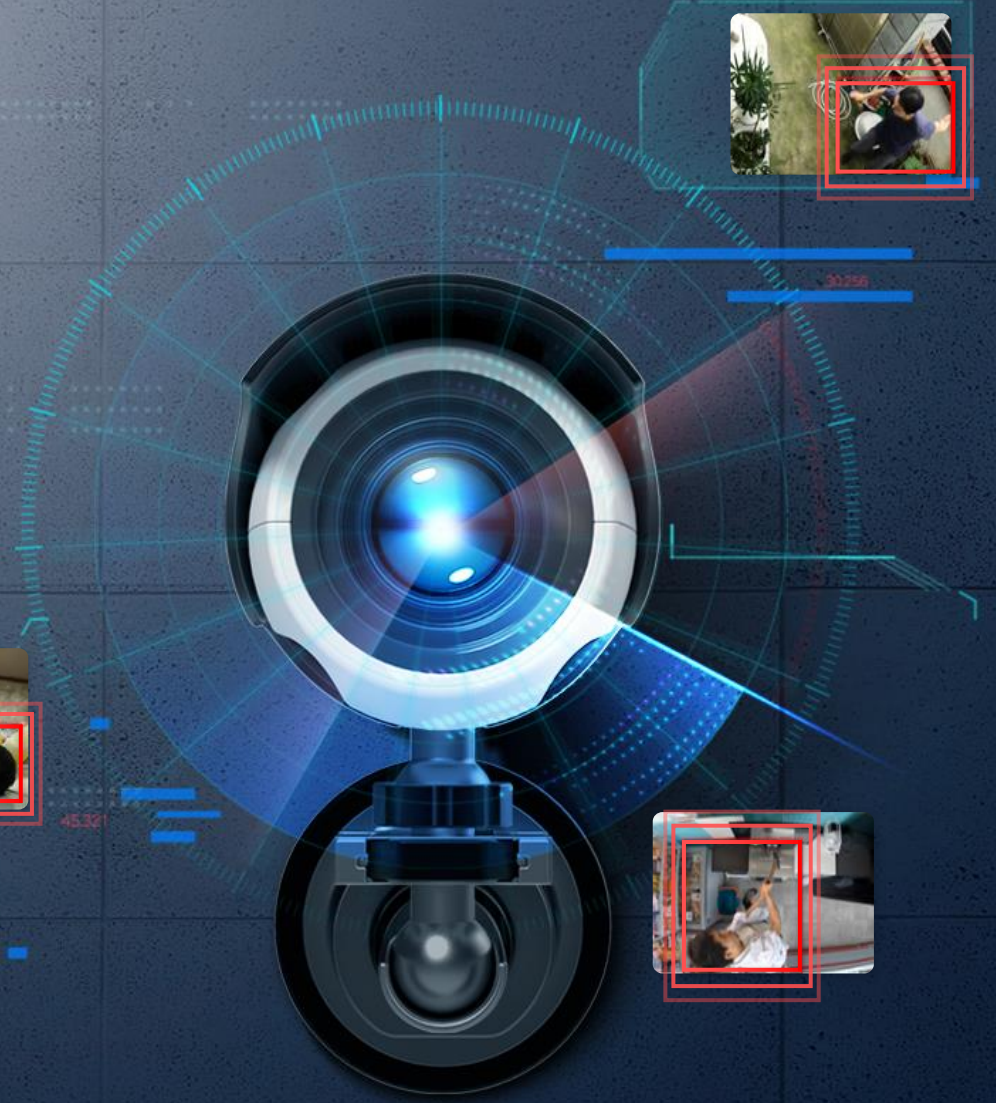
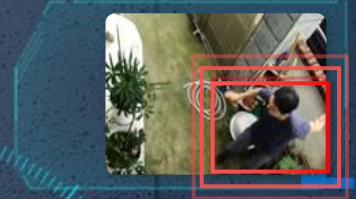
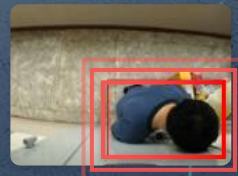


Certification System for Intelligent Surveillance Camera

May, 2023.



Tae-won Lee
(TWLEE@KISA.OR.KR)





CONTENTS

CHAPTER

01

Introduction



CHAPTER

02

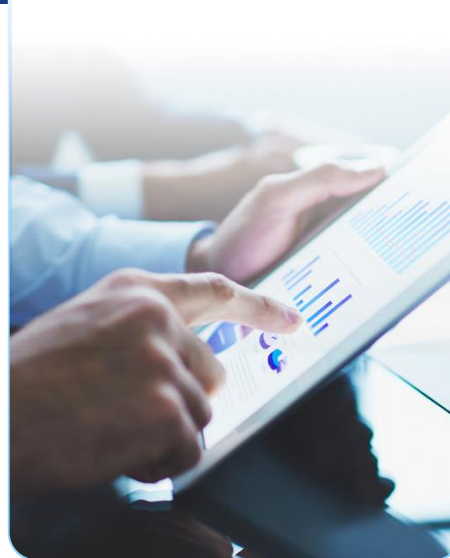
Status of Intelligent CCTV Operation



CHAPTER

03

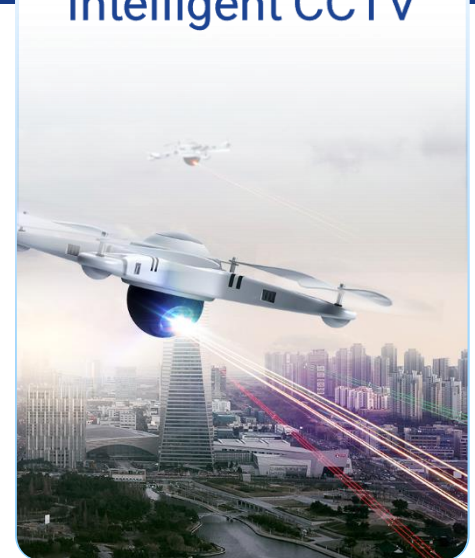
Issues



CHAPTER

04

Certification System of Intelligent CCTV



CHAPTER

01



Introduction

- 01 Definition of Intelligent CCTV
- 02 Flow of CCTV Control Center
- 03 Social Problem Solving Cases by using Intelligent CCTV

