



# **AI BOX**

# **Video Analytics**

**AI video analytics BOX** for technical and creative professionals who demand high performance for the world's heaviest workloads



**AI Bridge TS2-08-channel**

[Order Now](#)

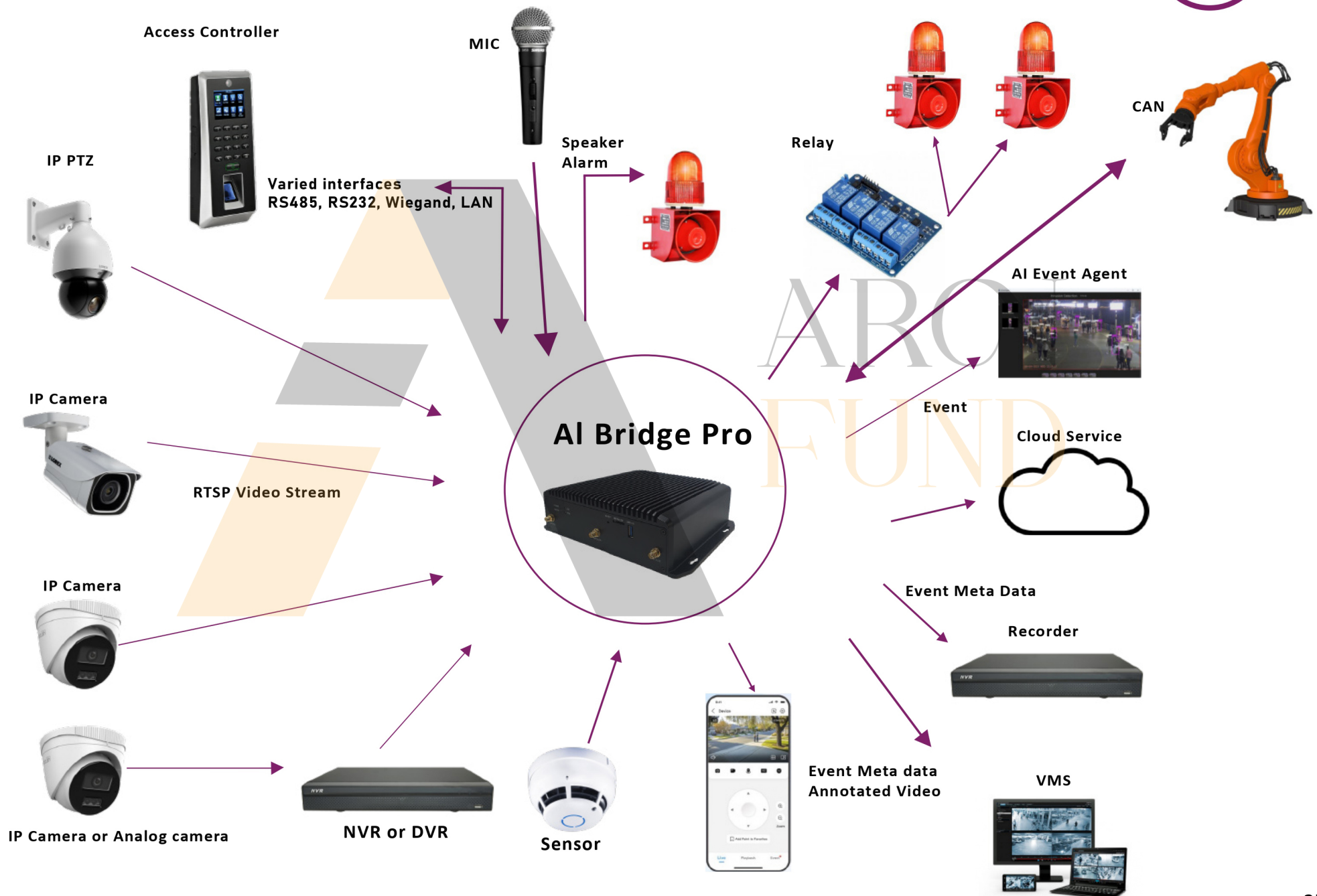


**AI Bridge TE1-04-channel**

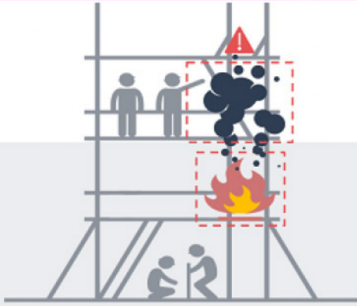
[Order Now](#)



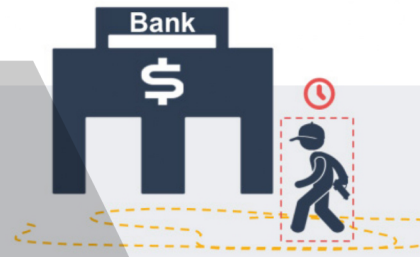
## AI VIDEO ANALYTICS BOX



### Fire & Smoke Detection



### Loitering Detection



### Virtual Fence



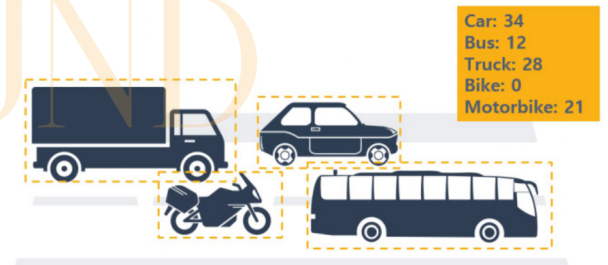
### Stopping Detection



### Covered Face Detection



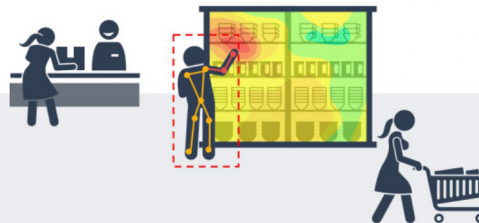
### Vehicle Type Detection



### LP Masking



### Advanced Heatmap



### No PPE

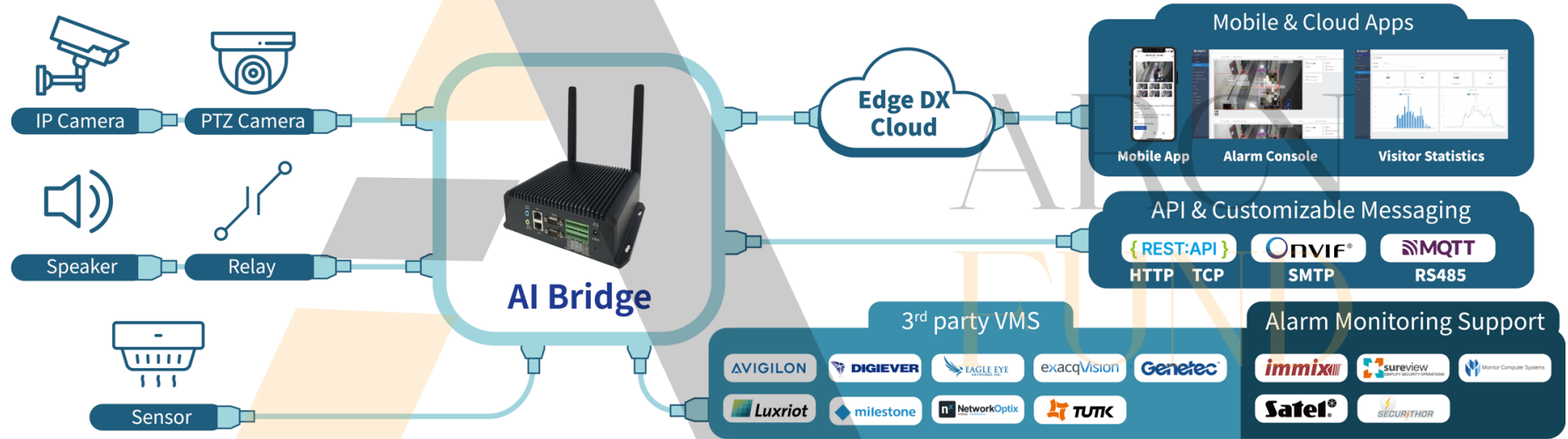




Intrusion Detection	Heatmap	Vehicle Type Detection	Object Location Tracking
Zone Counting	Basic Attribute	Occupancy Counting	Phone-Walking Detection
Enter/Exit Detection	Advanced Attribute	Occupancy Car Counting	Unsafe Lifting
Stay & Go	Dynamic Privacy Masking	People Counting	Speed Anomaly Detection
Speed Anomaly Detection	Dynamic Face Masking	Vehicle Counting	Vehicle Queue Management
Multi Zone Counting	No Mask	Advanced Visitor Analysis	Forklift Non-Driver Detection
Covered Face Detection	Hand & Foot Intrusion	Vehicle Type Counting	Intentional Body Gaze Detector
Aggressive Detection	Fallen Person Detection	Queue Management	Work Vehicle Hazard Detection
Illegal Dumping	Imminent Threat	Forklift No Helmet	Staff Exclusion People Counting
Animal Detection	Bullying Detection	Crowd Detection	Reverse Movement Detection
Vehicle Counting	Forklift Detection	Human Prolonged Stay	Road Pedestrian Detection

# Overall System Diagram & Topology

## AI Bridge Intelligent Edge AIoT Gateway for Video Analysis

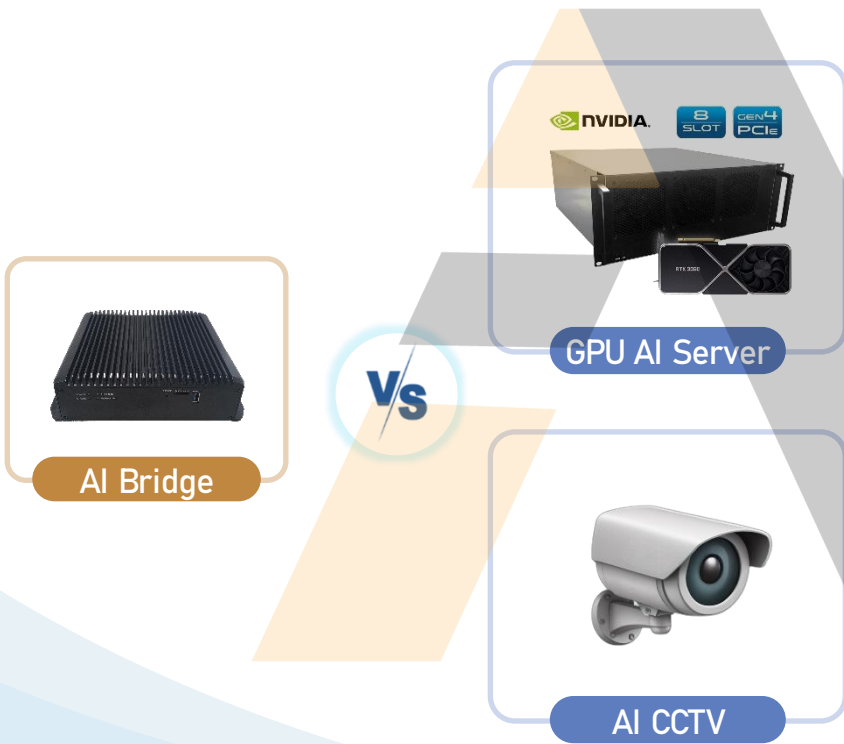


- ✓ Transform anything based on vision into a diverse range of AI applications (using IP CCTV)
- ✓ Expand into various IT services utilizing video analysis data through Cloud Interface



# AI Bridge vs. Other AI Solutions

RoHS, REACH, NDAA Compliant



1

## Embedded On-premise AI analyzer

- AI chipset for autonomous vehicles (DSP Processor)
- **AI-dedicated device with no waste of system resources**
- Compatible with all types of network CCTV

2

## GPU servers are costly and overpowered

- Unnecessary over-powered servers for CCTV analysis
- GPU servers **underutilize performance, wasting resources.**
- **High cost, excessive power consumption.**

3

## AI CCTV has limited computing power

- **Low-spec chipsets** support only basic video processing
- Supports **basic** detection, intrusion, and counting
- **Unsupported features** (Behavior, complex multiple algorithms)

# Cost Performance Comparison

RoHS, REACH, NDAA Compliant



## Cost-performance comparison

"AI bridge" vs  
GPU base server

$\frac{1}{5}$

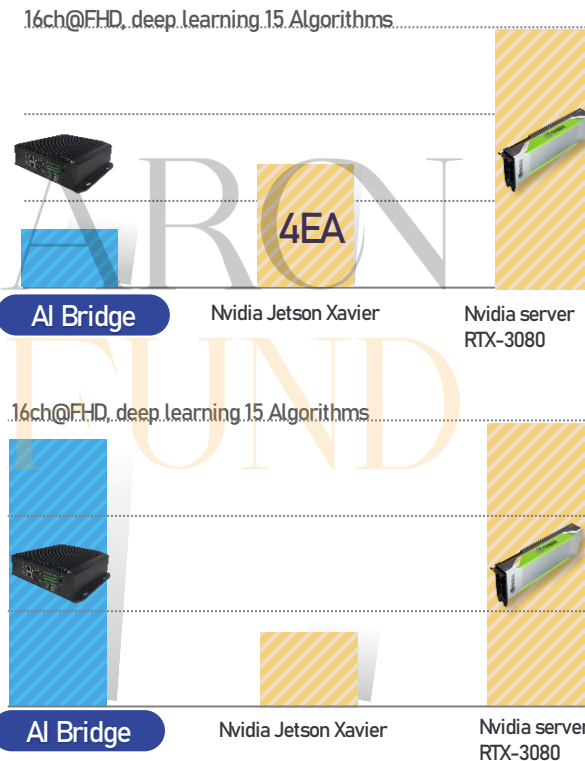
Similar performance as GPU  
Server (RTX-3080)



Cost



Performance



# Features

RoHS, REACH, NDA Compliant



- ✓ Over 50+ intuitive AI apps (**On-premises**)
- ✓ Multiple AI Algorithms run on single channel
- ✓ Advanced human behavior analysis
- ✓ Support up to 16 camera channels
- ✓ Wide temperature range **without fan**: -22°F (-30°C) ~ 158°F (70°C)
- ✓ Supports various protocols and VMS
- ✓ P2P-based mobile alarm viewer
- ✓ **LTE & GPS support** (option)
- ✓ Internal recording with M.2 NVME SSD (optional)
- ✓ Cloud-based dashboard (option)
- ✓ Hybrid AI Boost mode support

FC CE UK CA



4CH (6Watts) / 16CH (16 Watts)

AI Bridge Series



TEXAS INSTRUMENTS



Perimeter Security



Retail



Advanced BI



ITS



Public Safety



Hospital



Smart Building



Construction

Various Applications

# 50+ AI Apps and More

RoHS, REACH, NDAA Compliant

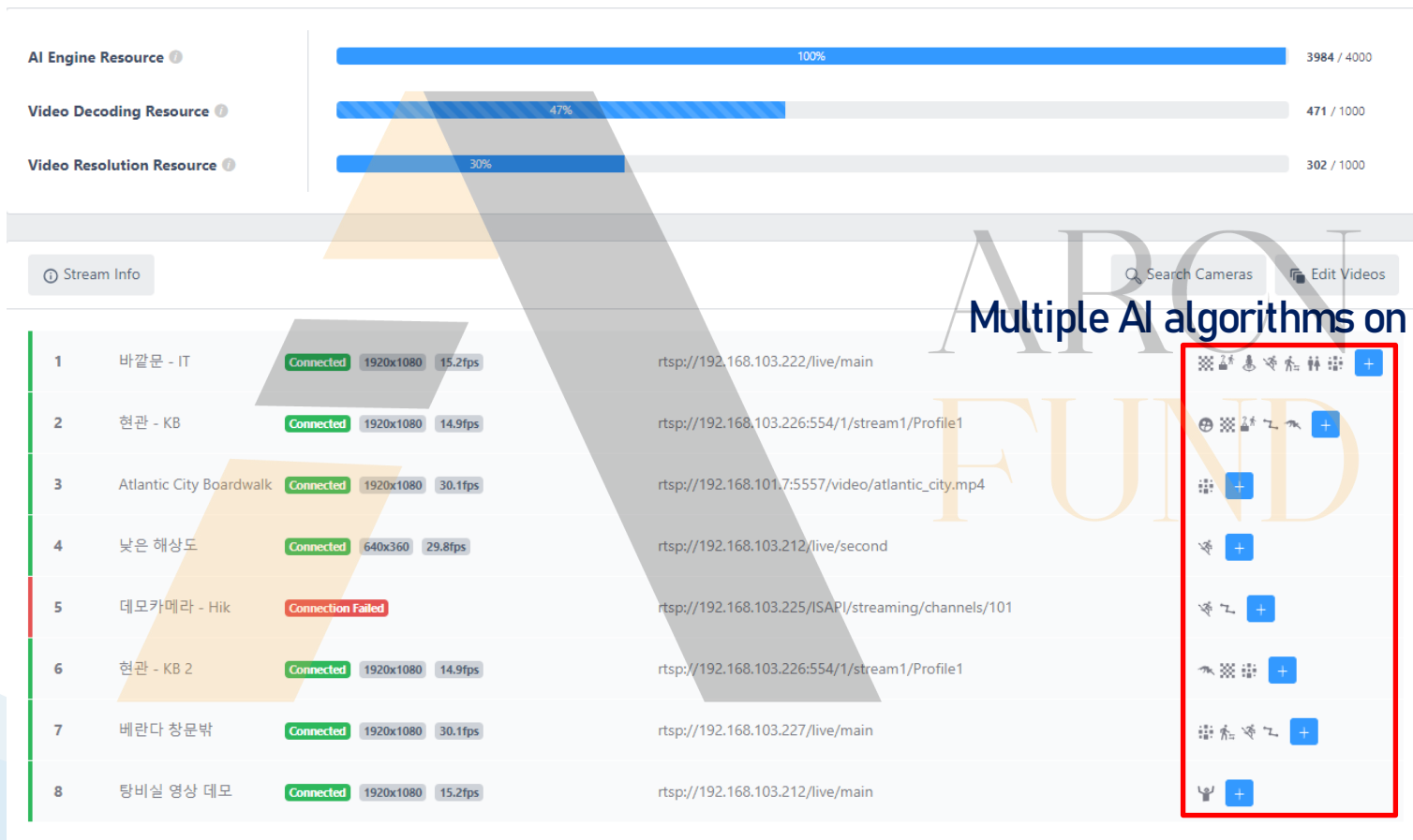


On-premise 50+ Apps

And more Hybrid AI Boost AI Apps



# Multi-Channel & Multi-AI Performance



Multiple AI algorithms on a channel

# Integration



## REST API

- Annotated video streaming
- Event metadata
- Interoperability with VMS

- Various web
- Any legacy place
- Any device



Firefox



Google Chrome



Safari



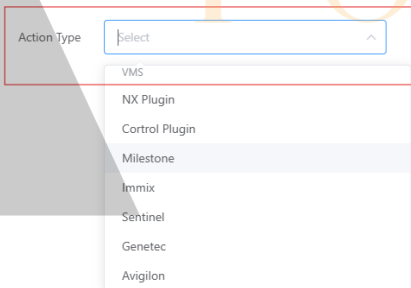
Opera



Microsoft Edge

## Proprietary integration

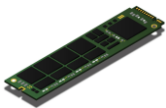
- ONVIF M not enough
- Full support though **plug-ins** for major VMS & Alarm Systems



