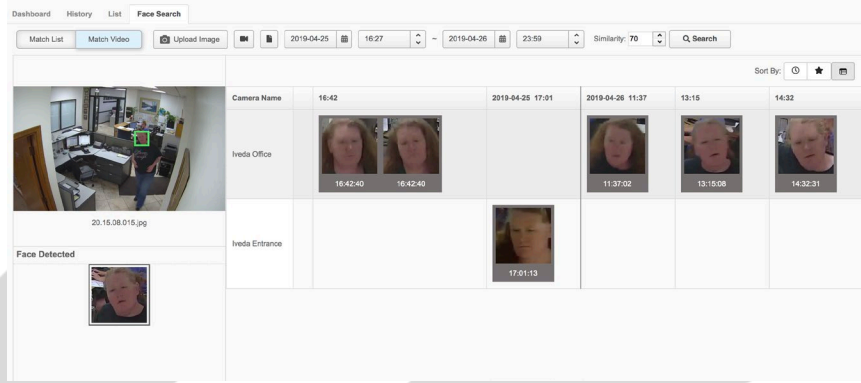# Aicuda Technology - AI Face Recognition

AI Video Search

AI Intrusion Detection

AI Face Recognition

AI LPR

AI Tracking

Auto detection & identification

Easy management

Easy data access

Automatic, simultaneous detection of multiple faces in one video frame / image

Support multiple face lists for access control, customer / employee management, etc.

Store detected face images with timestamps

Automatic comparison between detected face and face database to find matches

Trigger alert according to desired rules for each list

Provide 10-second playback of the event when the identified face appears

Person does not have to be close to the camera

Quick import / export of face lists

Target person can be located within a few seconds to enable fast response time
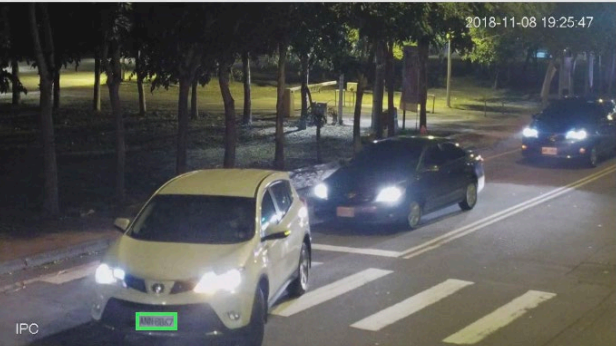
AI License Plate Recognition

3 application modes to optimize performance
- Parking lots
- City roads
- Highways

Functions:

- Support license plate / automatic number-plate recognition (LPR / ANPR) at highway speed
- Send alerts for specific lists of license plates (e.g., access control for employees)
- Send alerts for unauthorized vehicles

