

SPHERE AX Company introduction

We live on SPHERE : AI Xperience



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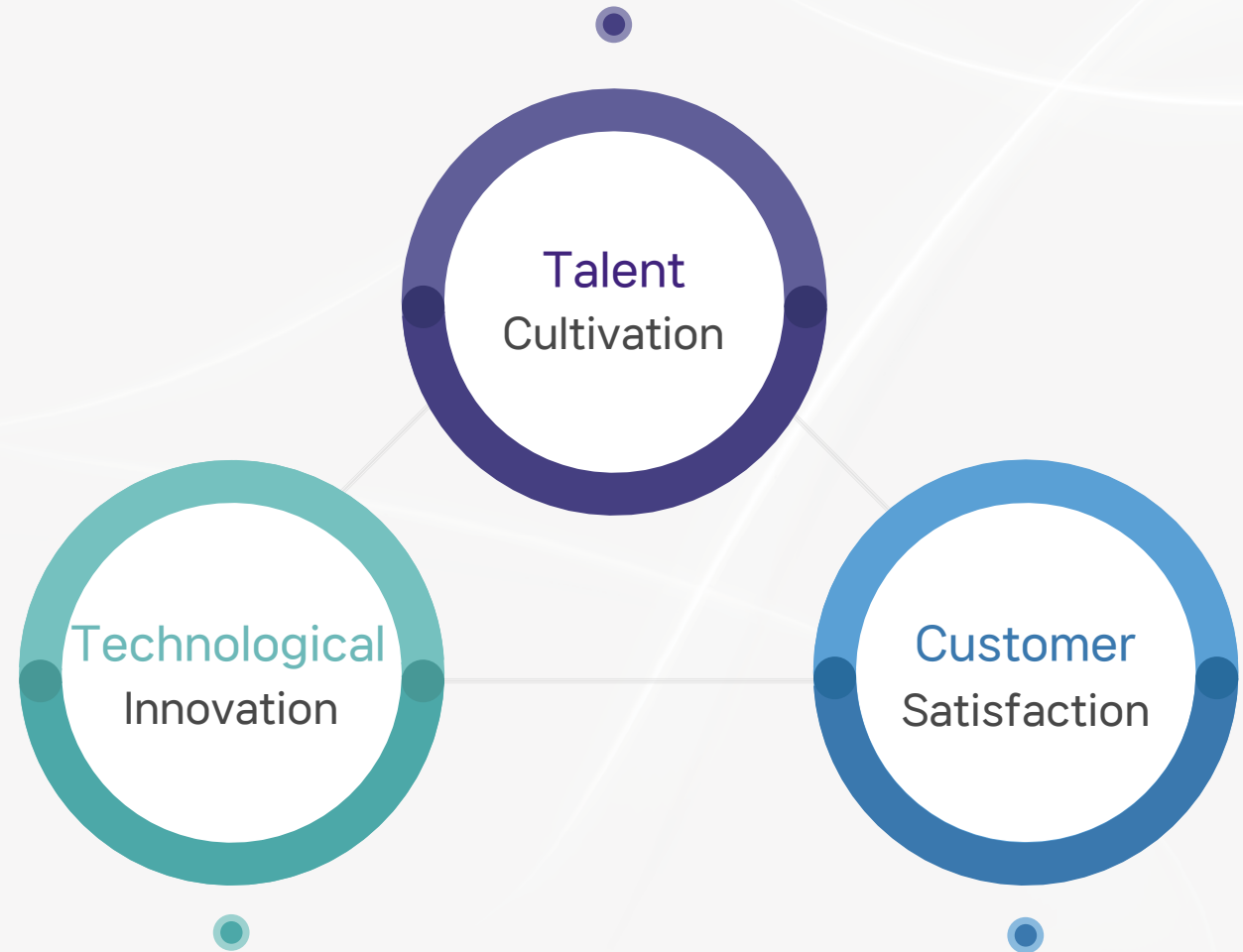
SPHERE AX

is leading the change as an AI+X platform company
by developing artificial intelligence(AI) video analysis technology
that is **essential in the world** through **constant research** with
talented employees.

SPHERE AX creates a safer and smarter future
by adding AI technology where society needs it.