## Customizable event transmission via network and serial

- Users can customize event messages **without coding through an editable UI**
- Supports HTTP, TCP, MQTT, SMTP, RS232/485

```
{
  "device_name": "[[DEVICE NAME]]",
  "mac": "[[MAC]]",
  "sn": "[[SN]]",
  "ch_name": "[[CH NAME]]",
  "event_type": "[[EVENT TYPE]]",
  "event_name": "[[EVENT NAME]]",
  "date_time": "[[TIME YYYY-MM-DD]] [TIME HH:MM:SS]",
  "timestamp": "[[TIMESTAMP]]"
}
```

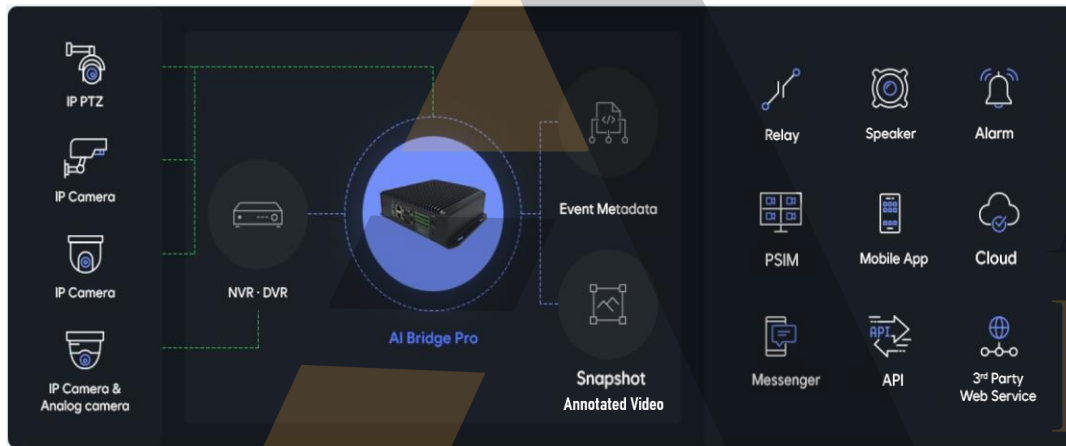


M.2 SSD up to 4TB



# Integration Status

## System configuration diagram & integration with VMS/PSIM



VMS

**AVIGILON™**  
**n<sup>x</sup> NetworkOptix**

**EAGLE EYE  
NETWORKS**

**exacqVision** **Genetec™** **milestone**

Alarm monitoring

**immix**

**sureview**  
SIMPLIFY SECURITY OPERATIONS

**Monitor Computer Systems**

**Satel®**  
Made to Protect

**SECURITHOR**

### Cloud / Messenger



### API / Integration



### 3rd Party Web Service



### Speaker



# Comprehensive AI Modeling

Comprehensive analysis of detected objects and video on multiple levels

- ✓ Multi-level detailed analysis of detected objects
- ✓ Multiple AI algorithms can be executed concurrently on each channel

Object Detection

Object Tracking

Pose Estimation

Multi-Attribute Analysis

Scene Understanding

Dynamic Privacy Masking

Movement pattern analysis  
(Motion, Velocity, Stationary Object)

Understanding situation through  
historically stored data

Time series event data analysis





Intuitive AI Apps & Applications

ARON  
HEND

A more powerful AI platform

**AI Bridge**

Creating a better and safer world through EdgeDX technology

# AI application lists (50+)

Basic	Advanced	Extra
Dynamic Privacy Masking	Crowd Detection	LPR-US, Europe, JP, KR
Dynamic Face Masking	Advanced Visitor Analysis (Gender)	Advanced Heatmap
Basic Attribute (Color of Clothes)	Hand & Foot Intrusion	No PPE
Queue Management	Intentional Body Gaze Detector	Illegal Dumping
Heatmap	Imminent threat	Aggressive Detection
Combined Counter Trigger	Fallen Person Detection	PTZ Tracking
Intrusion Detection	Animal Detection	Forklift No Helmet
Loitering	Fire & Smoke Detection	Forklift Non-Driver Detection
People Counting	Vehicle Type Counting	Forklift Detection
Vehicle Counting	Vehicle Type Detection	Staff Exclusion People Counting
Zone Counting & Multi-Zone Counting	Thermal Intrusion Detection	Bullying Detection
Virtual Fence (Line Crossing)	Drone View (TBD)	Illegal Parking (TBD)
Stopping	Fisheye Video	Human Prolonged Stay (TBD)
Stay & Go (Enter & Exit)	Corridor Mode Support (TBD)	
Speed Anomaly Detection	Advanced Attributes	
Occupancy & Occupancy Car Counting		
(Number of people & cars in a multi-entry building)		



<b>Dynamic Privacy Masking</b> 	<b>Basic Attribute</b> <b>Color of Clothes</b> 	<b>Queue Management</b> 
<b>Basic Heatmap</b> 	<b>Intrusion Detection</b> 	<b>Loitering Detection</b> 
<b>People Counting</b> 	<b>Vehicle Counting</b> 	<b>Zone Counting</b> 
<b>Virtual Fence</b> 	<b>Stopping</b> 	<b>Stay &amp; Go</b> 

**Occupancy**

## Applications

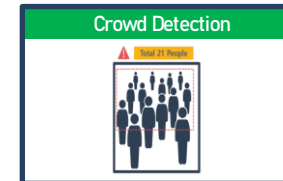
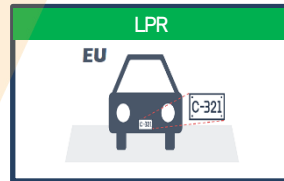
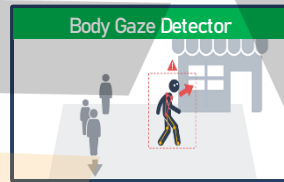
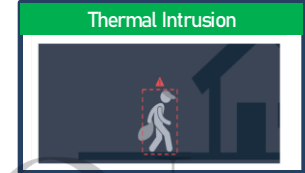
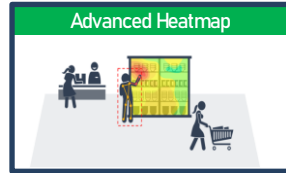
**Typical Security Management**

**Perimeter Security**

**Integrated to NVR, VMS, alarm monitoring system**

**Retail for Marketing & Security**

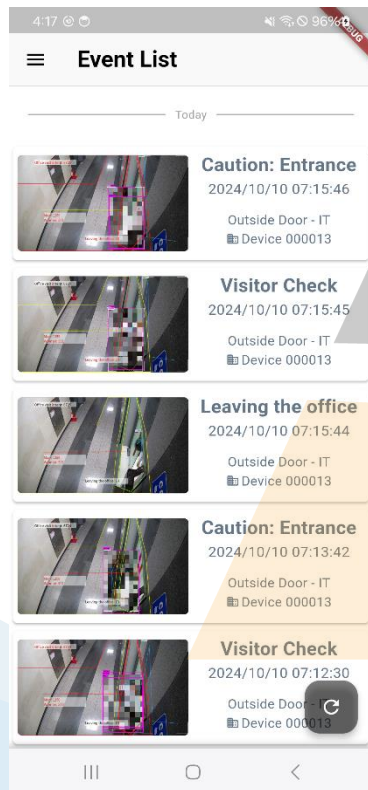
**Intelligent Traffic Systems**



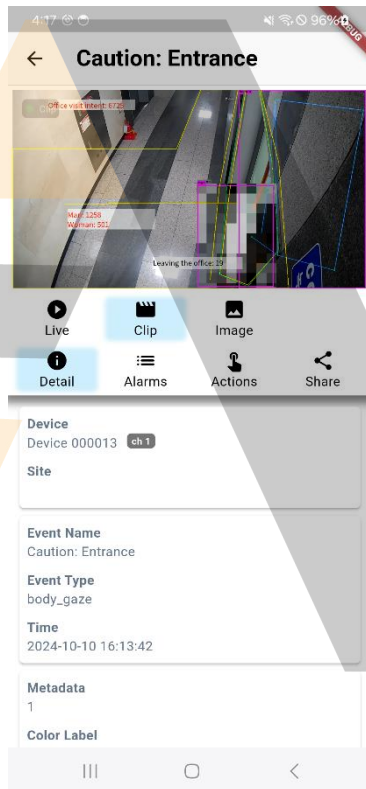


# Mobile App

## Event List



## Live / Playback / Actions



## Sharing Snapshots



User accounts and event lists are managed by the cloud, while live, playback videos, and snapshots are directly sent to the mobile app via P2P.

# SSD Functions – Built-in GUI

## Live View & Playback

이벤트 검색으로 돌아가기

CH1

이전 이벤트

다음 이벤트 >

라이브

채널 1 - Outside Door - IT

재생

다운로드

사무실 나간:0

아래로:12  
위로:11  
Man:22  
Woman:1

객체도착:2

명문자 알림:0

사무실 방문 벽도 감지(계측자):1

사무실 나간:0

아래로:2  
위로:4  
Man:6  
Woman:0

객체도착:1

명문자 알림:0

사무실 방문 벽도 감지(계측자):1

이벤트 정보

시간	영상 소스	이벤트	부가 정보
10/12/2024 13:58:58	CH 1 - Outside Door - IT	Illegal Dumping [불법투기]	

## Timeline Search

홈 / 녹화 / 검색 / 파일 검색

파일 검색

이벤트 검색

파일 검색

< 10월 2024 >

채널 전체

스냅샷

영상 클립

모두

일 월 화 수 목 금 토

1 2 3 4 5

6 7 8 9 10 11 12

13 14 15 16 17 18 19

20 21 22 23 24 25 26

27 28 29 30 31

00:00 03:00 06:00 09:00 12:00 15:00 18:00 21:00 00:00

1

2

3

4

5

6

7

8

0

0

검색

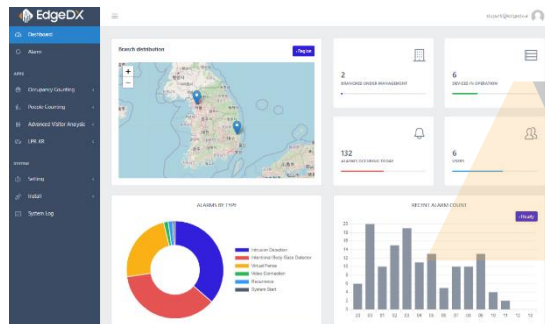
영상 클립

스냅샷

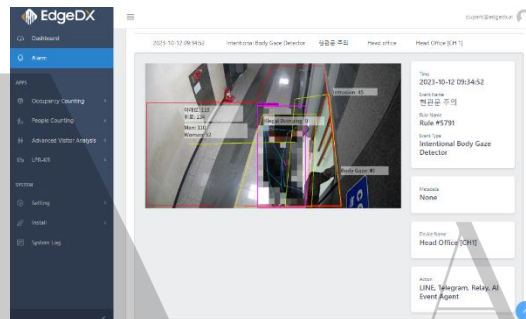
영상 클립 (857)

시작 시간	끝 시간	채널	파일 크기	동작
10/12/2024 00:08:22.982	10/12/2024 00:08:27.627	8	1.1MB	<div>다운로드</div> <div>보기</div>
10/12/2024 00:08:27.900	10/12/2024 00:08:32.584	8	1.0MB	<div>다운로드</div> <div>보기</div>
10/12/2024 00:08:33.096	10/12/2024 00:08:36.650	8	0.8MB	<div>다운로드</div> <div>보기</div>

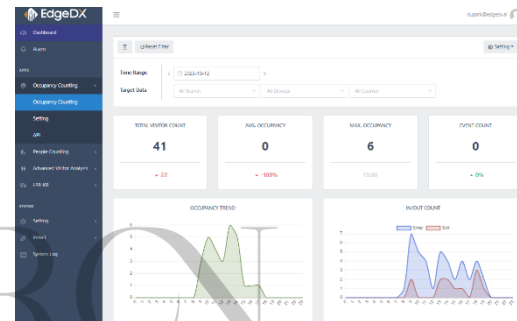
# Cloud application software based on AI Bridge



Dashboard



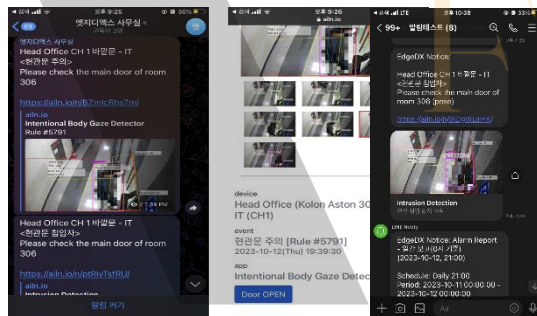
Alarm console



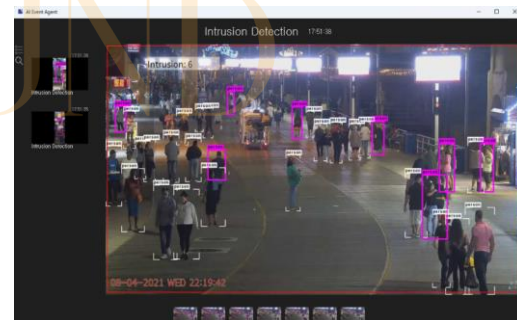
Data visualization  
(Business intelligence)



Device management  
Health check service

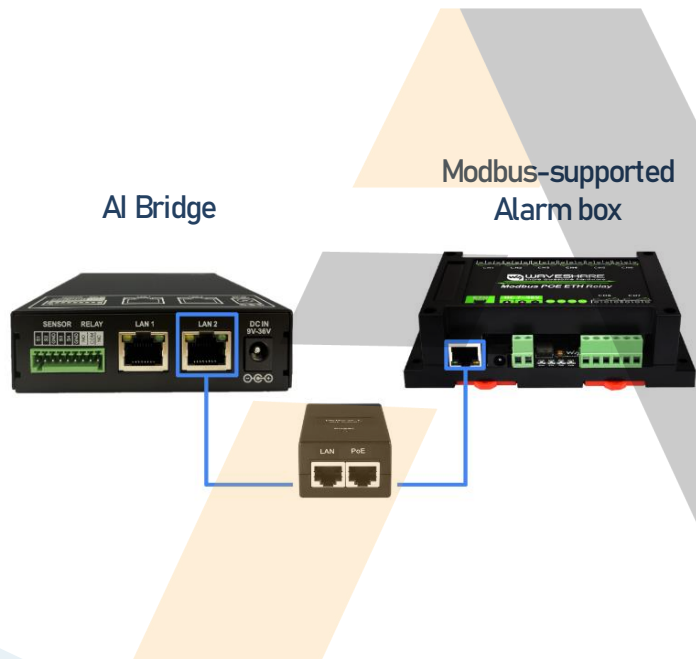


SNS messenger service  
(Google Chat, Telegram, Line)



AI event agent  
(For offline)

# External Alarm Box support via Modbus protocol



Home / Applications / System Event Settings / Modbus

## Modbus

**Modbus Device**

Transport: TCP

Host: 192.168.1.200

Port: 4196

Device Address: 0x 01

Cancel Submit

Modbus Relay (20) [Download CSV](#) [Upload CSV](#)

Id	Name	Function	Start Address	ON	OFF	Test
		0x 05	0x 0000	0x #00	0x 0000	
1	Modbus Relay 1	0x 05	0x 0000	0x #00	0x 0000	ON OFF
2	Modbus Relay 2	0x 05	0x 0001	0x #00	0x 0000	ON OFF
3	Modbus Relay 3	0x 05	0x 0002	0x #00	0x 0000	ON OFF
4	Modbus Relay 4	0x 05	0x 0003	0x #00	0x 0000	ON OFF
5	Modbus Relay 5	0x 05	0x 0004	0x #00	0x 0000	ON OFF
6	Modbus Relay 6	0x 05	0x 0005	0x #00	0x 0000	ON OFF