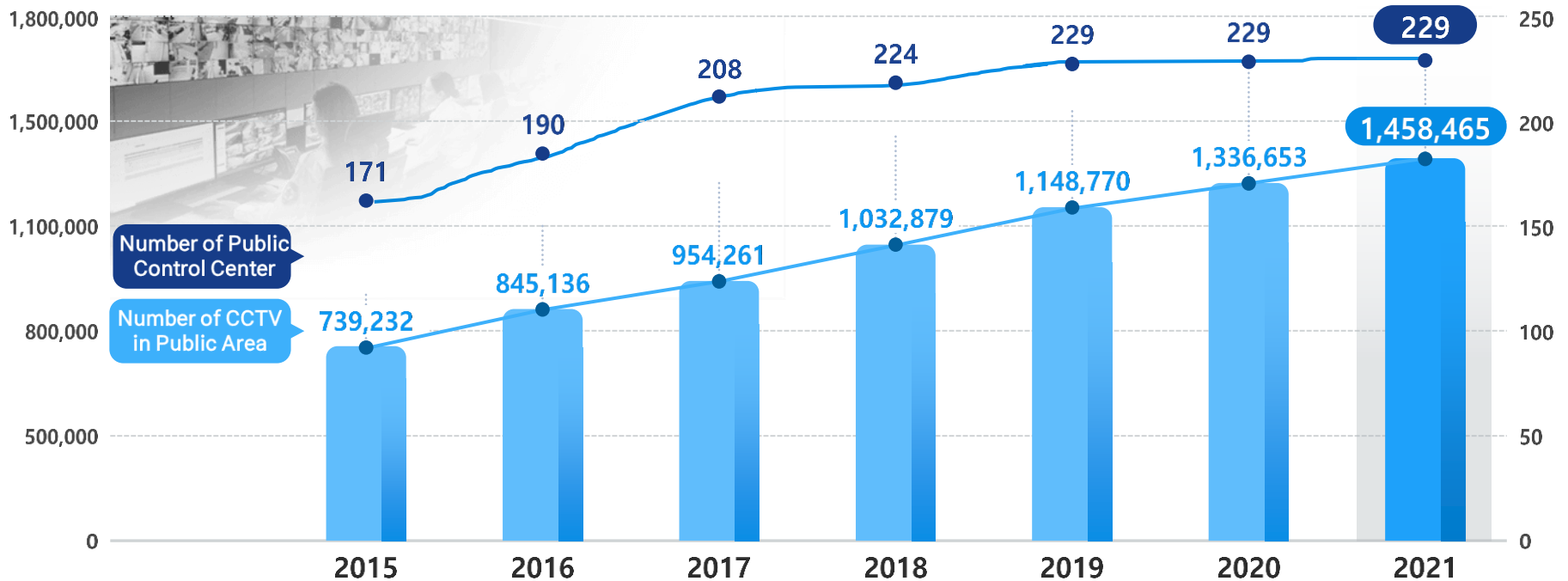
01 Definition of Intelligent CCTV

Definition CCTV (Closed-circuit Television)

- Surveillance system uses video camera
- Monitoring activities, behaviors, or event in an area

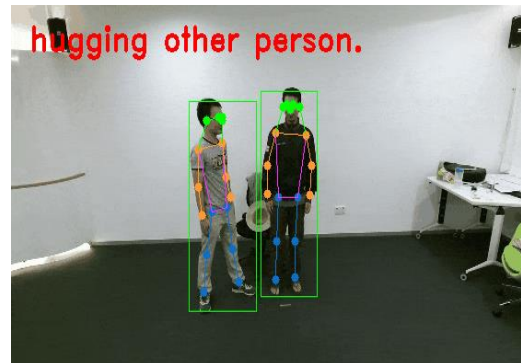
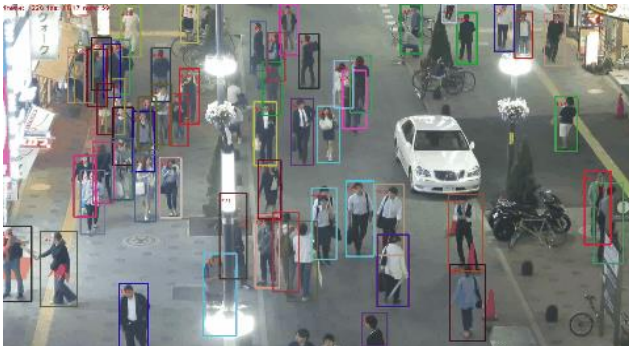


Status Ever-increasing usage of CCTVs beyond the limit



* Reference : Personal information Protection Commission (21.12.31)

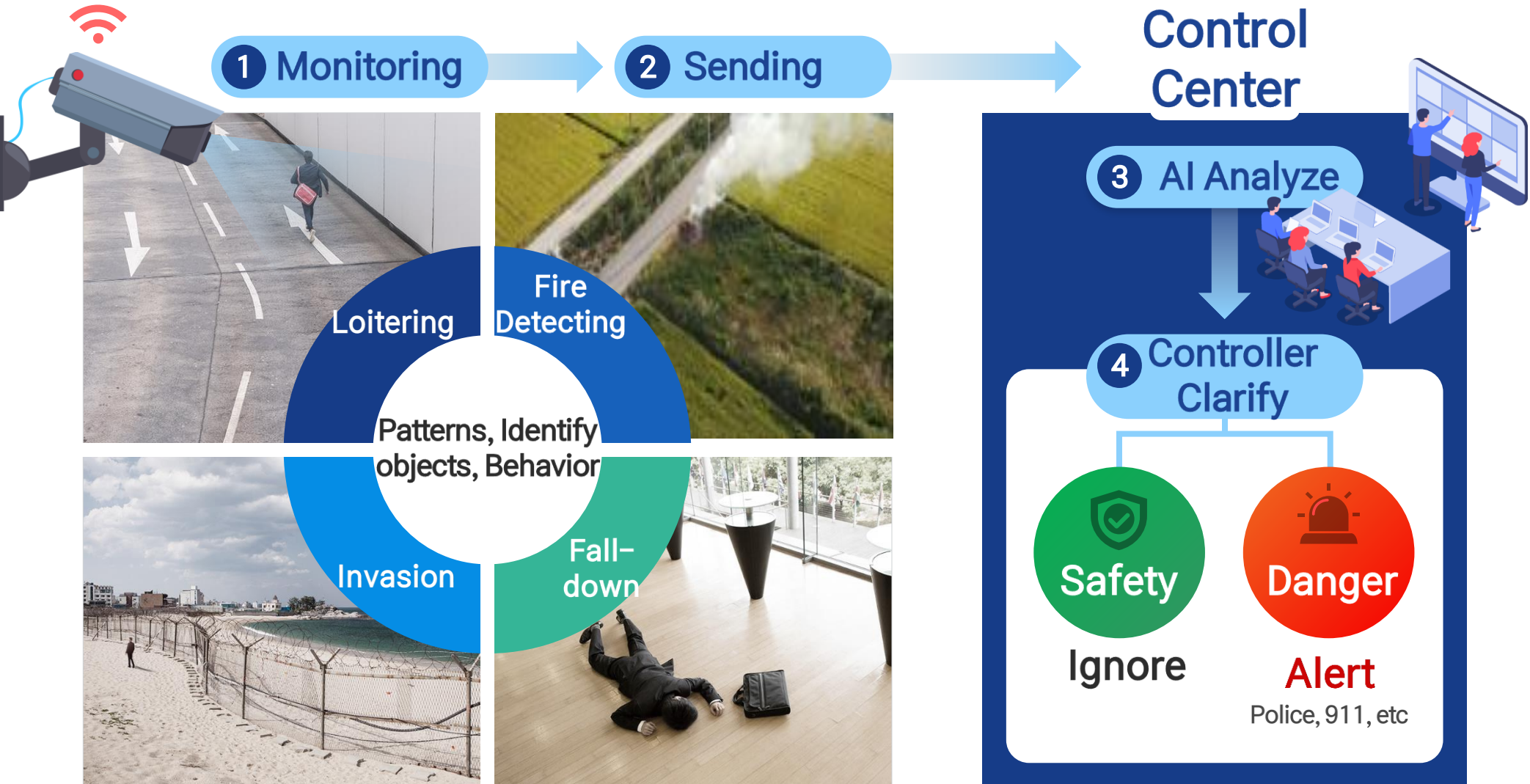
Detect event to analyze CCTV video with artificial intelligent SW