SPHERE AX,

We live on **SPHERE** : AI Xperience



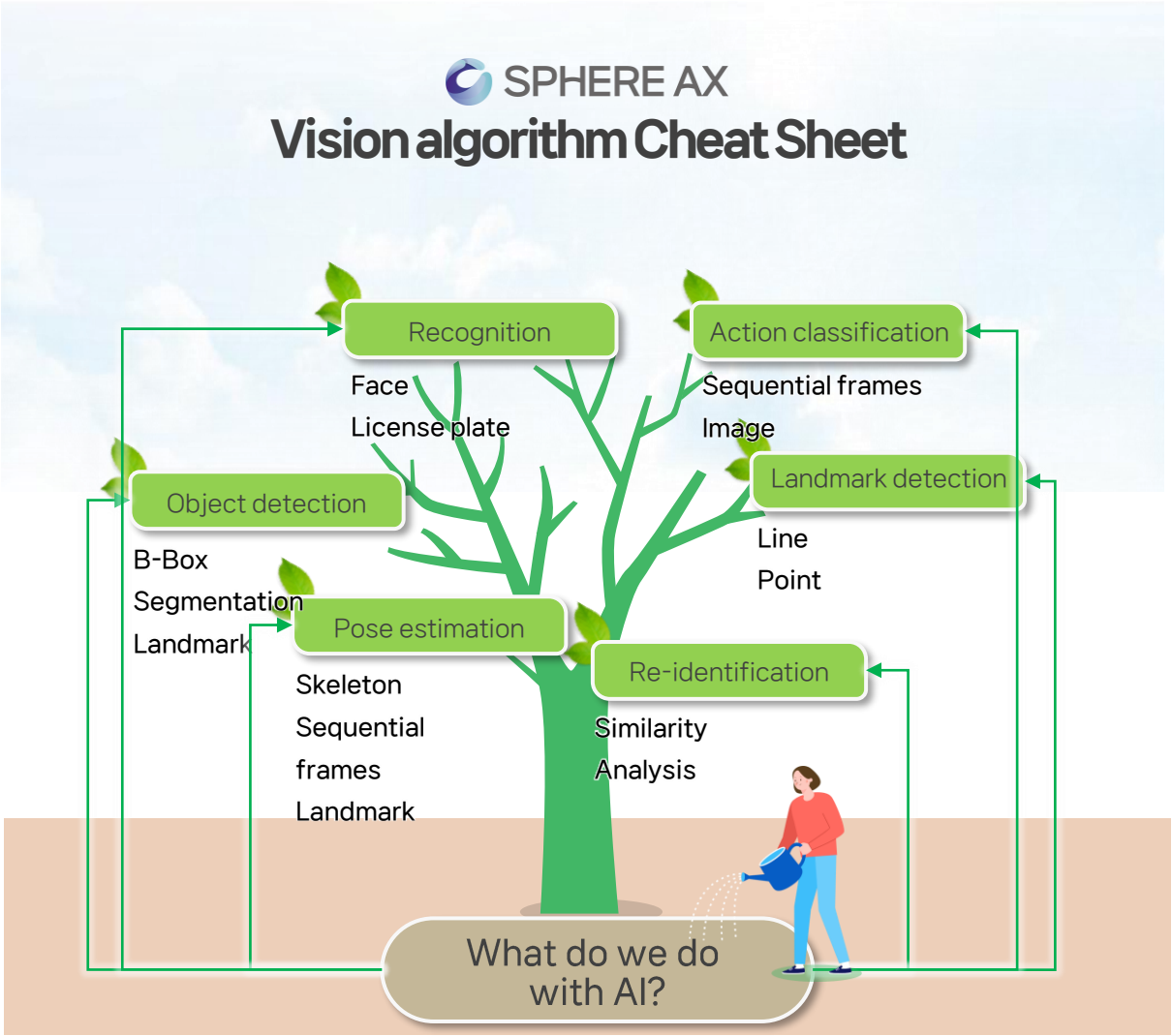
Our technology

Core Technology

Reference

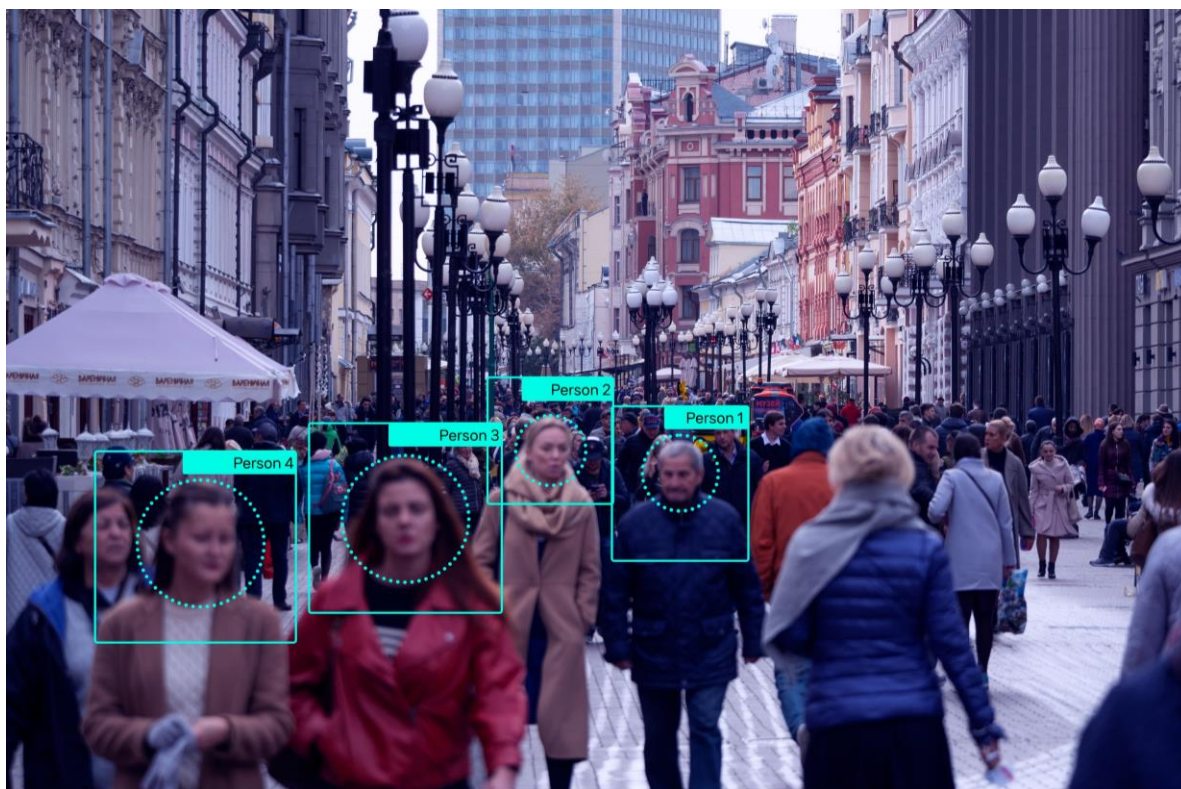
SPHERE AX's data-set

Object	Feature	Details
People	Object detection	People, Face, Gender, Color of clothes
	Re-identification	Similarity analysis in multi-channel
	Action classification	Fight, Fall (Human collapse), Wandering, Intrusion
	Pose estimation	Skeleton
Vehicle Vessel Airplane	Object Detection	Model, Color, Number Plate, Direction
	License Recognition	License Plate (Korea, Japan, Thailand, Europe...)
Animal	Object detection	Boar, Deer, Roe deer, Elk
	Action classification	Cow (Sitting, Walking , Lying down, Mounting)
Face	Face recognition	People and Face detection
	Face analysis	Emotion, Age, Gender
Forest Fire	Object detection	Smoke, Fire
Medical Video / Images	Object detection	X-ray type classification
	Segmentation	Bone classification
	Line detection	Bone angle



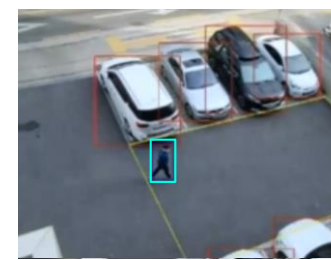
Real-time video analysis technology

Video analysis of related image information, real-time recording & alarm when a specific event occurs in multi-channel CCTV footage