**Modbus Relay States** [Refresh](#)

Modbus Relay 1 2 3 4 5 6 7 8

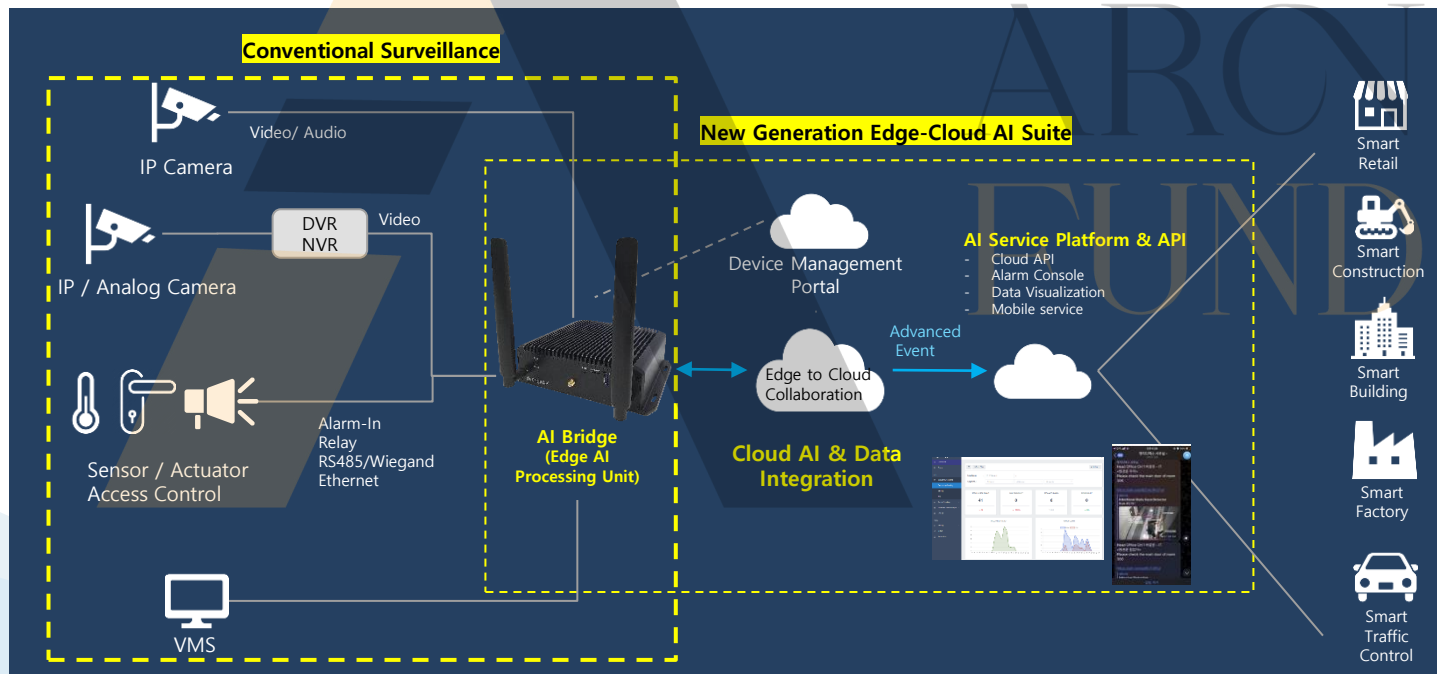


Hybrid AI Boost

ARON  
FUND

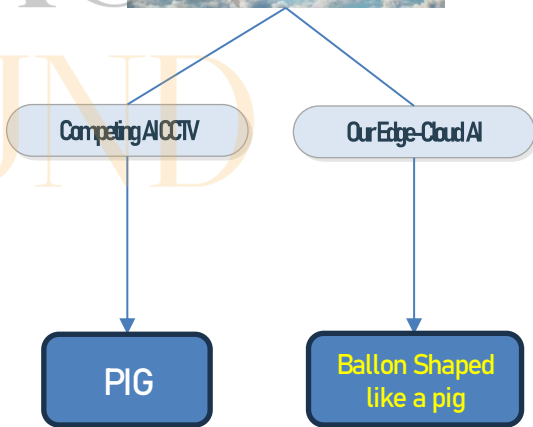
# Roadmap: Hybrid AI Boost - Towards 99%+ Accuracy with Most Efficient Data Management!

- EdgeDX **Hybrid AI Boost** integrates edge processing and cloud intelligence for real-time surveillance and analytics, with human-level understanding capabilities
- The AI Bridge performs real-time video processing, while the Cloud AI provides advanced analysis with a comprehensive knowledge base



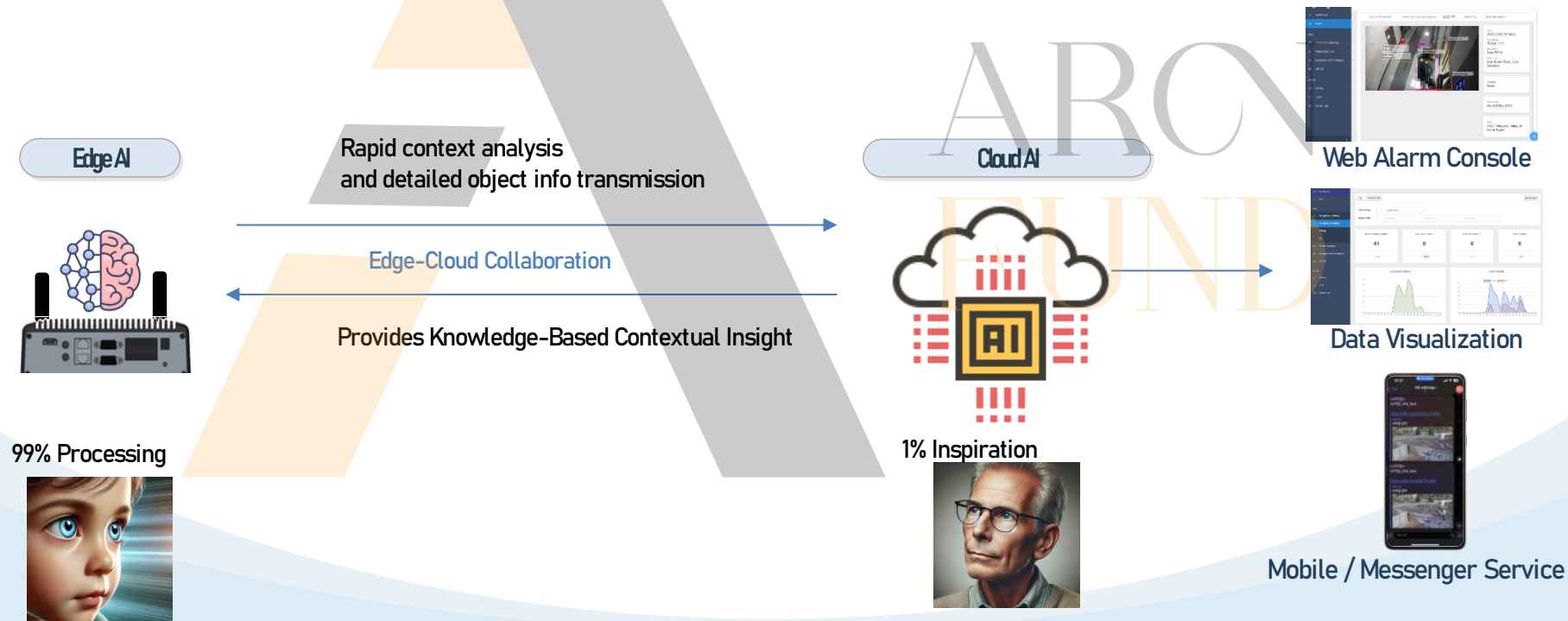
# AI CCTV vs Hybrid AI Boost - The Knowledge Difference

- Competing AI CCTV: Current AI CCTV from other providers might see this pig balloon and classify it simply as an animal because it only knows pre-defined categories like animals, humans, cars, and bikes.
- Hybrid AI Boost:** Our hybrid model recognizes that it's a balloon shaped like a pig. It understands context—pigs don't float in the sky with strings attached. It knows about balloons, strings, and the sky, allowing it to make a more accurate identification.
- Human Perception vs AI:** Humans instantly recognize the balloon due to a broader knowledge of object interactions and contextual awareness. The next-gen AI aims to mimic this type of human-like reasoning.



# How our Edge-Hybrid AI Boost works - Synergy between Edge AI and Cloud AI

- AI Bridge-based Edge AI: Accurate detection of pre-defined objects and real-time processing
- Cloud-based Knowledge AI: Deep reasoning based on a wide knowledge base
- **Hybrid AI Boost** (Together): Cost-effective with human-like performance





# How Hybrid AI Boost outperforms traditional AI CCTV in context awareness

## Training Way of Current AI CCTV

### Learning from pre-defined objects



## Training Way of New Edge-Cloud AI

### Learning from images with detailed descriptions



Two people on the mountain



Young woman cooking in kitchen with vegetables

### Invisible Knowledge from websites, books

- ✓ Carbon monoxide is dangerous to humans
- ✓ Tools should be handled with care

## Hybrid AI Boost sees context, making human-like decisions.



- ✓ Current AI: Person
- ✓ New AI: A man in a suit walking on a tightrope, indicating a risky scenario



- ✓ Current AI: Old Man
- ✓ New AI: Child aged 4-7 dressed as an elderly person



- ✓ Current AI: Kids
- ✓ New AI: Two young children are dangerously playing with power drills



- ✓ Current AI: Fallen Person
- ✓ New AI: Worker collapsed due to carbon monoxide poisoning (Using Multimodal input)

# Edge-Cloud AI Suite - OCR capability for enhanced monitoring



Edge-Cloud AI Suite

- Container Number: L5QU 107737 9 JP 4300
- Maximum Gross Weight (MAX GW): 30480 kg (67200 lb)
- Tare Weight: 3860 kg (8510 lb)
- Maximum Cargo Weight (MAX CW): 26620 kg (58690 lb)
- Cargo Capacity (CL CAP): 67.70CBM (2389CBF)

# AI-driven video analytics - Safety Management



Farm  
Hannong

Hybrid AI Boost at Farm Hannong

- Client: The biggest Korean agricultural company (Farm Hannong)
- Project Organizer: SK group (Shieldus), and ADT Korea
  - SK group: 139 BUSD revenue conglomerate company
  - ADT: 2<sup>nd</sup> largest security company in Korea
- Mission: Industrial accident prediction & prevention
- Applied AI algorithms: No Helmet, Fallen Person Detection
- Outstanding Result: Over 99.5% (Fallen: 99.97%)



AI app	Aggregation period	Rate	
		Detection	False detection
No Helmet	2024.05.29~2024.06.02	99.51%	0.49%
Fallen Person	2024.05.29~2024.06.09	99.97%	0.03%

# AI-driven video analytics – Wild Animal Detection

## Hybrid AI Boost – Animal Detection (Deer) – Japan

The screenshot displays a web application interface for AI-driven video analytics, specifically for Wild Animal Detection. The interface is divided into several sections:

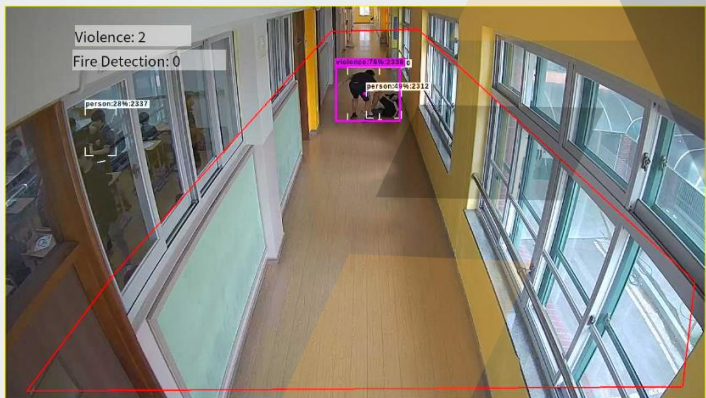
- Sidebar Menu:** Located on the left, it includes options for Dashboard, Alarm, Live Alarm, Alarm Search, SYSTEM (Setting), and ADMIN MENU (System Admin, Experiment, System Log).
- Main Video Feed:** The central area shows a live video feed from an IPC (Intrusion Prevention Camera) at 2024/10/10 20:06:08. The video shows a dark, wooded area with a deer visible in the lower right corner.
- Details Panel:** Located on the right, it provides information about the detected event:
  - Device:** Device B00150 CH 1
  - Site:** (Empty)
  - Event Name:** 動物検知 (Animal Detection)
  - Event Type:** Animal Detection
  - Time:** 2024-10-10 20:06:10
  - Metadata:** None
  - Color Label:** None
  - Action:** Relay, Email
  - Rule Name:** Rule #7555

A large, semi-transparent watermark "ARON FUND" is overlaid across the center of the video feed.

# AI-driven video analytics - Aggression Detection and Teacher Notification System

- Client: Dae-Gun Mid School, Korea
- Purpose of Installation: Detect students fighting in the hallway and notify teachers

Hybrid AI Boost Success at Korean School



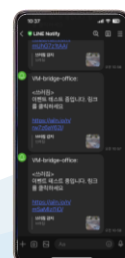
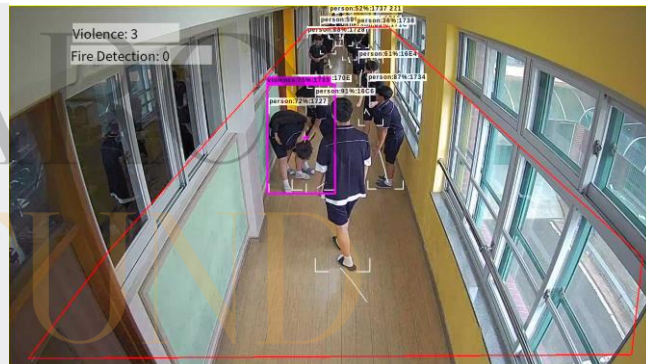
Device  
Device B00042 CH 3  
Site

Event Name  
폭력행위 감지  
Event Type  
Aggressive Detection  
Time  
2024-09-03 14:05:37

Metadata  
None  
Color Label  
None

Action  
NX, LINE  
Rule Name  
Rule #2730

Advanced Analysis  
TRUE



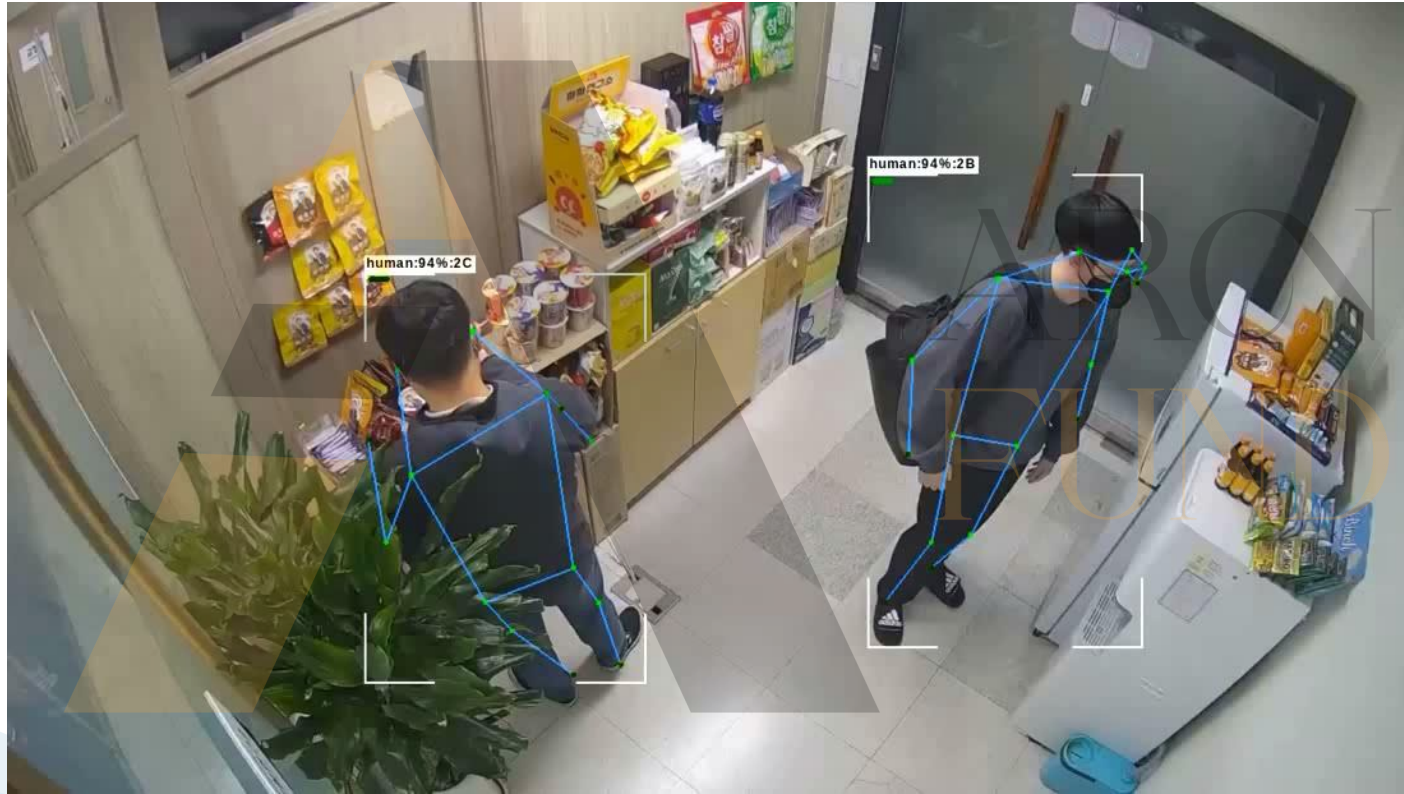


# Hybrid AI Boost - Algorithm Test Videos for Application Potential

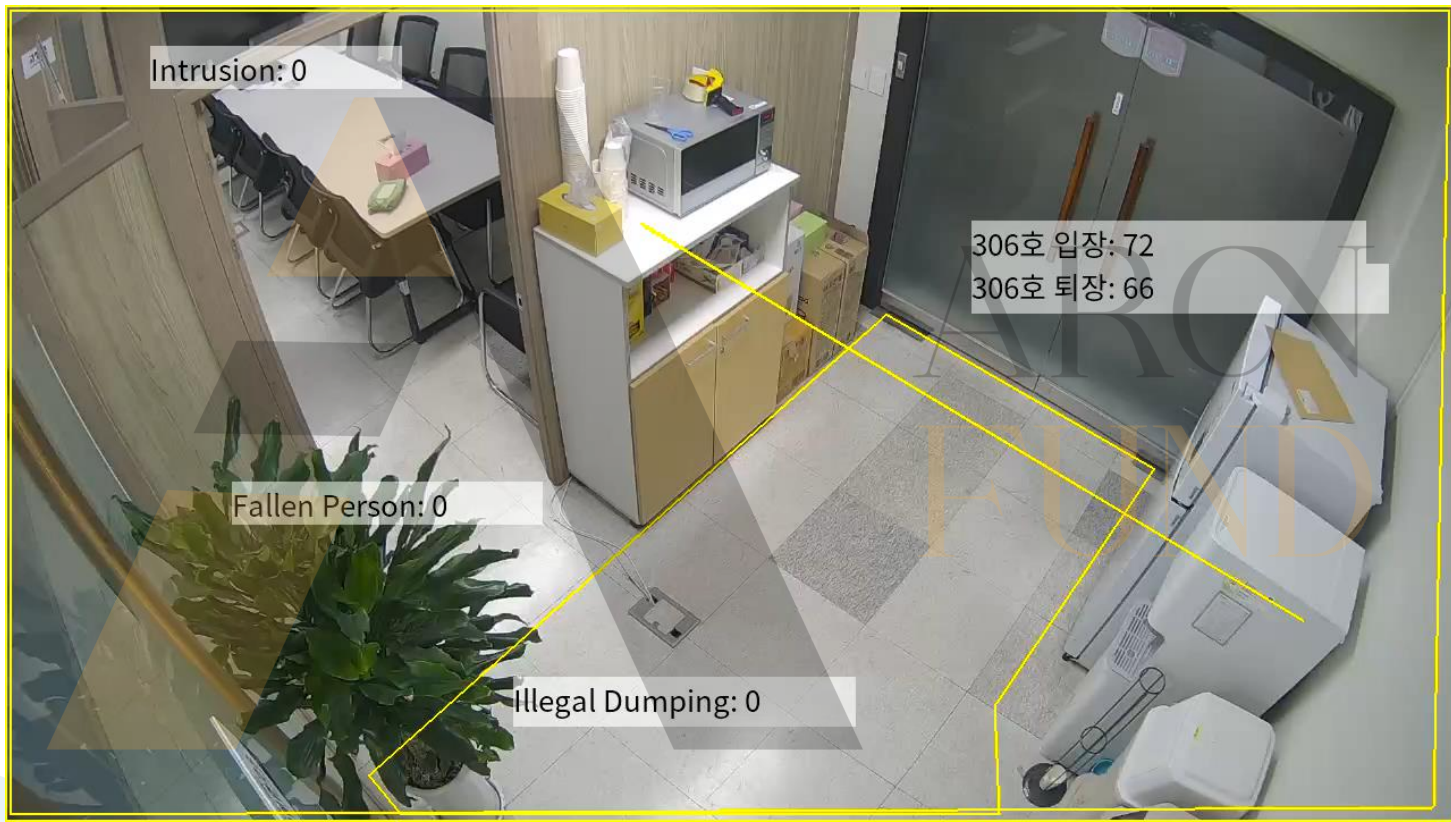
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# Hybrid AI Boost – Revolutionary Shoplifting Detection with Behavioral Analysis