Fire Detecting, Car Counting, Hugging, Identify Person

01 Workflow of CCTV Control Center

1 Detect event to analyze CCTV video with AI SW



* 출처 : 서울신문

01 Social Problem Solving Cases by using Intelligent CCTV

아산시 방법 CCTV 확대 및 성능개선으로 시민 안전망 강화

방법·어린이·교통 등 CCTV 7000여대 365일 24시간 운영
차량털이 등 현장검거 697건, 사건사고 예방 4488건 등 시민안전 기여



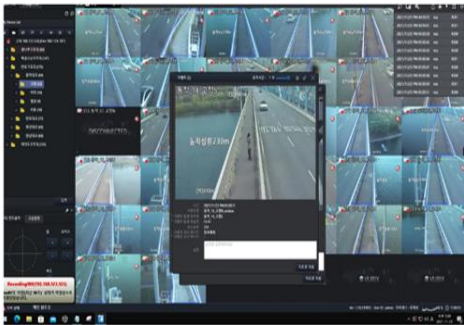
**광주 범죄·재난재해 꼼짝마...
CCTV 1123대 신설교체**



**인공지능으로 한강다리 투신 막는다...
AI CCTV 관제센터 구축**



AI가 CCTV 화면 보며 딥러닝 방식으로 이상행동 파악
4개 수난구조대 개발 CCTV 모니터링 시스템
통합 완료



◀ 인공지능이 한강다리를 배회하는 투신 시도자의 행동패턴을 찾은 모습



1. Jumping from bridges to commit suicide
2. Accidents detecting as car accidents, fire
3. Flooding detection and Response system

CHAPTER

02

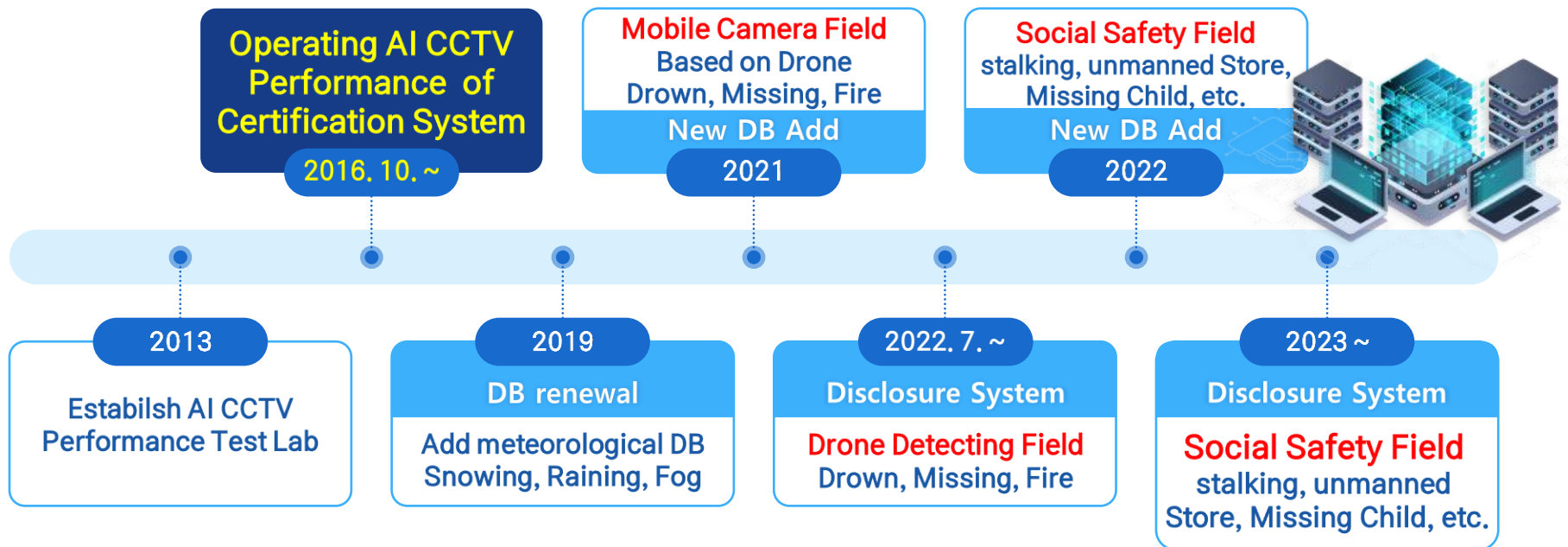


Introducing Certification System

- 01 Introduction to Certification System of Intelligent CCTV
- 02 Development of the National Life Sensitive Fields
- 03 Certification System Test Fields
- 04 Steps of Certification System Test

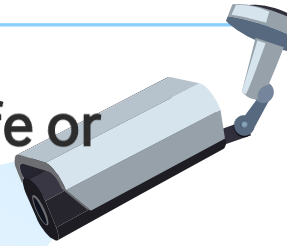
I Develop through a national R&D project ('13~)

- Relevant procedure and scope of technical requirements, DB for certification, Standard of detection meta-data in Intelligent CCTV



02 Development of the National Life Sensitive Fields

Developing a new certificate field area relate with saving people life or minimizing damage from disaster