Intrusion

Unauthorized object detection in a certain area



Loitering

Detecting objects that roam within a certain area



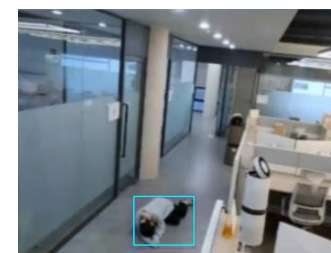
Line Cross

Calculate the number of objects passing through a specific line



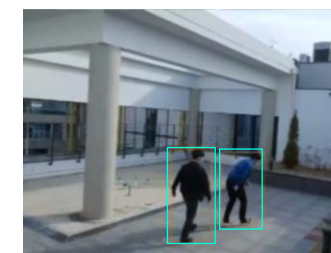
Crowd

Detect a group of objects within a certain area



Collapse

Detecting fallen and lying objects

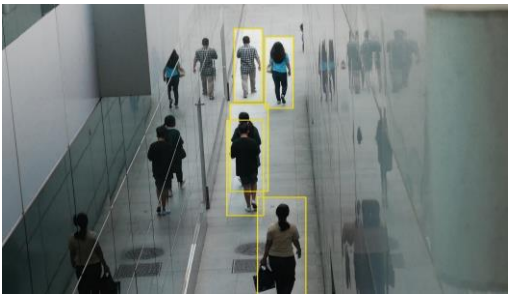


Fight

Detect objects who show violent behavior

Re-identification technology

Recognizes the same object in multi-channel CCTV footages and matches objects based on similarity evaluation



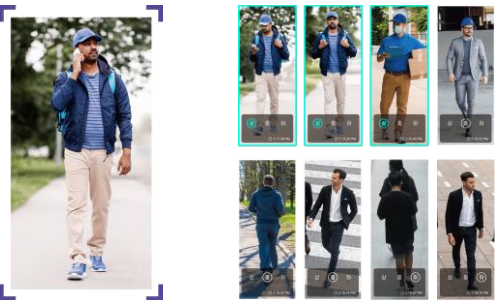
1 Object Detection and Object Tracking



2 Objects that found from CCTV footage



3 Comparing the similarity between the objects detected in CCTV footages and the object to be searched



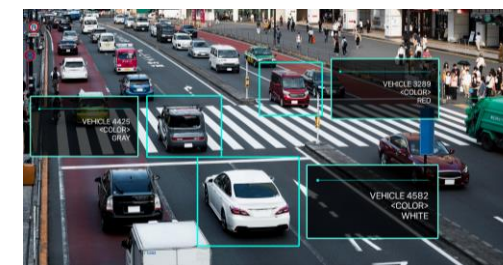
4 Shows 'search target objects' in order of similarity

High-speed video searching technology

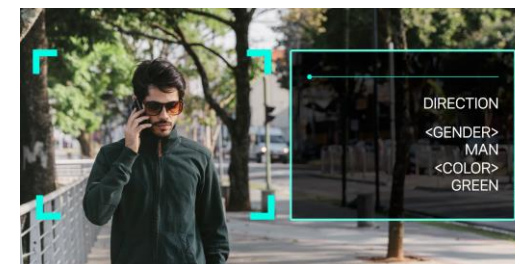
High-speed search and analysis of specific objects based on deep learning technology for multi-channel CCTV footages



- Provides up to 60x search speed based on high performance GPU
(up to 12 minutes based on 1 hour video & minimum search time of 4 minutes)



- Deep learning based object recognition and tracking



- Analyzes people, gender, clothes color, vehicle, manufacturer, color, moving direction etc.