# Intrusion with an umbrella-carrying person (on AI Bridge)

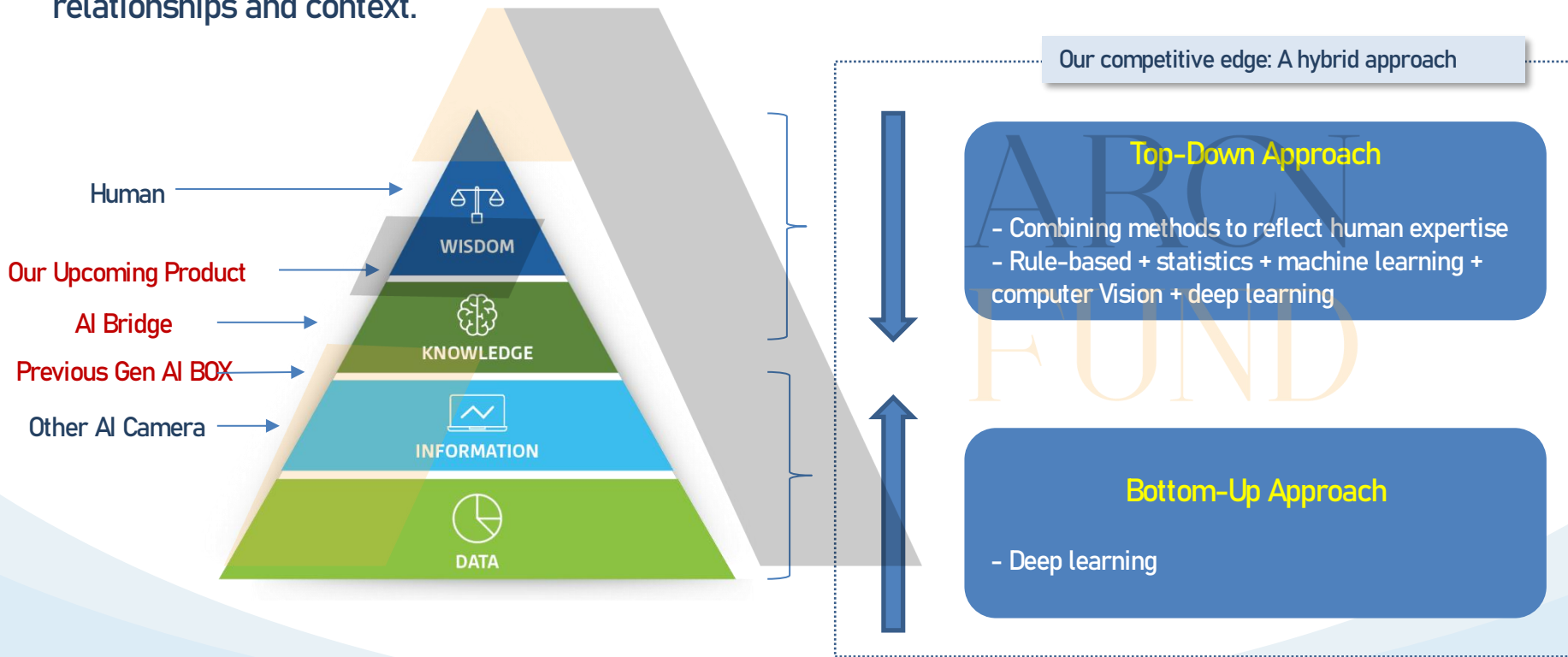


- Test result: An umbrella-carrying person is perfectly detected.



# Our competitive Edge-AI algorithm

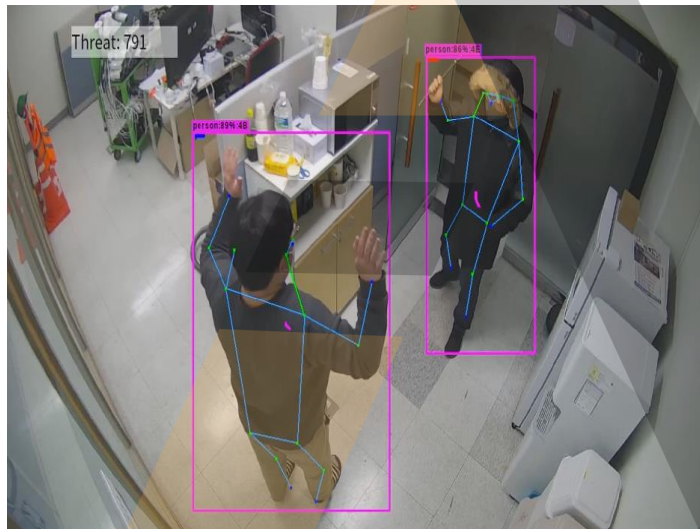
Our advanced AI enhances detection accuracy while reducing false alarms by understanding object relationships and context.



Bottom-up: Multi-level deep learning models / Top-down: Multi-level analysis algorithms

# Knowledge-Based Object Analysis

Our AI Bridge is designed to understand relationships between objects based on human knowledge



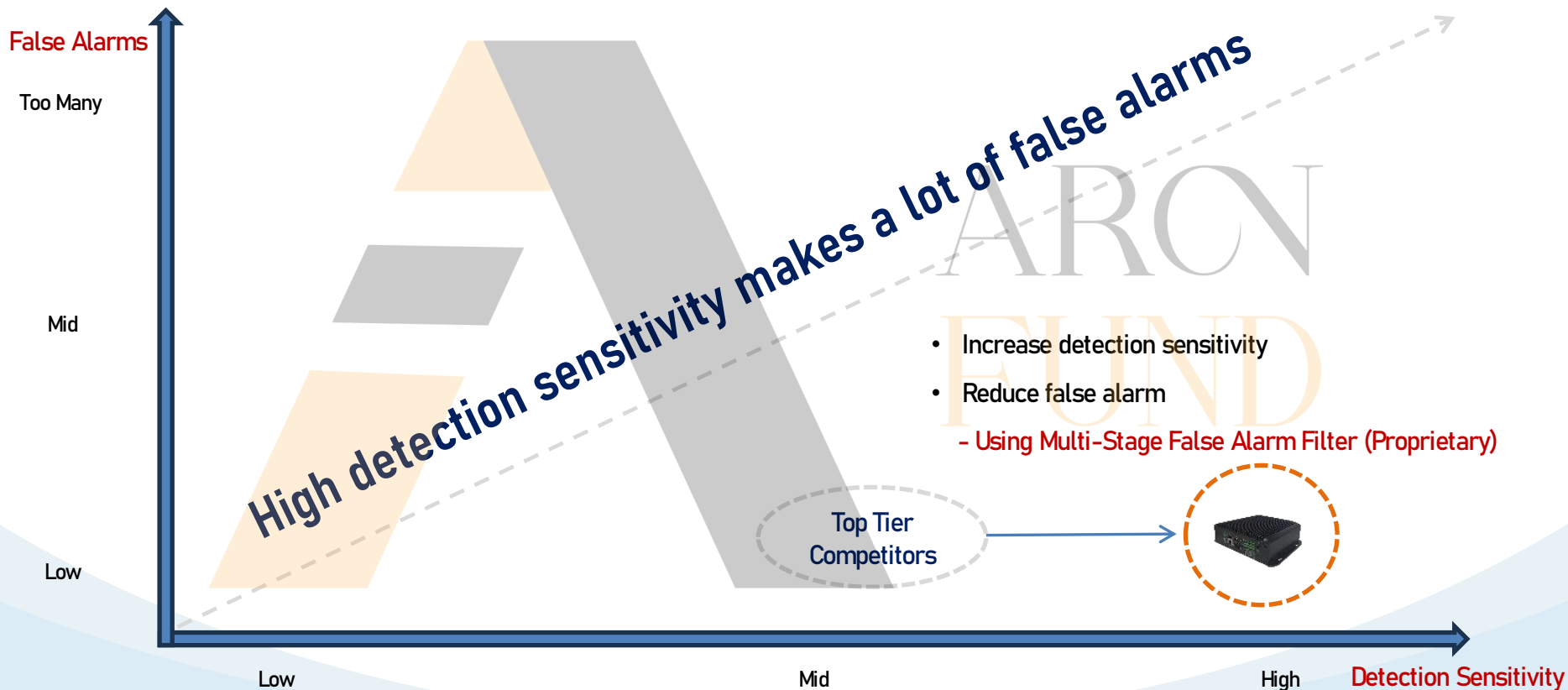
Human's Knowledge level

VS



Data / Information level

# Optimized Detection Level

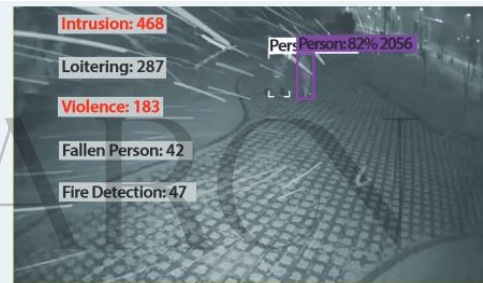
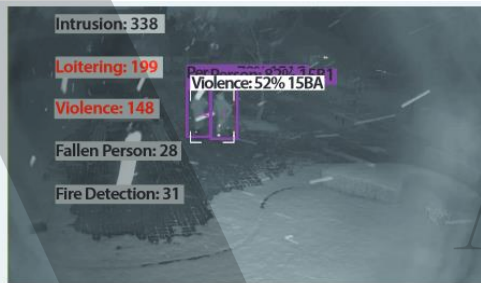
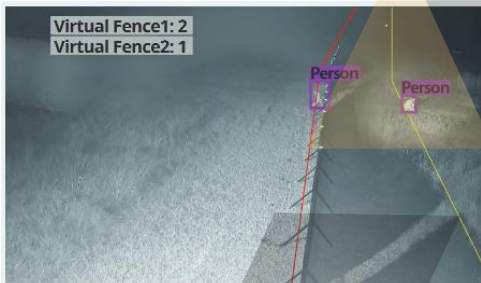


# Precision Detection with Smart Filter

Outstanding detection performance

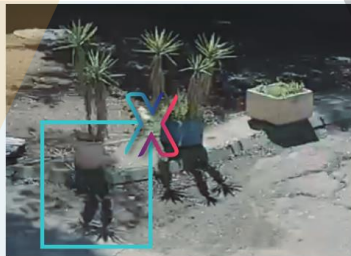
## Superior detection

- Any environment; any extreme challenging scene



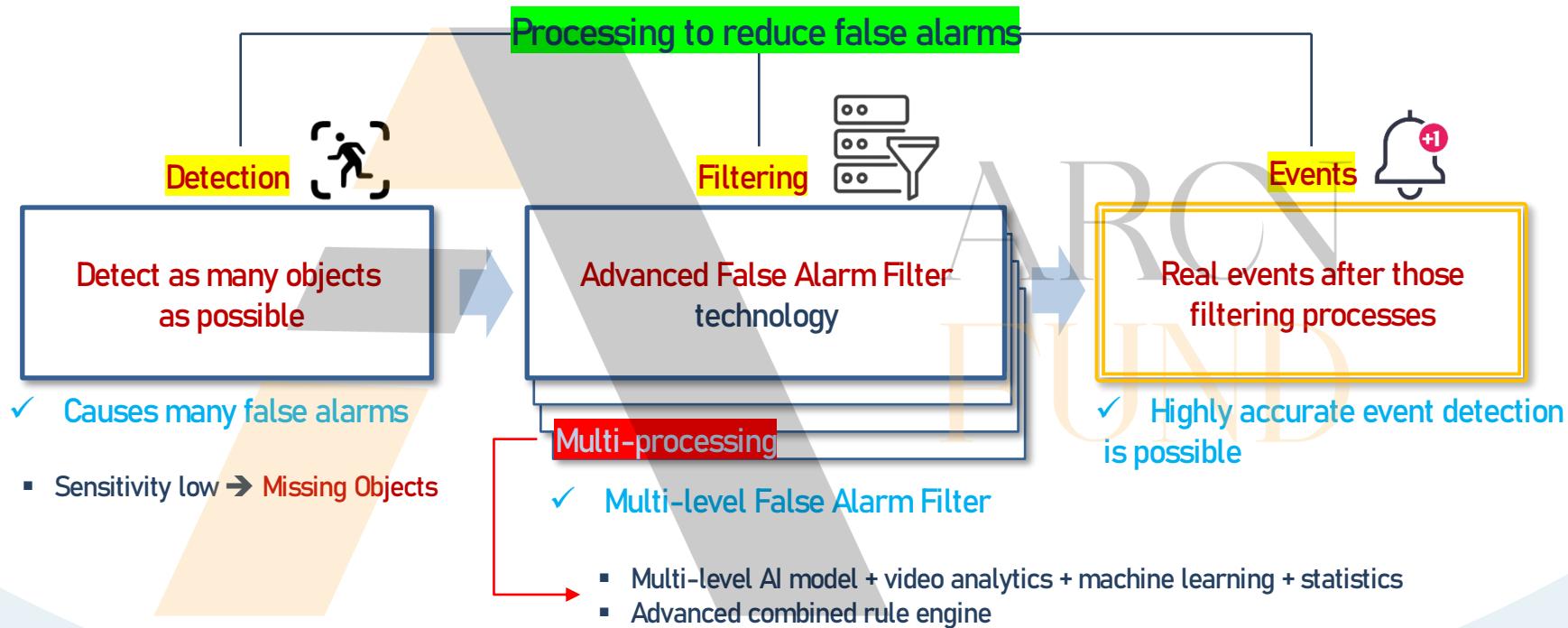
## Multi-stage false alarm prevention filter

- No struggling with annoying notifications
- Real object notifications



# Multi-level Filter Architecture

Overcome false alarm through multiple filters

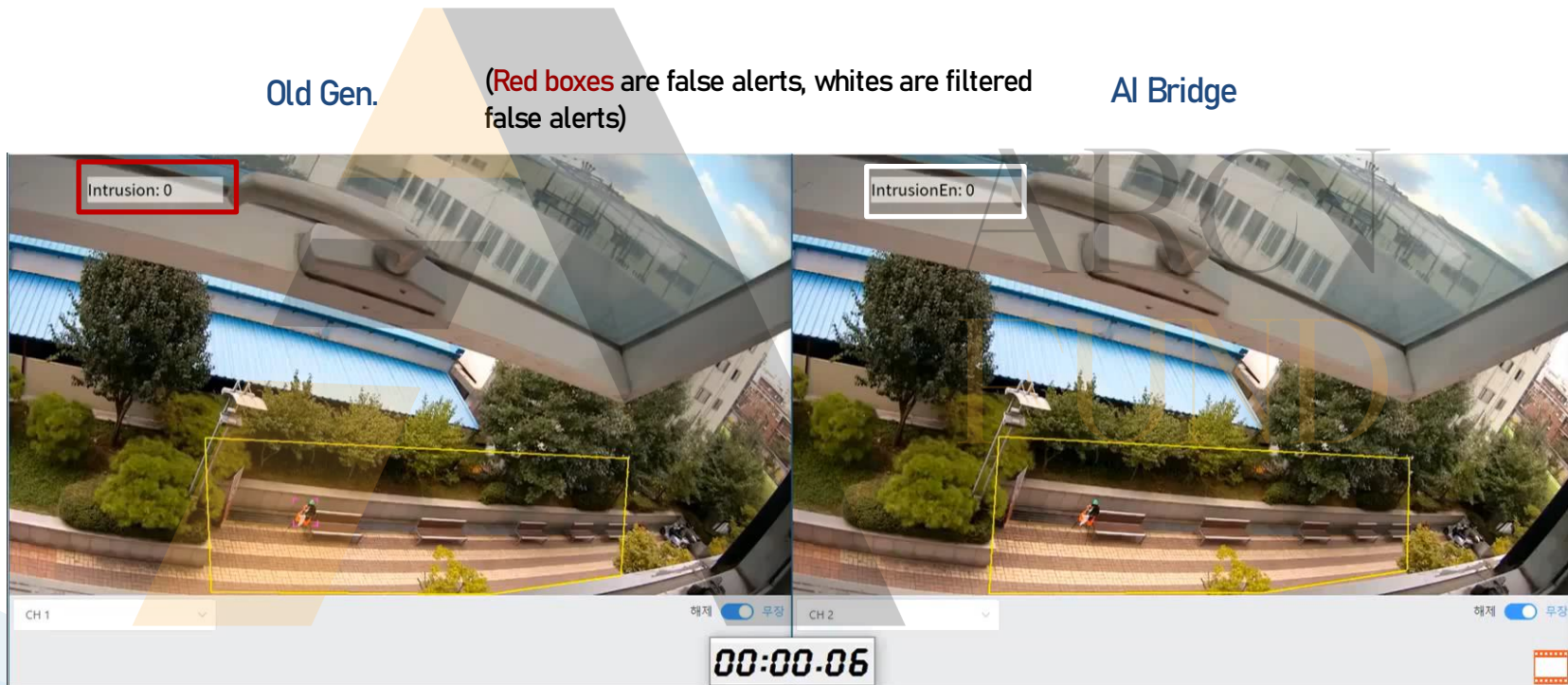


# Application 1 – Precision Detection

Comparison to old Gen. AI Box

Demo video

- Overall 'Scene Understanding' through anti-false alarm technology.