Step 1

Step 2

Step 3

Step 4

Analyze

Disaster, Crime, Technology

- Join with customers for expanding Certification Fields and products

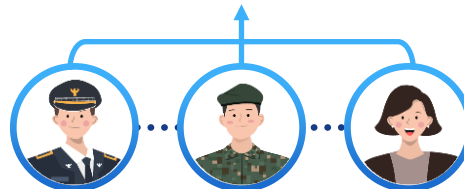


Develop

Simulation Scenario

- Make Scenario base on real accidents

Ex | A man try to throwing something to fence at 10 P.M



Police
Crime

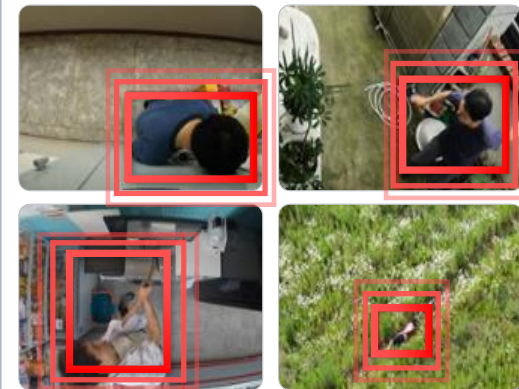
Army
Defence

Govern
ment
Public

Production

Video Production

- Over 200 hours videos on each fields for performance test



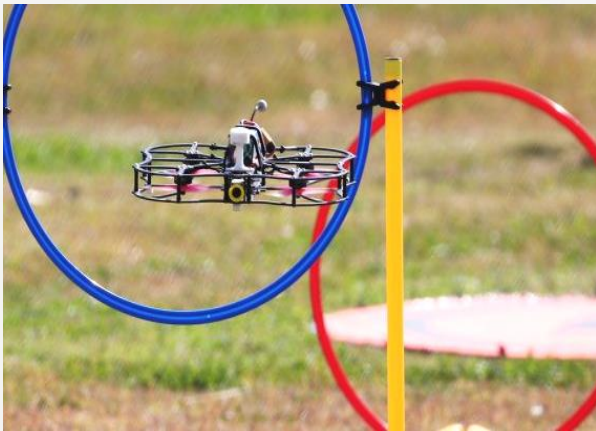
02 Step 1 - Analyze

Cooperate with relevant agencies for expanding Certification Fields and products

**“Finding Missing Person by using drone”
34 people found in 18 months**

파이낸셜뉴스 입력 2021.12.13 16:56 수정 2021.12.13 16:56

| 산악·하천 등 넓은 장소 탐색 유용



Jeonbuk Police 'looks for missing persons' using drones

송고시간 2021-12-15 16:25

| 3명 구성 드론수색팀 전북 곳곳 누벼
| 올해도 실종자 2명을 드론 띄워 발견



Fire Department "Speed up the development of drones and robots to suppress fires"

기사승인 2022. 02. 10. 15:31

| 소방발전 4.0시대 핵심 추진과제 발표
“초고령 사회 대응 서비스도 개편”