AI Video Search

AI Intrusion Detection

AI Face Recognition

AI LPR

AI Tracking

AI Counting – People & Vehicle Tracking
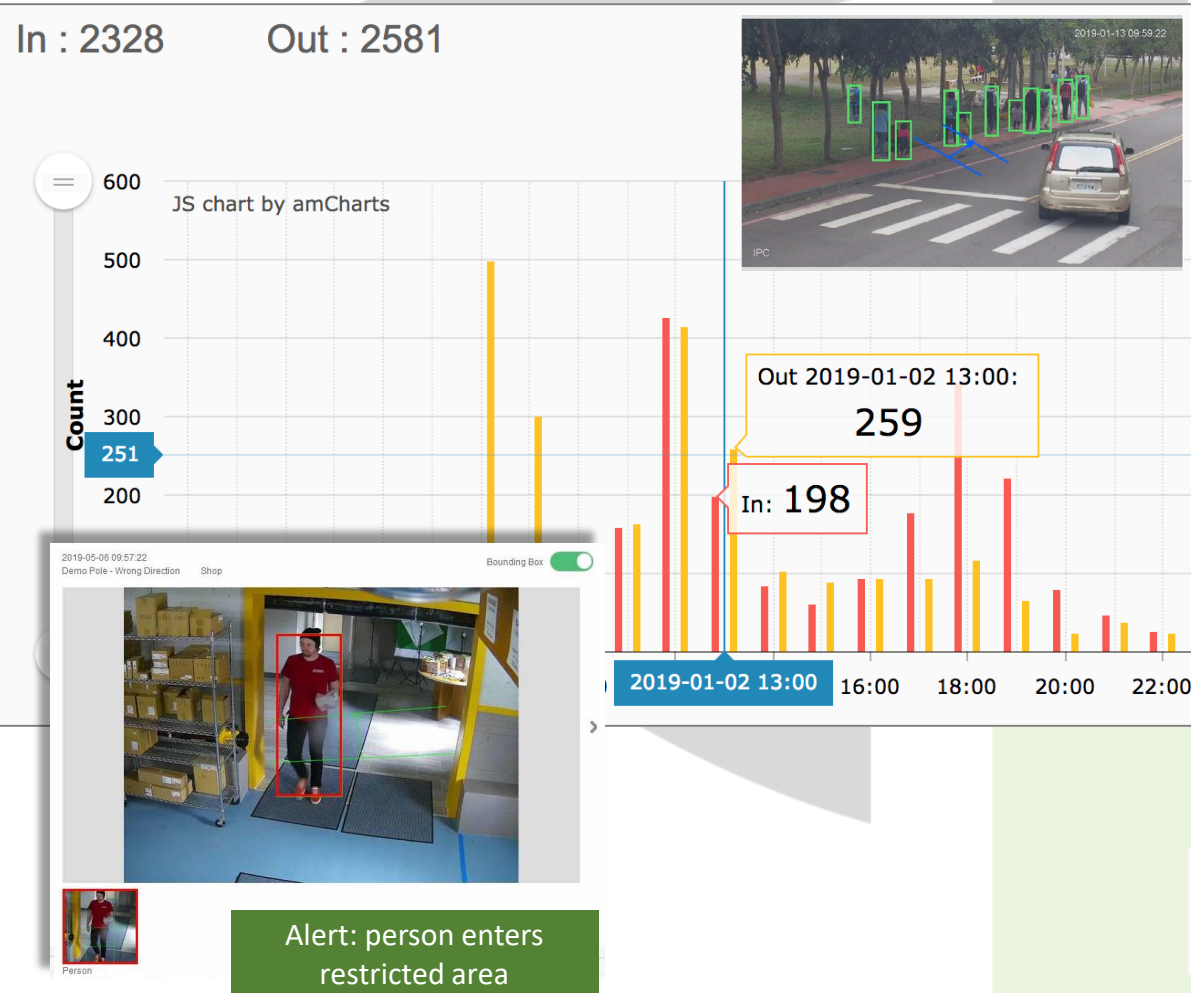
Functions:

- Bi-directional / reverse movement counting for people and vehicles
- Prevent multiple entries / exits
- Send alerts for abnormal behavior:
  - reverse direction;
  - people falling;
  - people crouching;
  - loitering;
  - Illegal parking

In : 2328   Out : 2581

JS chart by amCharts

Out 2019-01-02 13:00:
259

In: **198**

2019-01-02 13:00   16:00   18:00   20:00   22:00

Alert: person enters restricted area

Aicuda Technology - Deployments

Construction Site
Object Search & Alert (safety vest, hardhat, safety shoes) + Intrusion Detection

School campus
Object Search & Alert + Intrusion Detection + FR + Weapon Detection + Loitering

Hotel & Casino
FR + LPR + People Counting + Vehicle Counting + Intrusion Detection + Object Search

Traffic management
People Counting + LPR + Vehicle Counting + Reverse Movement + Illegal-Parking

Apartment complex
Loitering + FR + LPR + Vehicle Counting + Illegal-Parking + Intrusion Detection + Animal Detection & Alert

Corporate campus
Object Search & Alert + Intrusion Detection + FR + LPR

Shopping center
People Counting + FR + Intrusion Detection + LPR + Vehicle Counting

Police
FR + LPR + Illegal Parking + Reverse Movement Alert + + Intrusion Detection

Airport
Luggage Search & Alerts + FR + LPR + Intrusion Detection + People Counting

Health care facility
FR + Fall Detection + Intrusion Detection

Military
Object Search + Alert (military vehicle, weapon)

Government offices
Intrusion Detection + FR + Weapon Detection

Manufacturing facility
Object Search & Alert + Intrusion Detection + FR + LPR