- Actual scenes may have a lot false alarm factors – wind, lights, object angles.



# Application 2 - Precision Detection

Customer real use case - Parking lot

Old Gen. (9 false alerts in 16 min.)

AI Bridge (0 false alerts)



It won't be 0% false positive alarms, but the AI algorithms are designed to minimize the rate.

Item	False alarms per day	
	16 minutes	Calculated for a day
Old gen.	9	810
AI Bridge	0	Negligible level

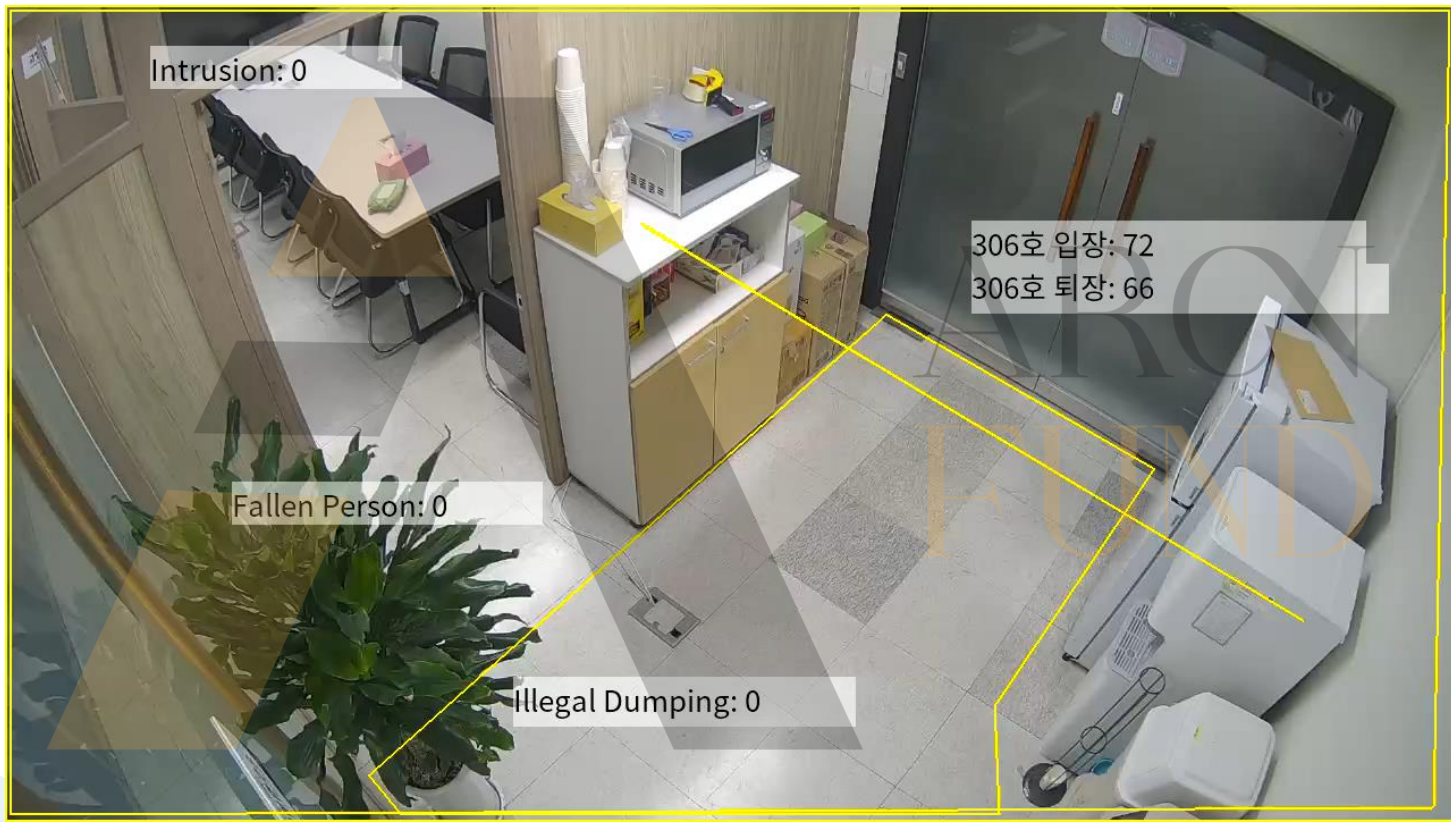
# Challenging Environment

Example: Multiple apps in extremely challenging environment





# Intrusion by an umbrella-carrying person (AI Bridge)



- Test result: An umbrella-carrying person is perfectly detected.

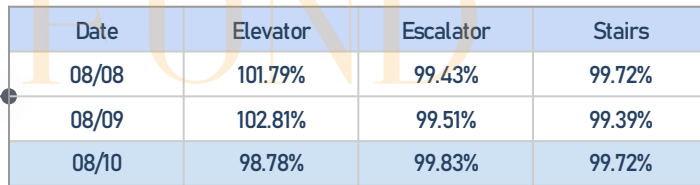


## Success Stories (Use Cases)

ARON  
FUND

## People Counting (Line Crossing)

- 
- The screenshot displays a 'People Counting (Daily)' dashboard. At the top, a title 'People Counting (Daily)' is centered. Below it, four summary cards are arranged in a 2x2 grid:
- TOTAL:** 1214 (with a red trend indicator showing an increase of 1673).
  - HOURLY AVERAGE:** 101 (with a red trend indicator showing an increase of 10).
  - SUGGEST TIME:** 10:00 (noted as '(Yesterday) 11:00').
  - EVENT COUNT:** 0 (noted as '(Yesterday) 0').
- Below the summary cards are two bar charts, both titled 'NUMBER OF PEOPLE'. The left chart shows data for 'Today' (blue bars) and 'Yesterday' (light blue bars) over a 24-hour period. The 'Today' data shows a sharp peak around 10:00, reaching nearly 8000 people. The 'Yesterday' data is mostly flat, with a small peak around 10:00 reaching about 1000 people. The right chart shows the same data for 'Today' and 'Yesterday' over a 24-hour period, but with a different scale, showing a peak around 10:00 reaching about 1000 people for 'Today' and about 500 for 'Yesterday'.



- Auto set tracking point through AIB basic setting
- Any existing camera and any angle
- **The highest score** among competitors

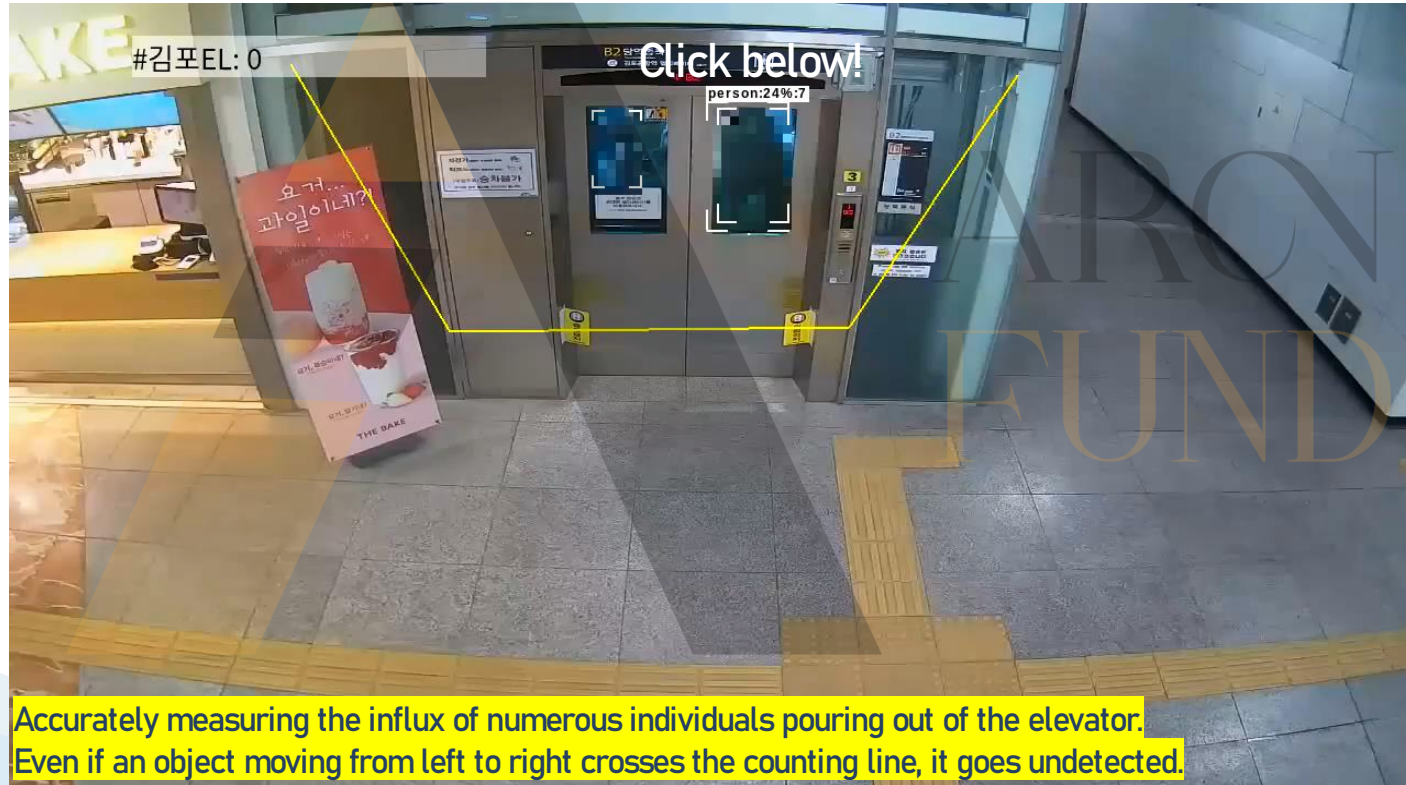
# AI-driven video analytics - Public Safety Management

## People Counting - Line Crossing



# AI-driven video analytics - Public Safety Management

## People Counting - Elevator





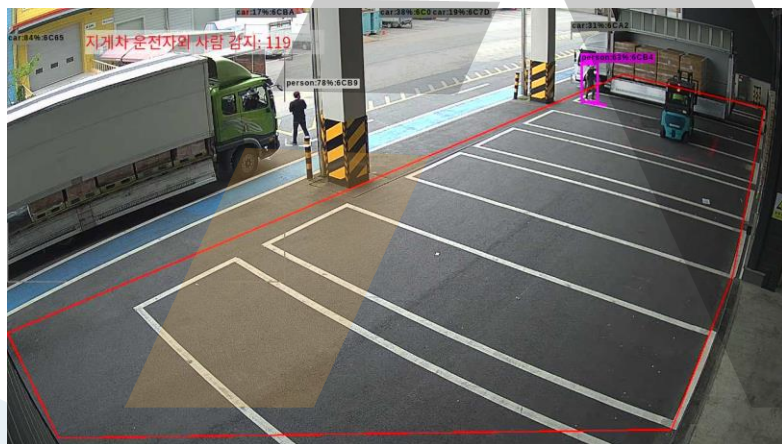
# AI-driven video analytics - Pedestrian detection excluding forklift operators

## Forklift Non-Driver Detection

**SERVEONE**

**SAMSUNG**

에스원



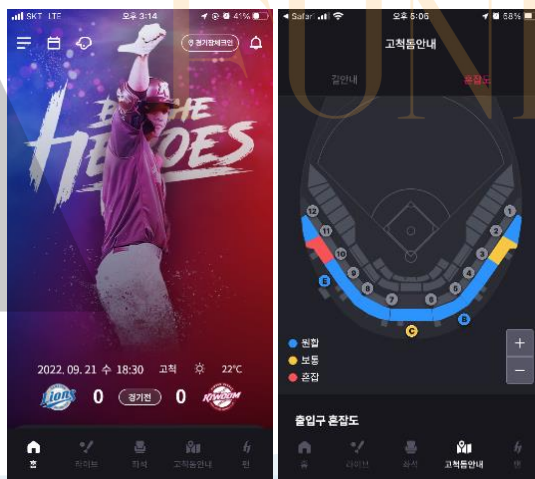
# AI-driven video analytics - Baseball Team Stadium Management

## Manage crowded venues

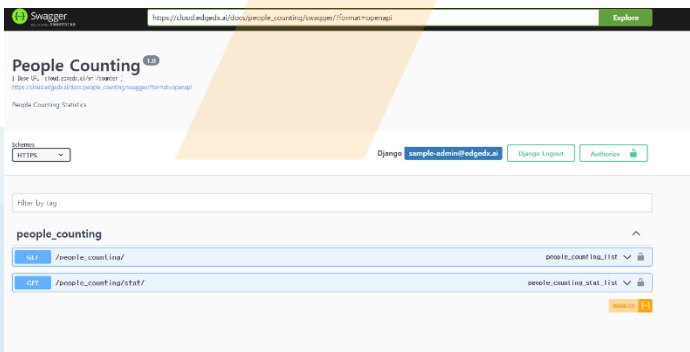
- Client: Korean pro-league baseball team **HEROS** stadium
- Project requirements: Service running on legacy app
  - Well-aggregated data as an easy API
  - API qualification: Swagger
- Mission: Value added on the legacy app (Convenience service)
  - Crowded points notifications for fans
  - Notification Points: Rest rooms, stores, exits, bleachers
- Applied AI algorithms: People counting, crowd detection



HEROS's Home - Seoul Gocheok Sky Dome stadium



HEROS mobile App (Ticketing, transportation, schedule) with value - **crowd points service**





# AI-driven video analytics - Commercial Vehicle Management

- Client: The biggest Korean construction materials company
- Project requirements: Commercial trucks in/out bounding management
  - Materials management
  - Trucks in / out bounding management
- Mission: Advanced automatic truck management
  - Truck LPR, in & out time management
  - Construction materials loading & unloading management
- Applied AI algorithms & Service:
  - AI Algorithms: Vehicle detection, LPR with time
  - Service: EdgeDX cloud service (history management, reporting)



Customized Cloud Platform

**TONGYANG**

70 year old company

Platform deployments : 16 factories and their 105 partners

## [Benefits]

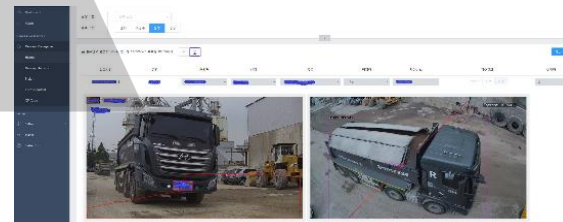
Confirmation of aggregate import quantity

Generate/send reports in case of discrepancies

Cost-saving on manpower



Dashboard



History

## License Plate Recognition, Line Crossing

## Discrepancy Report



# AI-driven video analytics - Logistics Warehouse

- Client: Samsung S1 warehouse
- Organizer
  - Samsung S1: Korea's No.1 security vendor
- Mission: Overall PPE regulation check
  - Labourers in forklifts must have helmets
  - Forklifts, Human in the forklift, Helmet detection required
- Applied AI algorithms: Human detection, Forklift detection, Helmet detection



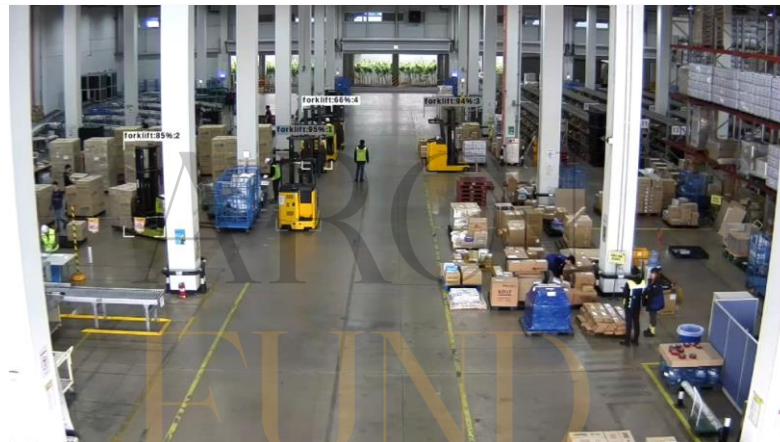
No. 1 cause of casualties through accidents at SMB manufacturers

- Forklifts (767 casualties in 5 years)
- Based on Korean Ministry of Employment and Labor

SAMSUNG

에스원

## Forklift Operator Safety



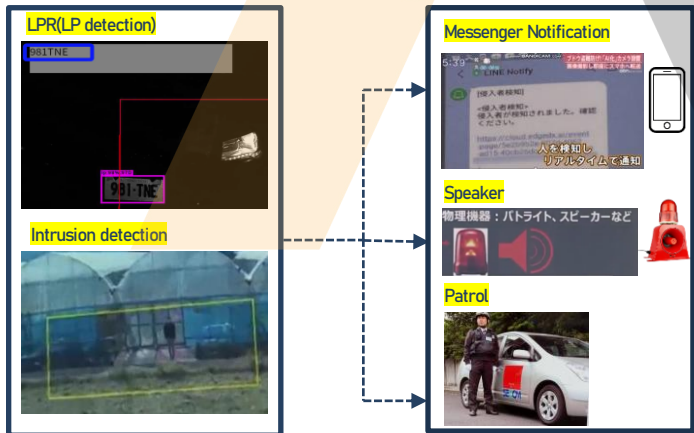
Forklift - No helmet

At the S1 warehouse

# AI-driven video analytics - Anti-Theft Solutions)

## Prevention of Agricultural Product Theft

- Target: Grape farm, Nagano, Japan
- Organizer
  - Secom in Japan: Japan & Asia's no. 1 security vendor
- Mission: Protection from 'Shine Muscat' theft
  - Multiple scenarios & algorithms required.
  - Japan No. 1 messenger support (Line: 96m. users)
- Applied AI algorithms: LPR, Animal/ Intrusion/ Loitering detection, Illegal parking



Prevention of **total annual loss of \$ 10,000** from each farm

- ✓ Not post-incident
- ✓ Immediate real-time response is possible



# AI-driven video analytics – Traffic Accident Prevention

## Roadside Sudden Event Detection: 0% False

- Client: Korean ITS system
- Organizer: Ministry of Land, Infrastructure & Traffic (Korea Government)
  - Purpose: Unpredictable circumstances management for ITS
- Mission: Over 300 ft. detection in low-light conditions
  - Less-visible people detection (black-wearing)
  - Over 300 ft. object detection (Vehicles & Persons)
  - Any time/ Anywhere/ Any environment
- Applied AI algorithms: Fine-tuned and optimized AI algorithms

⑤ 평가기준 : 자동차·도로교통분야 ITS 성능평가기준(국토교통부 고시 제2021-1056호, 2021.09.01.)