CCTV Spec, Operation place, Target Event, etc

Make Scenario Base on Real Case

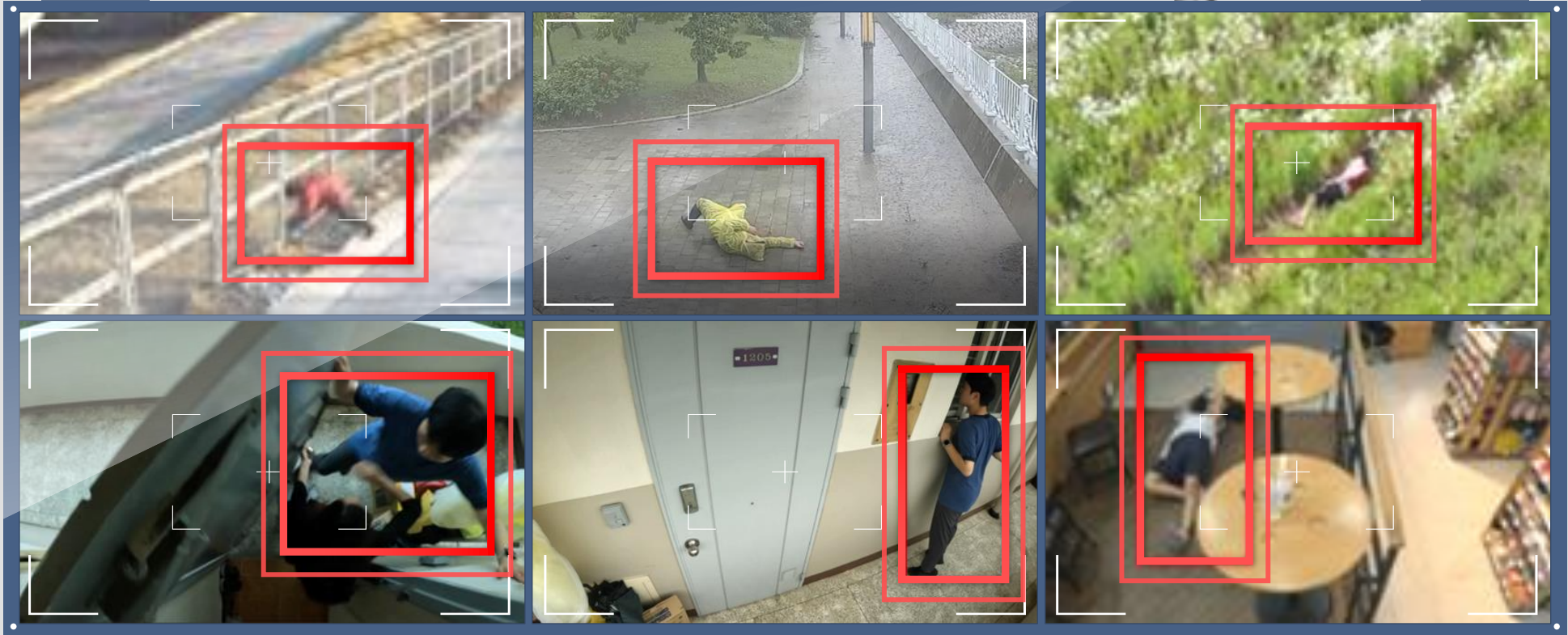
Event		Actor	Behavior		Place		Camera Engle						
노숙1	앉기	일진남/일진녀 건달남/건달녀	매장에 들어와서 둘러보다가	바닥에 앉아서 ~에 기대서 앉아 잔다	4 3	벽/진열대/냉장고	2	아이스크림 매장	편의점	4	좌측/우측/정면 전경/후면 전경	96	
	엎드리기	일진남/일진녀 건달남/건달녀	매장에 들어와서 둘러보다가	~위에 앉아서 엎드려 잔다	4 2	냉장고(혹은 테이블) - 1번째/2번째	2	아이스크림 매장	편의점	4	좌측/우측/정면 전경/후면 전경	64	
	눅기	일진남/일진녀 건달남/건달녀	매장에 들어와서 둘러보다가	~에 무릎, 허리, 팔, 머리 순으로 천천히 기대어 눕는다	4 2	바닥/냉장고 위 (혹은 테이블 위)	2	아이스크림 매장	편의점	4	좌측/우측/정면 전경/후면 전경	64	
노숙1	앉기	일진남/일진녀 건달남/건달녀	매장에 들어와서 주변 물건을 만지거나, 냉장고를 열고 닫는 행위를 한 뒤에	바닥에 앉아서 ~에 기대서 앉아 잔다	4 3	벽/진열대/냉장고	2	아이스크림 매장	편의점	4	좌측/우측/정면 전경/후면 전경	96	
	엎드리기	일진남/일진녀 건달남/건달녀	매장에 들어와서 주변 물건을 만지거나, 냉장고를 열고 닫는 행위를 한 뒤에	~위에 앉아서 엎드려 잔다	4 2	냉장고(혹은 테이블) - 1번째/2번째	2	아이스크림 매장	편의점	4	좌측/우측/정면 전경/후면 전경	64	
	눅기	일진남/일진녀 건달남/건달녀	매장에 들어와서 주변 물건을 만지거나, 냉장고를 열고 닫는 행위를 한 뒤에	~에 무릎, 허리, 팔, 머리 순으로 천천히 기대어 눕는다	4 2	바닥/냉장고 위 (혹은 테이블 위)	2	아이스크림 매장	편의점	4	좌측/우측/정면 전경/후면 전경	64	
쓰러짐1	기댐	백수남/백조녀 취객남/취객녀	매장에 들어와서 둘러보다가 어지러운 듯 잠시 멈추더니	그대로 옆에 ~를 붙잡으며 기대어 주저앉는다	4 2	진열대/냉장고	2	아이스크림 매장	편의점	보호장비	4	좌측/우측/정면 전경/후면 전경	64
	엎드리기	백수남/백조녀 취객남/취객녀	매장에 들어와서 둘러보다가 어지러운 듯 잠시 멈추더니	그대로 ~에 엎드리며 주저앉는다	4 2	진열대/냉장고	2	아이스크림 매장	편의점	보호장비	4	좌측/우측/정면 전경/후면 전경	64
	기절	백수남/백조녀 취객남/취객녀	매장에 들어와서 둘러보다가 어지러운 듯 잠시 멈추더니	바닥에 그대로 쓰러진다	4 2	바닥 - 왼쪽 라인/오른쪽 라인	2	아이스크림 매장	편의점	보호장비	4	좌측/우측/정면 전경/후면 전경	64
쓰러짐2	기댐	백수남/백조녀 취객남/취객녀	매장에 들어와서 둘러보다가 어지러운 듯 잠시 멈추더니	그대로 ~를 붙잡으며 기대어 주저앉는다	4 2	진열대/냉장고	2	아이스크림 매장	편의점	보호장비	4	좌측/우측/정면 전경/후면 전경	64
	엎드리기	백수남/백조녀 취객남/취객녀	매장에 들어와서 둘러보다가 어지러운 듯 잠시 멈추더니	그대로 ~에 엎드리며 주저앉는다	4 2	진열대/냉장고	2	아이스크림 매장	편의점	보호장비	4	좌측/우측/정면 전경/후면 전경	64
	기절	백수남/백조녀 취객남/취객녀	매장에 들어와서 둘러보다가 어지러운 듯 잠시 멈추더니	바닥에 그대로 쓰러진다	4 2	바닥 - 왼쪽 라인/오른쪽 라인	2	아이스크림 매장	편의점	보호장비	4	좌측/우측/정면 전경/후면 전경	64

sub total 832

Producer makes scenario base on accidents cases, news and survey

02 Step 3 – Production

Over 200 hours movies on each fields for performance test



Fixed Camera Fields (7)

Loitering	Intrusion	Abandonment	Fall-down	Violence	Fire Detection	People Counting
Stay over 10 sec in Specific Area	Enter the Specific Area	Illegal dumping	Human head hitting the ground	More than two people fighting	Human making fire	People cross the line