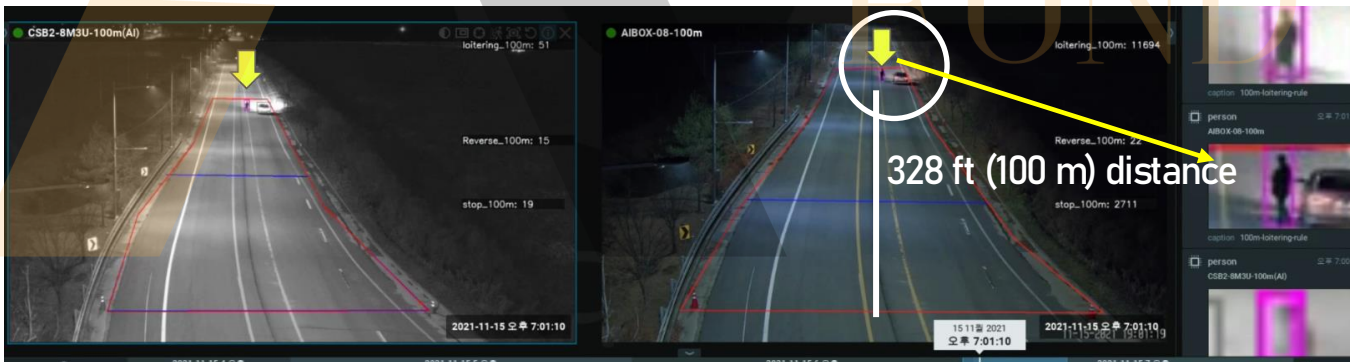
[별표 6] 돌발상황 감지시스템 성능평가 기준

### ④ 평가결과

구분	평가기준(%)	100m	200m	평가기준(%)	100m	200m
정검지율(%)		100.0	최상급	100.0	최상급	최상급
다문유형검지율(%)		0.0	최상급	0.0	최상급	최상급
평가결과		정검지율(%) = 정검지율(%) + 다문유형검지율(%)				
오경보(건/일)		0/1	최상급	0/1	최상급	최상급
평가장소		[ ] 일반도로	[ ] 교량	[ ] 터널	[ ] 기대시행도로	
날씨		[√] 맑음	[ ] 흐림	[ ] 구름	[ ] 기타( )	
음영지역		평가대상장비 설치지점 ~ 30.0m				

평가기간 : 2021년 11월 22일(13:00) ~ 2021년 11월 25일(13:00)

- Unexpected situation detection within 328ft (100M) & 656ft (200M) distance
- Correct Detection Rate 100%, False Detection Rate 0%
- Cloudy/Clear, Day/Night, 4 days test
- 100% passed: Only one (EdgeDX) embedded type AI device





# AI-driven pose estimation - overall performance

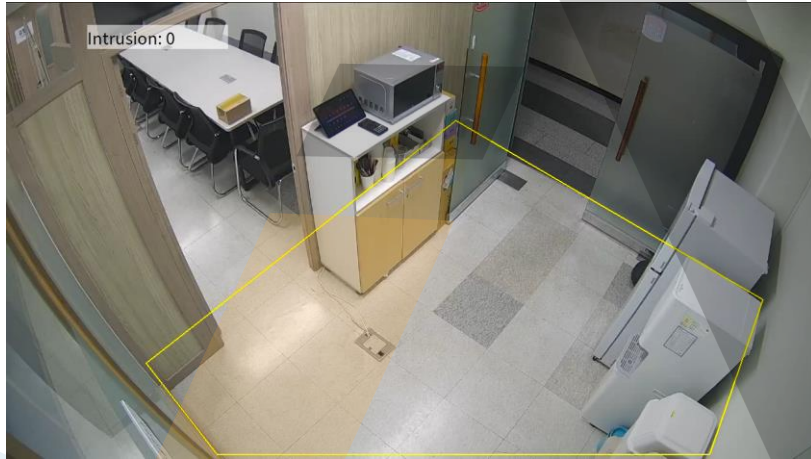
[Demo video](#)



# AI-driven video analytics – Perimeter Security

## Intrusion Detection

Identify individuals in restricted areas, issue alerts, and trigger a range of responses.





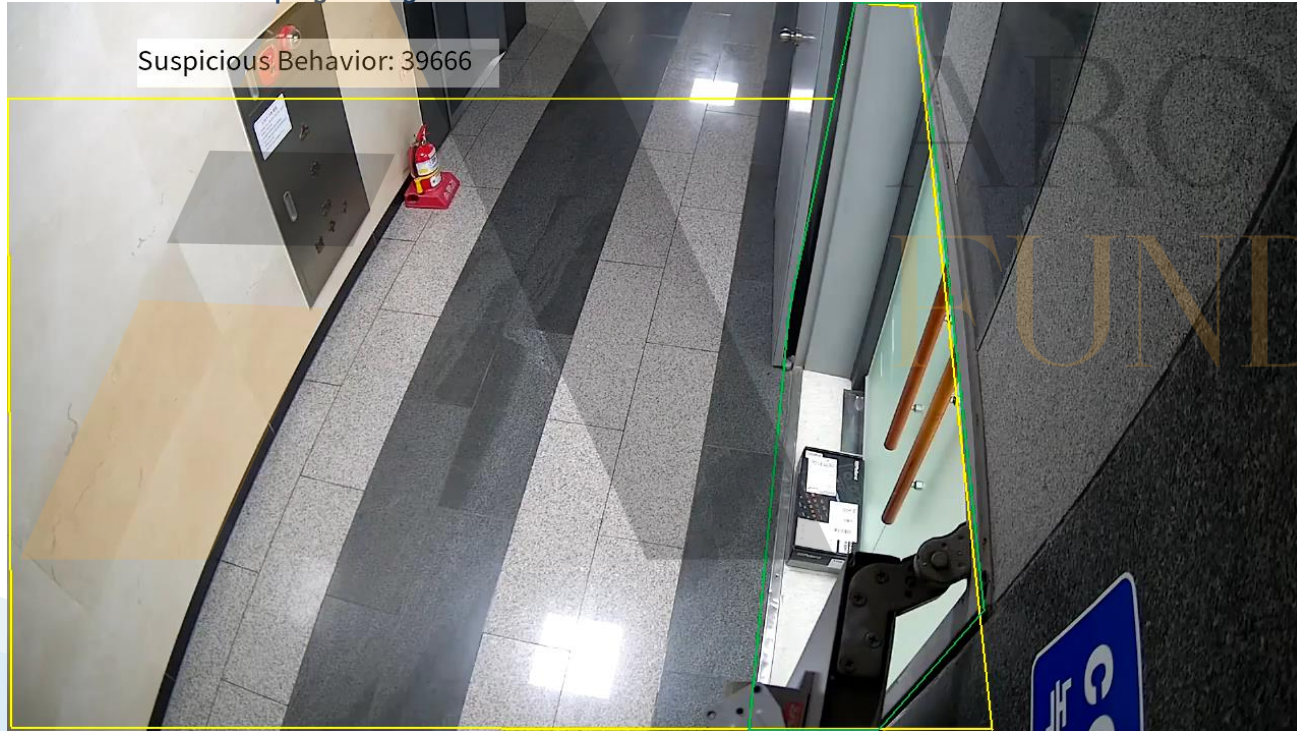
# AI-driven video analytics – Perimeter Security

Intentional Body Gaze Detector



Hand & Foot Intrusion

The direction of the body detects a person who is intentionally focusing their gaze in a specific direction. Detect someone who is interested in the exhibits in a show window or snooping through someone else's window.



# AI-driven video analytics - Perimeter Security

Virtual Fence



Loitering, Hand & Foot Intrusion

Set up virtual perimeters around critical assets or facilities to consistently monitor and actively detect any attempted breaches.



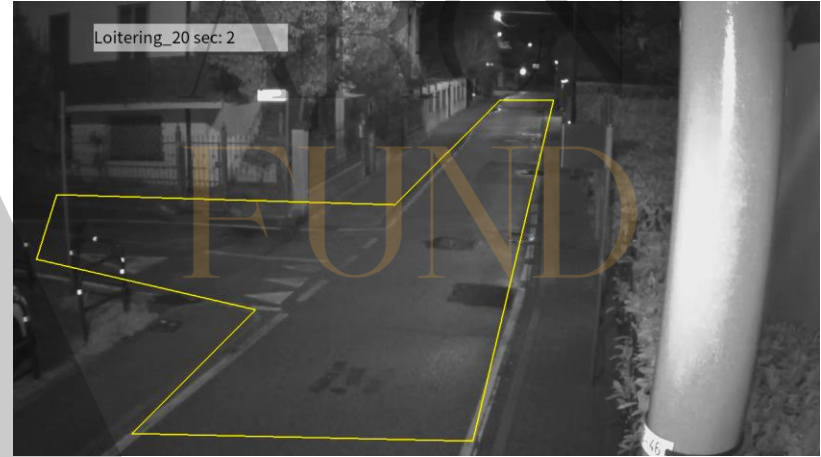
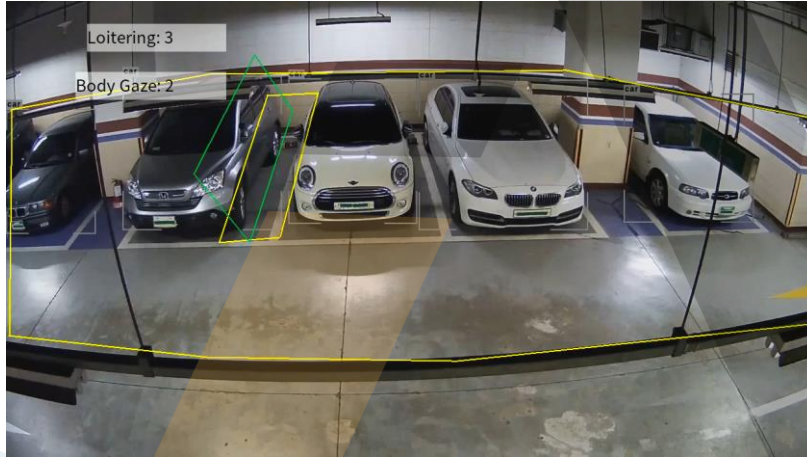
# AI-driven video analytics - Perimeter Security

Loitering Detection



Body Gaze Detector

Detect people, cars, bikes loitering in certain areas. It can enhance security by detecting suspicious behaviour.







# AI-driven video analytics – Public Safety (Building Management)

## Occupancy Counting

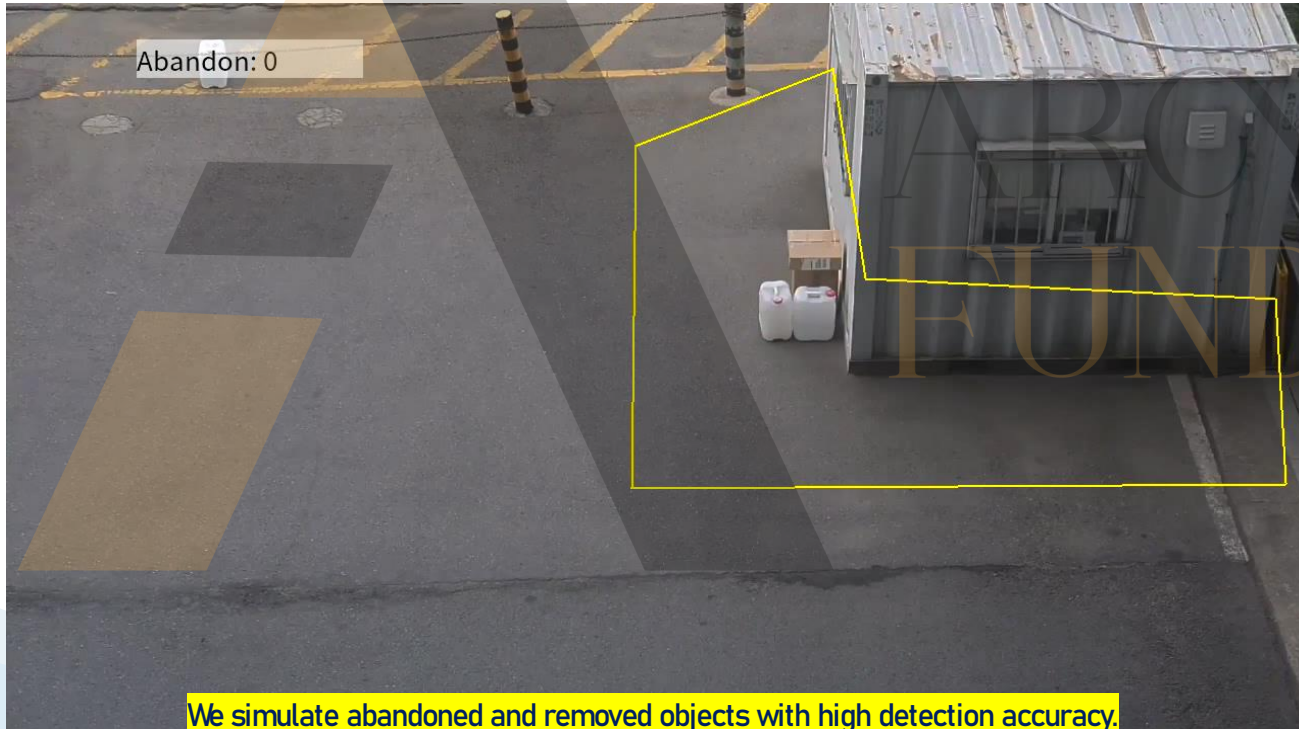
Calculates the number of people in the building by adding up entry and exit counts.



# AI-driven video analytics – Public Safety

## Illegal Dumping

Identify abandoned items. This technology can be utilized to spot hazardous objects or the unlawful disposal of waste.





# AI-driven video analytics – Public Safety

## Illegal Dumping (challenging environment)

Identify abandoned items. This technology can be utilized to detect hazardous objects or illegal waste disposal.



# AI-driven video analytics – Public Safety

## Fire & Smoke Detection (Case 1)

Detect flames and thick smoke in the surveillance area. A fire can spread quickly.



# AI-driven video analytics – Public Safety

## Fire & Smoke Detection (Case 2)

Detect flames and thick smoke in the surveillance area. A fire can spread quickly.

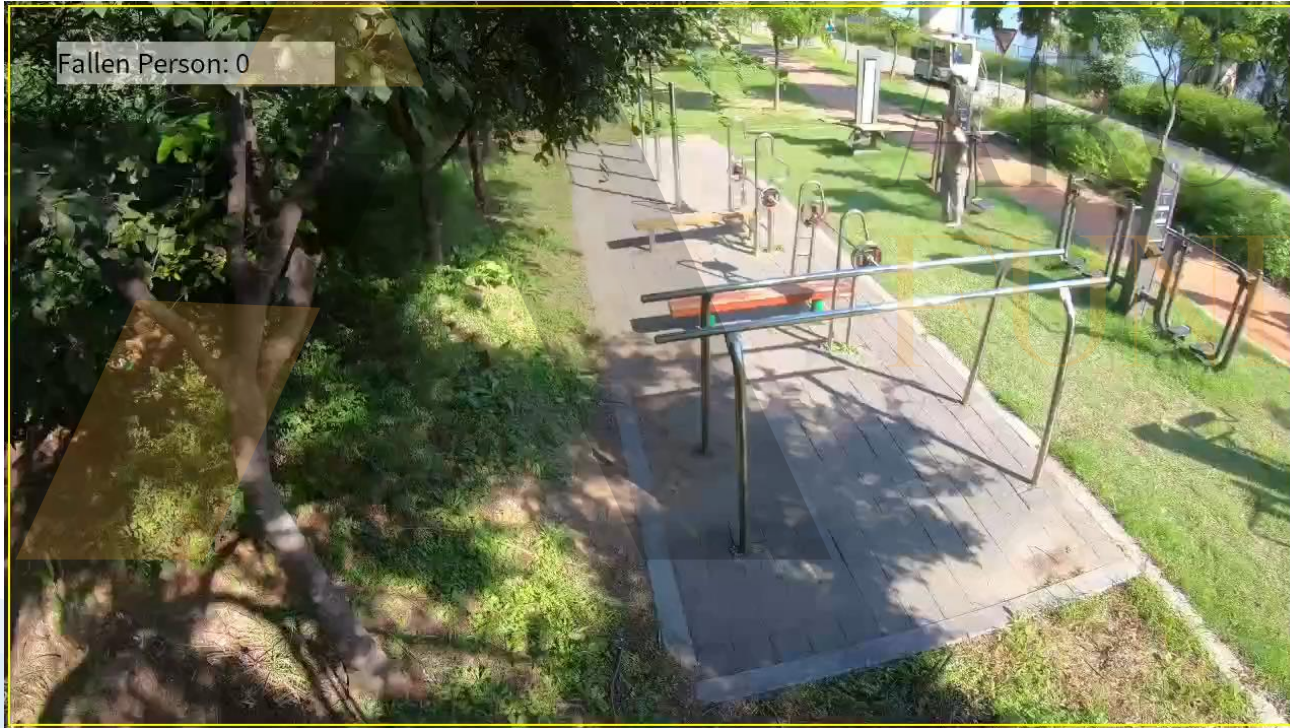




# AI-driven video analytics – Public Safety

Fallen Person

Possible to detect fallen persons accurately even in complex obstacles or various scene conditions.