Standard

Over 90% Accuracy

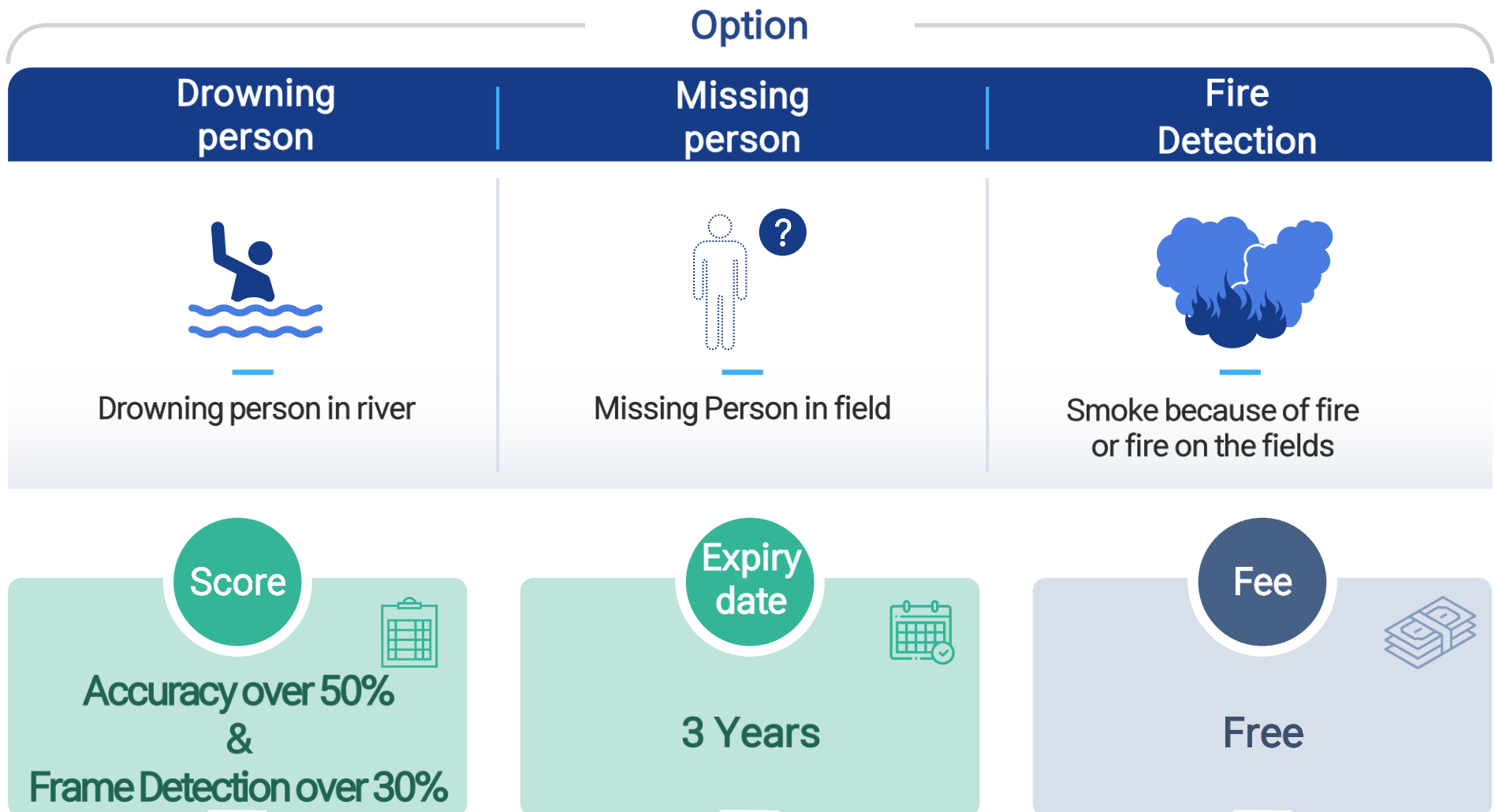
Expiry date

3 Years

Fee

Free

Mobile Camera Fields (3)



Loitering

People stay in specific area over 10 seconds



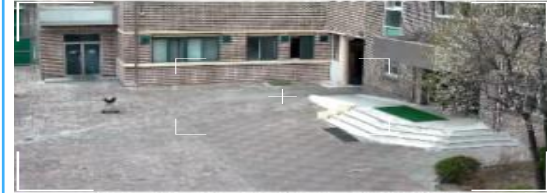
Invasion

Jump over an iron fence



Fire Detecting

Fire or smoking in the school



Fall-down

Suddenly person falls down on the ground



Abandonment

Dumping trash and bag



Fighting

Two people fighting



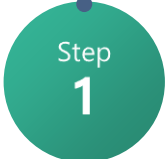
02 Steps of Certification System Test



Using Free data set

Visit KISA & Copy data in person (About 1,300 GB)

- Period: Immediately
- DB Size: 1,300GB
- Public: Public



Pre-Test

Using and Test only in Test Lab in KISA

- Period: 1 Week
- DB Size: 300 movies per Field
- Public: Non-Public



Test

Blind Test by KISA

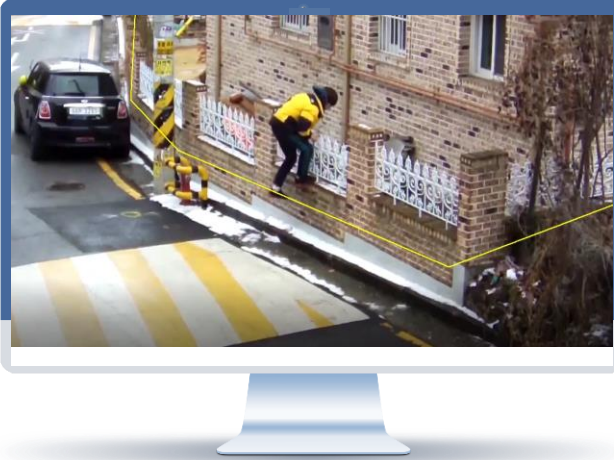
- Period: 2~3 Weeks
- DB Size: 300 movies per Field
- Public: Non-Public



02 Process for Performance Test



KISA

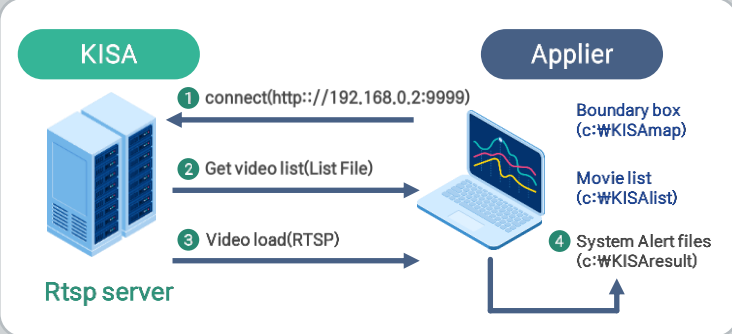
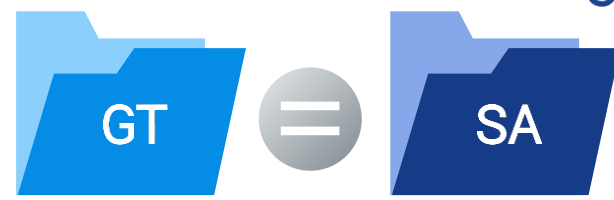


Applier



1
RTSP Streaming

3
Compare with GT (KISA) and SA (Applier)



formula
Score: F-1 score

Detail

$$\text{Detection Rate (r)} = \frac{\text{Detected}}{\text{Detected} + \text{undetected}}$$

$$\text{Precision (p)} = \frac{\text{Detected}}{\text{Detected} + \text{Misdetection}}$$

CHAPTER

03

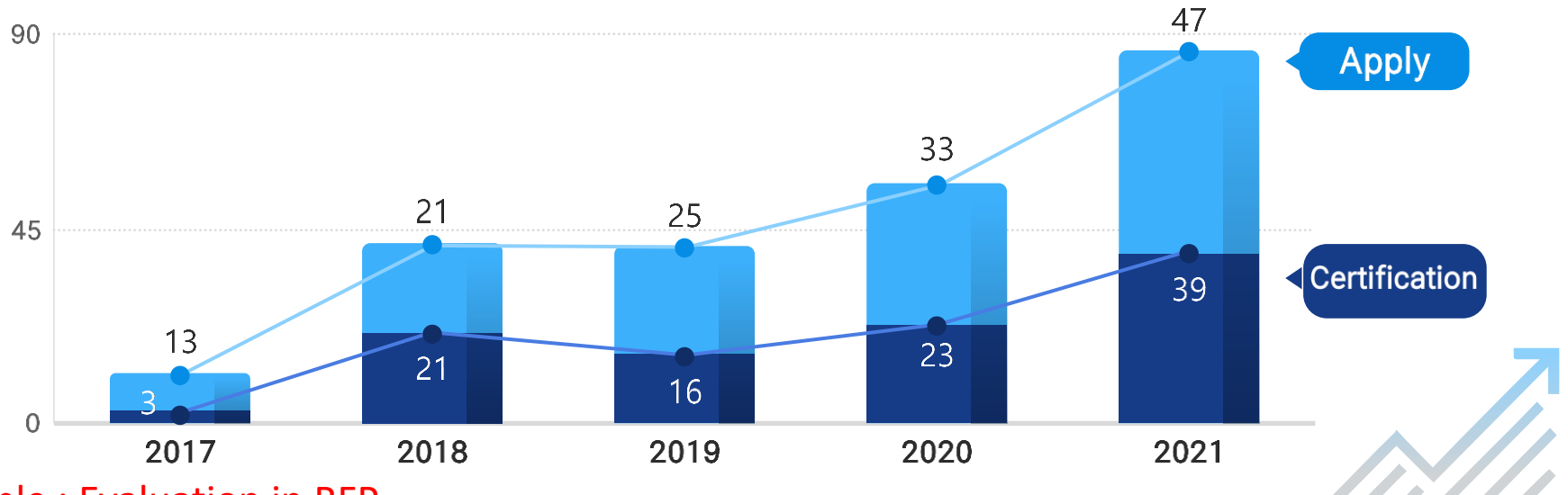


Plan to Expand Certificated Product and Fields

- 01 Certification Status
- 02 Implementation Plan for This Year
- 03 Best Practice
- 04 Preparing for Near Future Technology

03 Certification Status

Continuous increase of usage since launch of the Certification system



Sample : Evaluation in RFP

Technical Skill Score (3 points)

Field	Award	Criteria	Score	
Reliability	3 Points	Certificated Product by KISA	YES	2.0
			NO	1.4
		Limited condition for proposal	YES	1.0
			NO	0.7

Evaluation Criteria

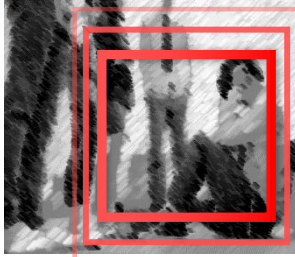
Field	Criteria	Award	note
	Sum	20	
Quantity Performance	Financial	Credit Grade Report	6
		KISA Performance Test Report	6
	Technical Skill	number of Technical Engineer	6
	Reliability	Limited condition for proposal	2

* 기술능력 보유평가 기준일은 입찰 마감일 유효한 인증서를 기준으로 한다.
 * 공동수급의 경우 업체별 개별평가 후 참가비율을 반영하여 배점

03 Implementation Plan for This Year

Safety in the school

- Accidents detection as fire, fall-down
- School violence as fighting, threatening



Ministry of Education



Seoul Metro



KOREAN NATIONAL POLICE AGENCY

Metro Accidents

- Safety accidents as falling, crowd crush
- Criminal detection as dumping, stealing



Stalking Development

- Dating violence as spying, fighting, Illegal home occupation



Cooperate Police with KISA to prevent stalking crime by Intelligent CCTV



<As-IS>
Increasing stalking crime and damage every year

"하루만 늦었으면 목숨이 위험할 뻔"...강력 사건 막은 대구 달서경찰

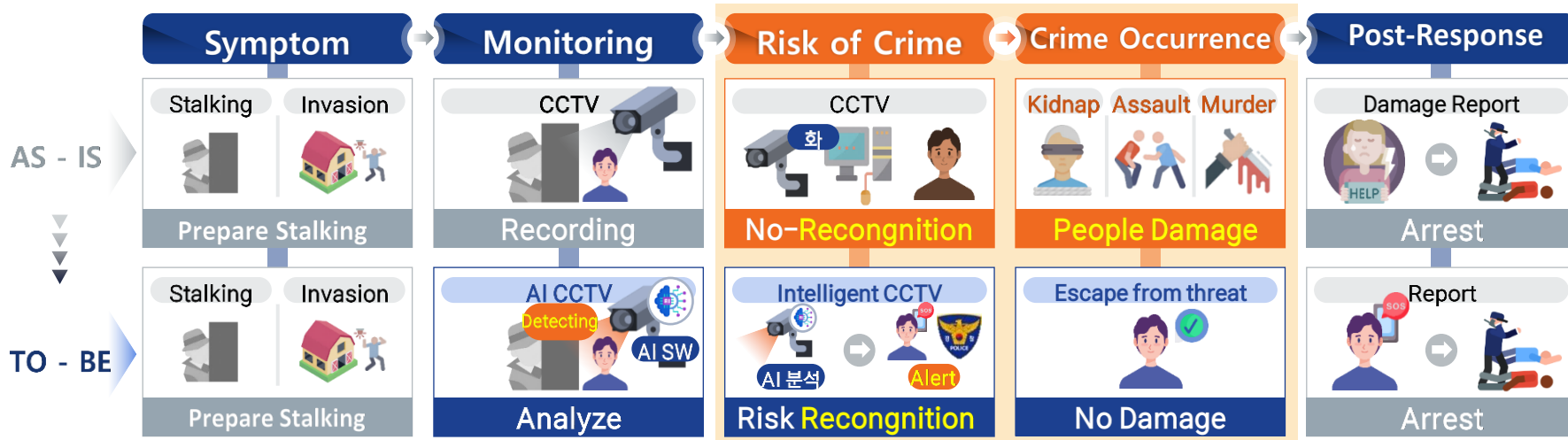
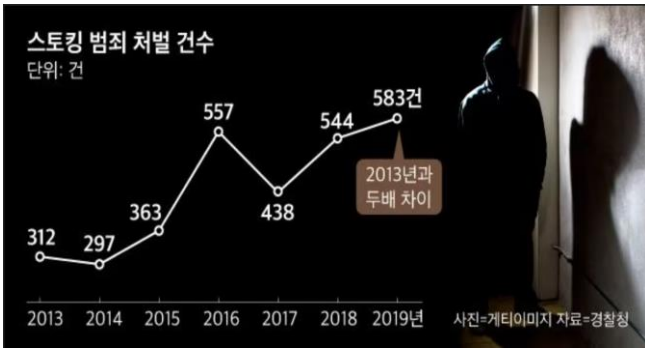
전국 | 2023-03-16 16:44 기사제보