# AI-driven video analytics – Public Safety

## PTZ Tracking

In CCTV environments, PTZ cameras track objects and maintain their size on the screen.



# AI-driven video analytics – Advanced Public Safety

## Blacklist Cars and Illegal Dumping

- Client: Any location requiring illegal dumping detection
- Pilot: US East-coast (New Jersey)
  - Through Alarmax distribution customer
- Mission: Blacklist vehicles with illegal dumping management
  - Figuring blacklist vehicles
  - Manage illegal dumping
  - Multiple combined events management
- Applied AI algorithms: LPR, Illegal dumping, Combined rules, SNS messenger notifications (via Telegram)

1st alarm  
with blacklist  
LP

+

2nd alarm  
with illegal  
Dumping

### USA cases

- Non authorized vehicles coming into residential complex
- Disposing trash in the residential complex.



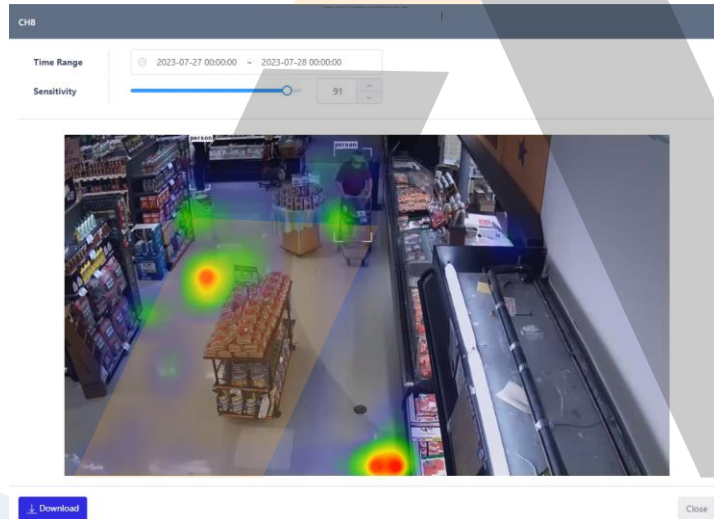


# AI-driven video analytics – Retail Management

## Heatmap

Advanced heatmap technology provides **more valuable marketing insights** by displaying heatmaps when individuals show **interests** in specific shelves, **using human pose analysis**.

Basic heatmap



Advanced heatmap



# AI Video Analysis – Retail Management

## Staff Exclusion

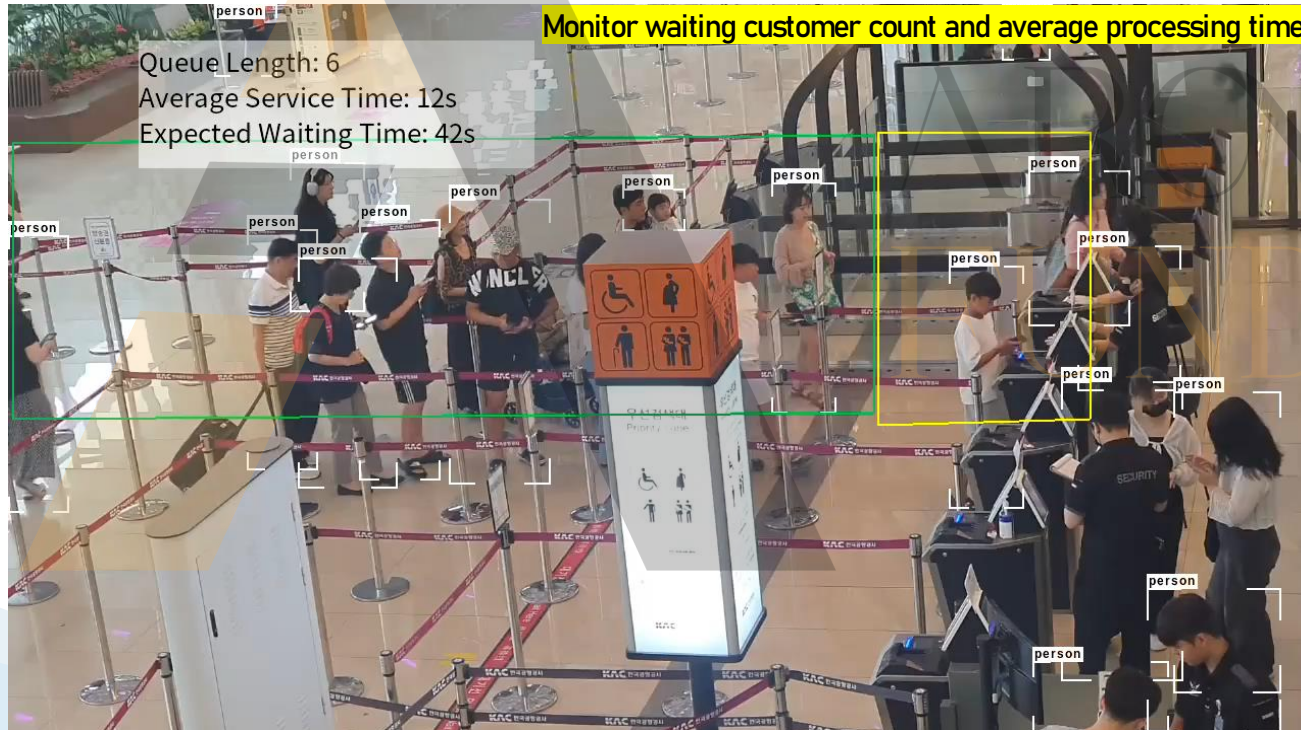
It is possible to count the number of people, excluding staff who are wearing name tags or employee badges.



# AI-driven video analytics – Retail Management

## Queue Management

Queue analysis provides key marketing insights for retail, optimizing staffing and enhancing customer experience.





# AI-driven video analytics – Retail Management (Advanced Attributes)

Advanced Attributes

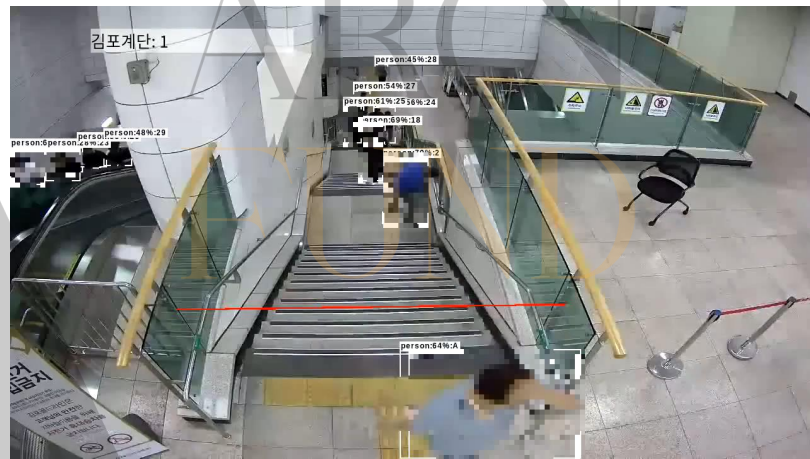
It Identifies detailed information about people, such as clothing color, type, gender, and age group



## Dynamic Privacy Masking

Loitering: 8

In the case of the object where the event occurred, privacy masking is unlocked.



# AI-driven video analytics – Retail & ITS (Parking Space Management)

## Parking Lot Management

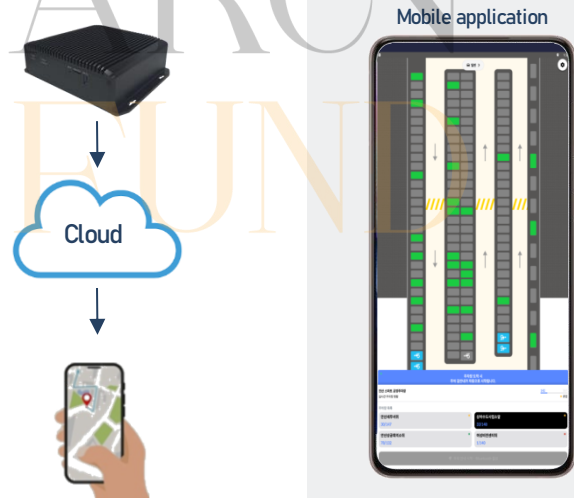
- Vehicle parking recognition
- Real-time analysis of vehicle occupancy in the parking spaces



## End User Application Solutions (Possibility)

### Management of parking spaces

1. Real-time analytics by AI Bridge
2. Collecting data from cloud servers
3. Mobile app service – Available parking spaces
4. Eg.: Gyeonggi-do pilot service

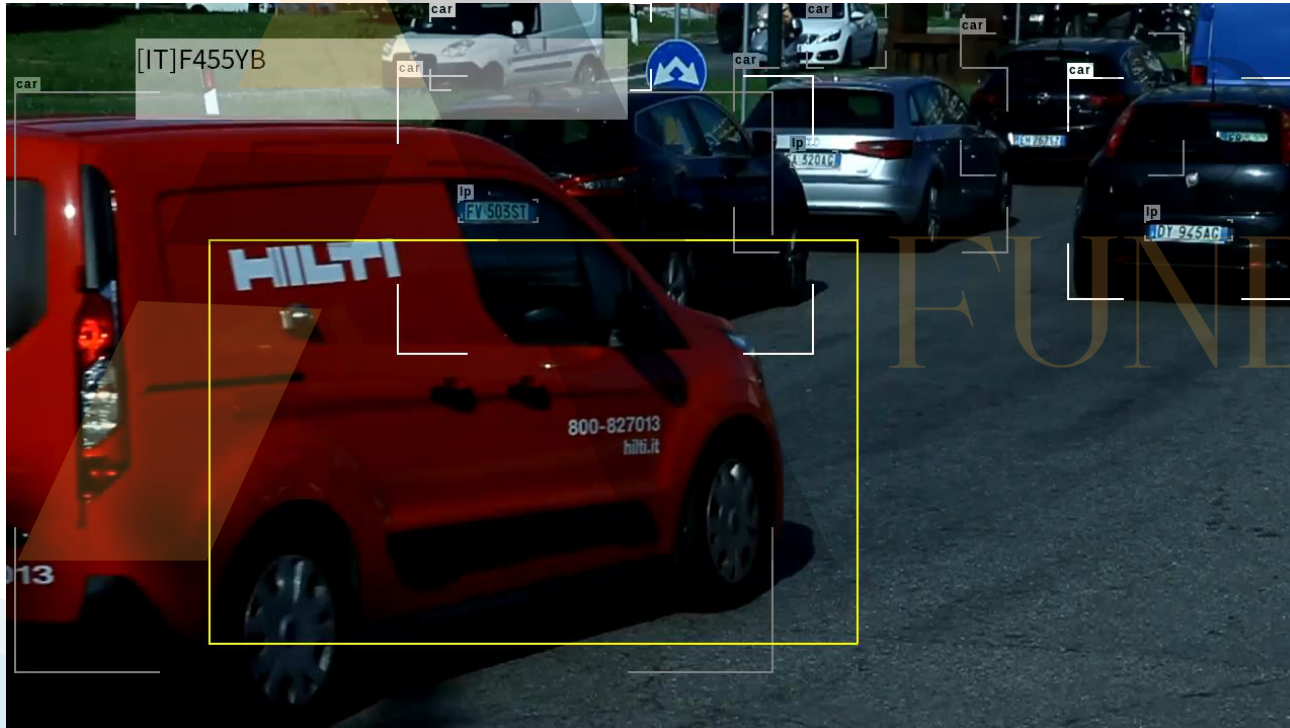




# AI-driven video analytics – ITS (LPR)

## LPR (License Plate Recognition)

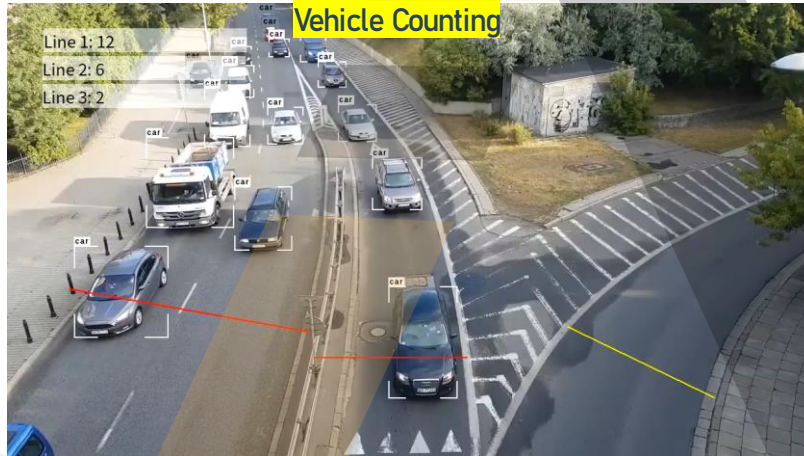
Recognizes license plates and compares them to pre-registered car numbers to generate events such as match/mismatch.



# AI-driven video analytics – ITS (Vehicle & Type Counting)

## Vehicle Counting

The quantity of vehicles that pass by can be counted.



## Vehicle Type Counting

Vehicles such as cars, trucks, buses, bicycles, and motor-cycles can be categorized by type, allowing for an enumeration of each category through various channels.



# AI-driven video analytics – ITS (Illegal Parking)

## Stopping Detection

Detect individuals and vehicles that have stayed in a stationary position for a designated period.

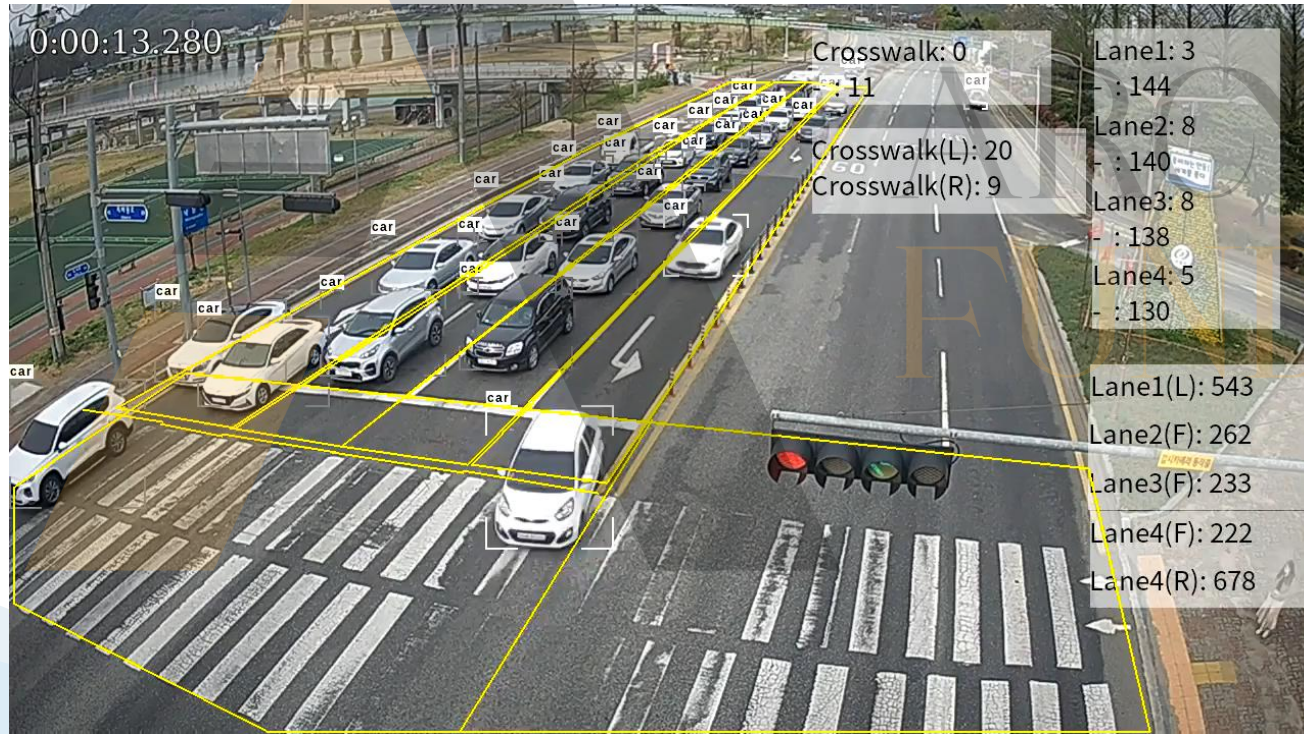




# AI-driven video analytics – ITS (Multiple Management)

## Various AI Apps

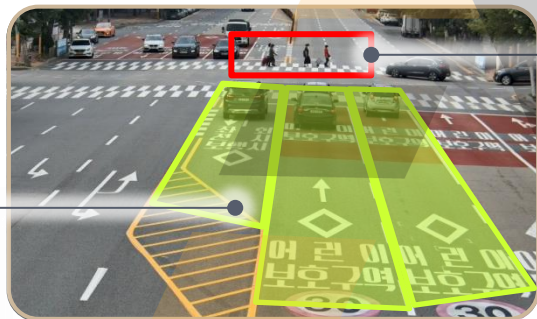
Using various AI apps at road intersections, it's possible to manage vehicle types, directions, and traffic counts.