피해자 보호 위한 CCTV 설치 적극 권유



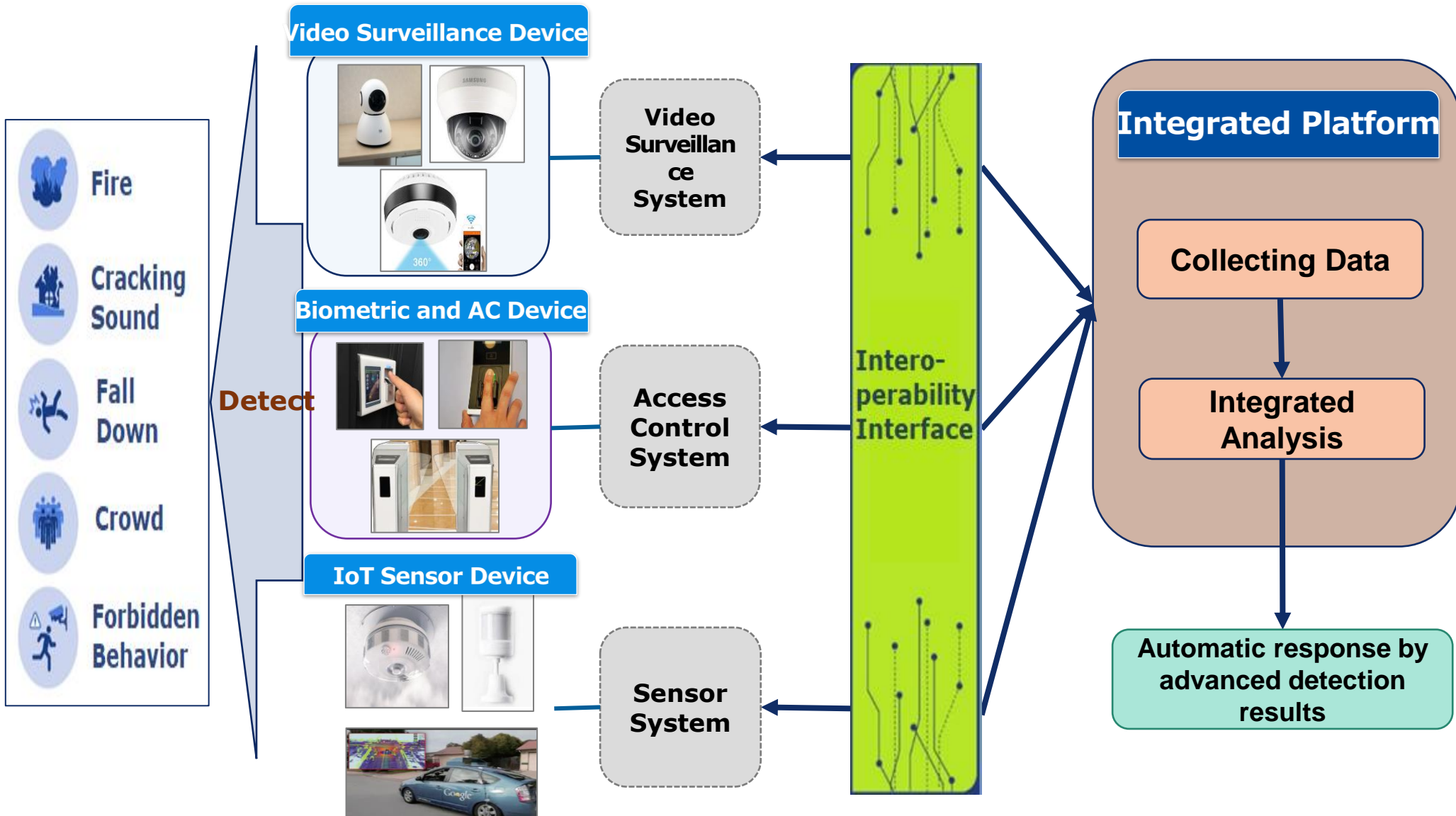
대구달서경찰서 전경 / 대구=김채은 기자

<To-BE>
Save the people's lives by Intelligent CCTV technology from stalking crime
Mar. 16, 2023



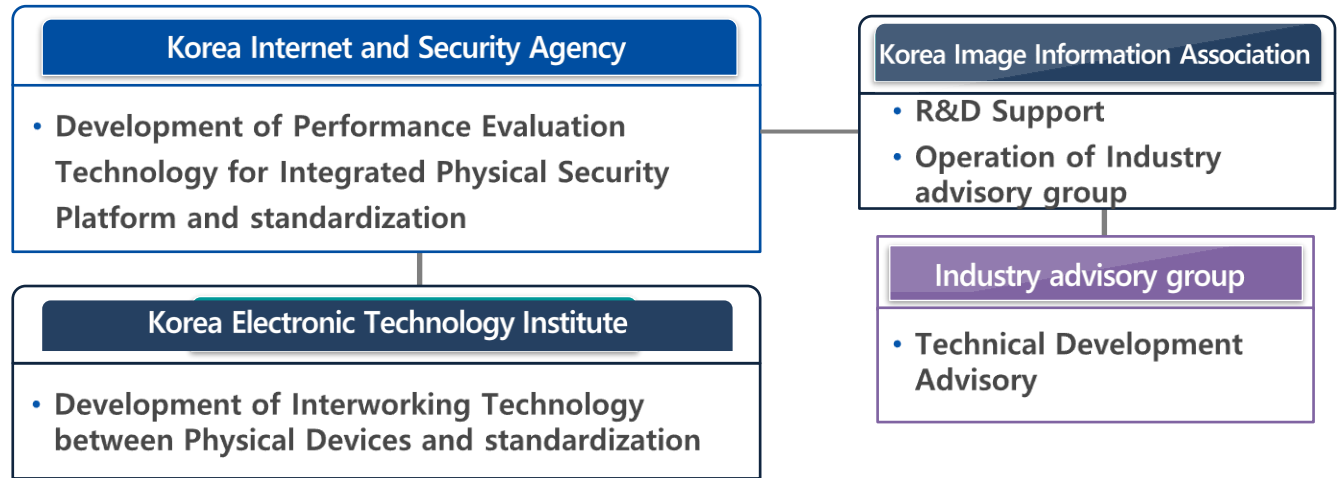
03 Preparing for Near Future Technology

Platform to eliminate the limitation by implementing Integrated Platform



03 Preparing for Near Future Technology

Development of operating system in Integrated Physical Security Platform based on Non-contact Service('22~'25)



Innodep Corp.

- SMART Industrial Park

Danusys Corp.

- SMART Village

EdgyDX Corp.

- SMART Construction Site

UnionCommunity Corp.

- SMART Building

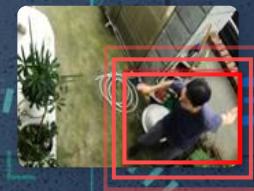
Suprema Corp.

- SMART Store

Thank You

KISA Tae-won Lee (twlee@kisa.or.kr)

03 of 13



MORE VIEW