# AI-driven video analytics – ITS (Smart Traffic)

## Smart Intersection

- Left-turn vehicle volumes
- Pedestrians on the crosswalk

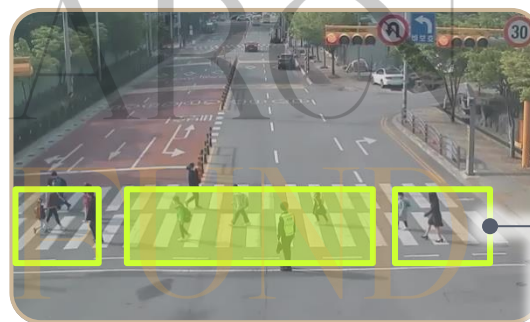


Left-turn vehicle volumes control,  
lane-specific waiting vehicle control

Pedestrians control on the  
crosswalk

## Smart Crosswalk Management

- Detection of pedestrians on the crosswalk
- Display warning alarm or audio broadcast through integration with signal or audio broadcast systems



Pedestrian, child detection by zone

Extending the signal while walking



# AI-driven video analytics – ITS (Smart City Management)

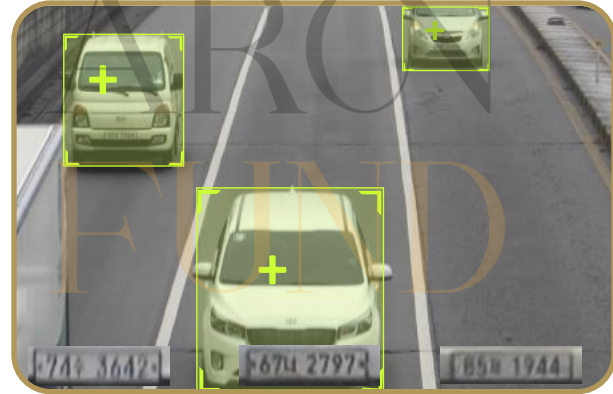
## Road Safety

- Traffic and queue analytics
- Incident monitoring - stop, reverse, pedestrian
- Enable PTZ auto-tracking on event objects with separated PTZ



## LPR (Independent Function)

- License plate recognition
- Simultaneous vehicle number plate recognition up to 3 lanes



# AI-driven video analytics – Safety Management

Remove

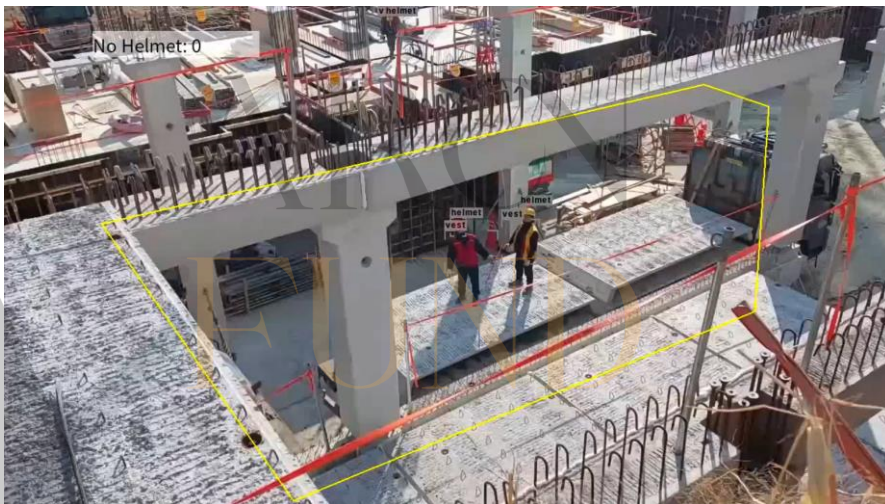
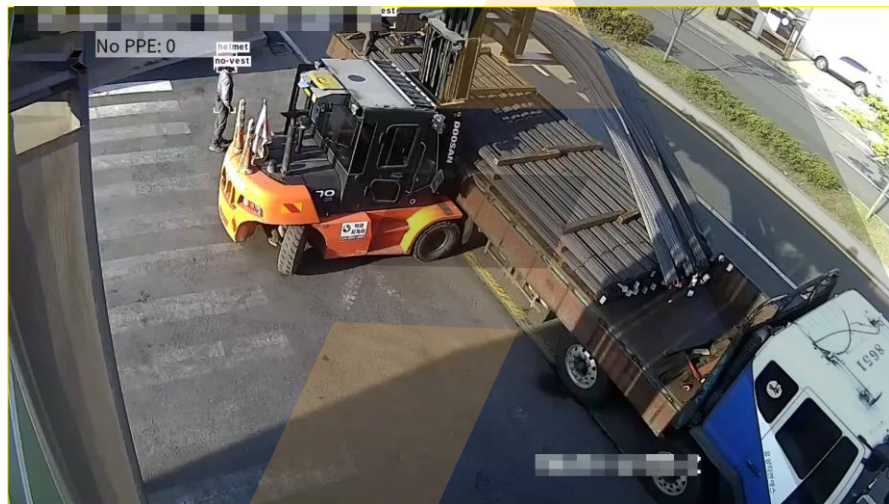
An app using object detection to find missing items in videos can help catch thieves in real time.



# AI-driven video analytics – Safety Management (Construction)

No PPE (Personal Protective Equipment)

Recognizes non-PPE wearing in the surveillance area and sends a warning message to the non-wearing safety equipment or manager.

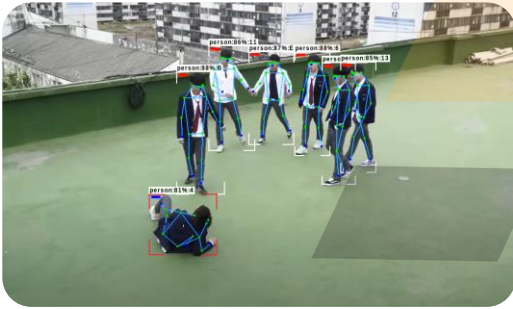




# AI-driven video analytics – Safety Management (School)

## Bullying Detection

AI analysis can detect videos of multiple students bullying one student.



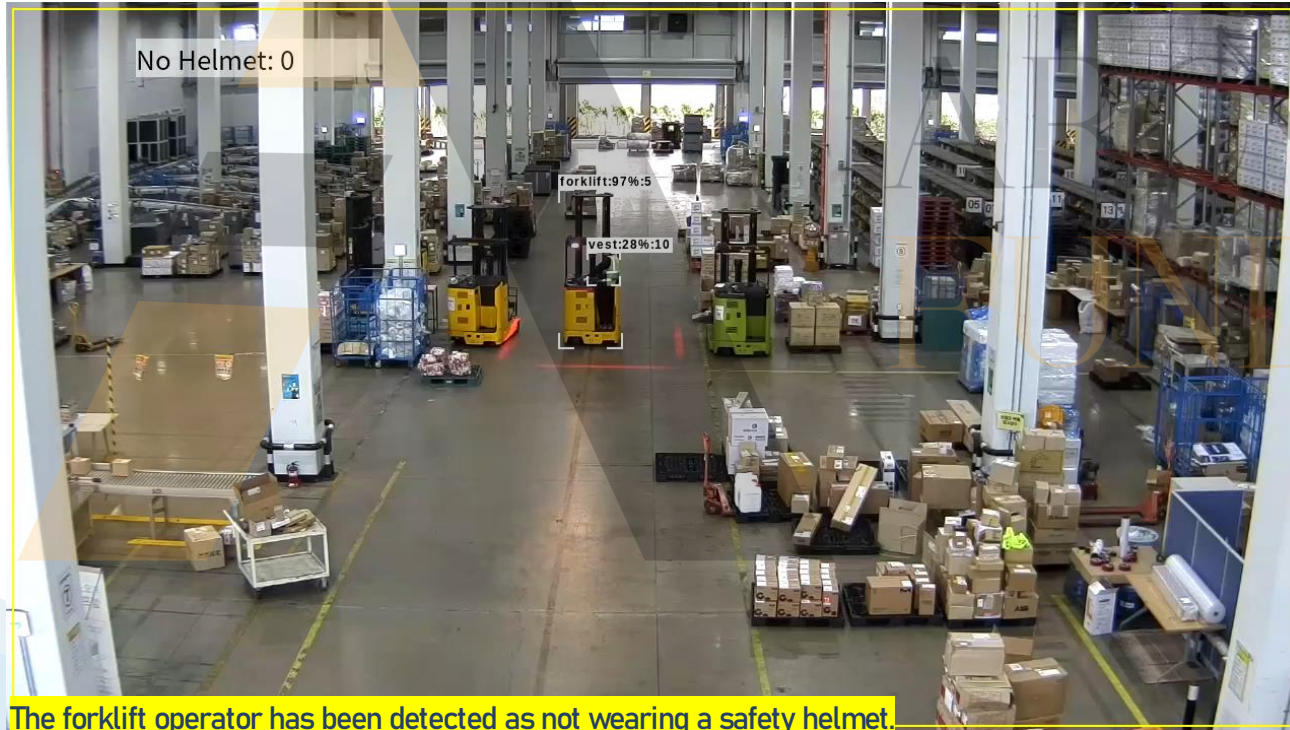
Analyzing scenes where multiple people surround an individual before aggressive actions.



# AI-driven video analytics – Safety Management (Warehouse)

Forklift No Helmet

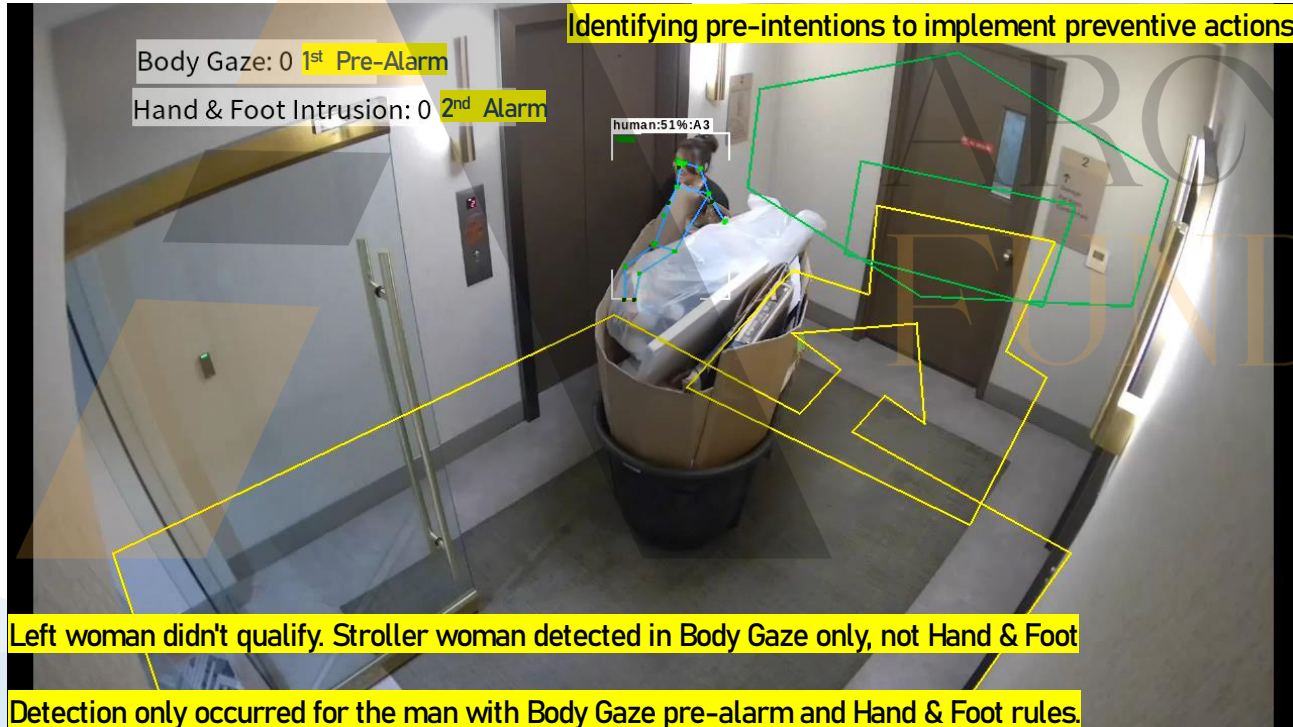
Detect if the forklift driver is not wearing a helmet.





## Multiple AI Apps Combined

This case involves creating composite rules from multiple AI apps to deliver the final event.



# AI-driven video analytics – Special Application (Thermal Intrusion)

Thermal Intrusion Detection

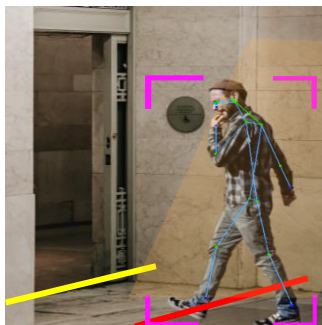
Dedicated human detection using advanced thermal imaging.



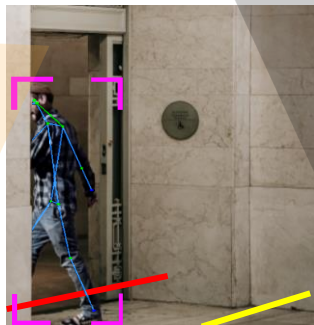
# AI-driven video analytics – Advanced Public Safety (Detecting students leaving school and alerting teachers)

## Vertical Application (more accurate)

- Target: Child care and special care needs
- Mission: Proactive event checking, Major event checking
  - Child care to prevent wrong activities
  - Enable advance measures by administrators
- Applied AI algorithms: Intentional body gaze detector, Hand & foot intrusion, Multiple combined event control, Messenger notification

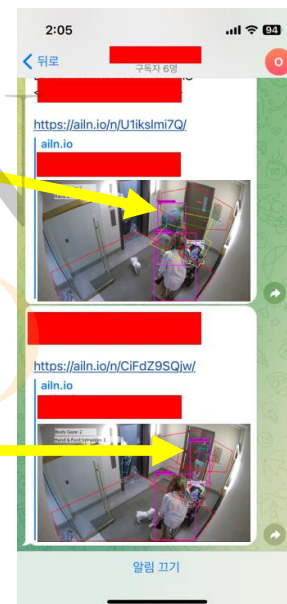


Intentional  
Body Gaze Detector



Hand & Foot Intrusion

By sending alarms in advance during school activity hours to prevent students from going outside, administrators can take proactive measures.



Telegram alarm through  
the cloud service

# Appendix: Product specifications



AI Bridge		AIB-TS2-08 Up to 16-channel	AIB-TE1-04 Up to 4 - CH
Event Action	System Events	Tamper Detection, Alarm In, Video Loss / Recovery, Disarm, Recurrence, Login, System Start	Tamper Detection, Alarm In, Virtual Alarm In, Video Loss / Recovery, Disarm, Recurrence, Login, System Start
	Action Handlers	HTTP, TCP, FTP, E-mail, S3, VMS, Onvif, Audio Back Channel (Camera speaker)	HTTP, TCP, FTP, E-mail, S3, VMS, Onvif, Audio Back Channel (Camera speaker)
	Combining Rules with Other Events	Yes	Yes
	Pre/Post snapshot	Yes	Yes
Video	Annotated Video Stream	Yes	Yes
	Max. Video Input resolution	4K @ 60 fps (2M @ 240 fps)	4K @ 30 fps (2M @ 120 fps)
	Video Input Method	RTSP, RTSP over HTTP/S, Onvif	RTSP, RTSP over HTTP/S, Onvif
	Supported Input Video Format	H.265 / H.264	H.265 / H.264
	Video Output Stream Method	RTSP over TCP/UDP, RTSP over Websocket, RTSP over HTTP/S	RTSP over TCP/UDP, RTSP over Websocket, RTSP over HTTP/S
Audio	Recording(Video, Snapshot)	- 1 x M.2 M-Key Slot (for M.2 2280 NVMe SSD) - Recording license 8-ch(OPTION)	- 1 x M.2 M-Key Slot (for M.2 2280 NVMe SSD) - Recording license 4-ch(OPTION)
	Audio Input	1 x Audio Line-In, (0K0hm, 1Vrms), (3.5mm audio phone jack)	1 x Audio Line-In, (0K0hm, 1Vrms), (3.5mm audio phone jack)
	Audio Output	1 x Audio Line-Out, (6000hm, 1Vrms), (3.5mm audio phone jack)	1 x Audio Line-Out, (6000hm, 1Vrms), (3.5mm audio phone jack)
Interface	USB	1 x USB3.0	1 x USB2.0
	RS-485	1 x RS-485 (Full-duplex 4line T/B)	-
	RS-232	1 x RS-232 (D-SUB9)	-
	Wegand	1ch input / 1ch output	-
	LAN	2 x 10/100/1000 BASE-T Ethernet (ETH1/ETH2)	2 x RJ-45 10/100 BASE-T Ethernet (LAN1/LAN2)
	mini PCIe Slot (LTE, GPS Module)	1x Mini-PCIe (for LTE-cat4 / GPS(GNSS) Modem module)	-
	SIM Slot	1x micro SIM Slot	-
Alarm I/O	Antenna	2x 500 SMA Female for Main Antennas (OPTION) 1x 500 SMA Female for GPS(GNSS) Antenna (OPTION)	-
	Alarm Input	4CH, DI(0-30V Input), Pulled up to 5V via 10K0hm	4CH, DI(0-30V Input), Pulled up to 5V via 10K0hm
	Relay Output	4CH, Dry contact Relay(30V/DC/250VAC), NO/COM/NC (Terminal Block)	1CH, Dry contact Relay(30V/DC/250VAC), NO/COM/NC (Terminal Block)
ETC	Watchdog	Yes	Yes
	RTC	Yes	Yes
	Cooling Fan	-	-
	Factory Reset button	Yes	Yes
	LED Indicators	1 x PWR LED (3 Color) 1 x Status LED (3 Color) 1 x ALARM IN LED (3 Color) 1 x ALARM OUT (3 Color)	1 x PWR LED (3 Color) 1 x Status LED (3 Color)
Power	Power Supply	12V/3.3A adaptor DC +9V ~ +36V (DC Input Voltage)	12V/3.3A adaptor(TBD) DC +9 ~ +36V (DC Input Voltage)
	Power Consumption	16 Watts	6 Watts
Environment	Temperature/Humidity	-30°C ~ 70°C (-22°F~158°F) / 10 ~ 90% NC	-30°C ~ 70°C (-22°F~158°F) / 10 ~ 90% NC
Chassis	Dimension(WxDxH)	213.6 x 175.8 x 60 mm	94 x 153 x 28 mm
	Weight(Net/Gross,KG)	1.5/2.2	0.45/1.05
Mounting	-	Desk, Wall, VESA(200mmx100mm)	Desk, Wall, DIN Rail(OPT)
Certification	-	CE, UKCA, FCC, KC	CE, UKCA, FCC, KC

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