Video security & personal information protection technology

Real-time object detection de-identification, copyright information management for high-definition, large-capacity video (based on domestic standard lightweight model)



Object Detection

Automatic detection of moving objects (people, vehicle)



De-identification

Provides de-identification (Masking function) for specified objects



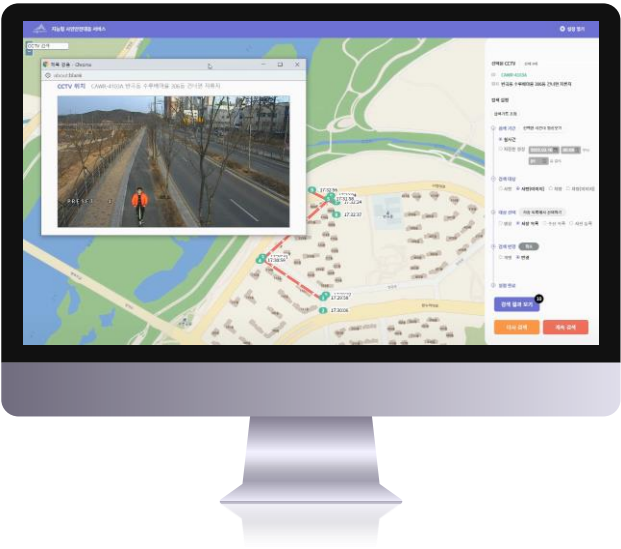
Watermark

Insert the copyright information of the video owner as a watermark

National Pilot Smart City - Sejong

Establishment of crime prevention and emergency response services for cities (parks, etc.)

Period	Detail
18.Dec.20 ~ 09.Jul.21	Object tracking and moving path construction service using deep learning based object re-identification technology




Object
re-identification


Object
Detection


Object
Tracking


High-speed
search

Development of a service platform based on child behavior analysis
to improve educational culture for children (Utilizing Edutech technology)

Period	Detail
01.Jan.22 ~ 31.Dec.22	Child emotion analysis service using facial expression and behavior analysis technology




Object
re-identification


Face
Recognition


Behavior
Recognition


Emotion
Analysis

Development of forest fire alarm system
capable of real-time detection based on AI and LBS

Period	Detail
01.Jun.22~02.Dec.22	Real-time forest fire & smoke detection and alarm function in multi-channel CCTV environment




Smoke
Detection

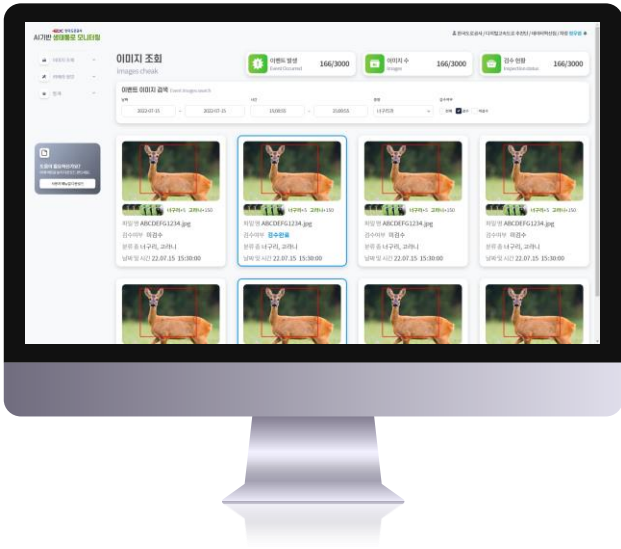

Forest fire
Detection


Multi-channel
video analysis


Forest fire location
estimation

Establishment of
AI-based ecological corridor monitoring system

Period	Detail
26.May.22~21.Dec.22	AI-video analysis based ecological corridor wildlife monitoring and data analysis service




Object
Detection


Object
Classification


Video
Analysis


Big data

Our product

VISCONPER 14

VISCONPER (Wild animal detection) 15

FIREWATCHER 16

CROWDWATCHER 17

SECUWATCHER 18

MOSAICER 19

AI Vision Analysis platform
'dara' 20

“A solution that uses deep learning based video analysis algorithm to detect and re-identify (Re-ID) people & vehicle objects in CCTV footages to track moving paths and search high-capacity CCTV images

Features

- 01 Multiple CCTV simultaneous analysis
- 02 Model by vehicle type, license plate analysis
- 03 Human object clothing color analysis
- 04 Track location with designated object recognition and re-recognition

Main Function



Multi-purpose CCTV video analysis



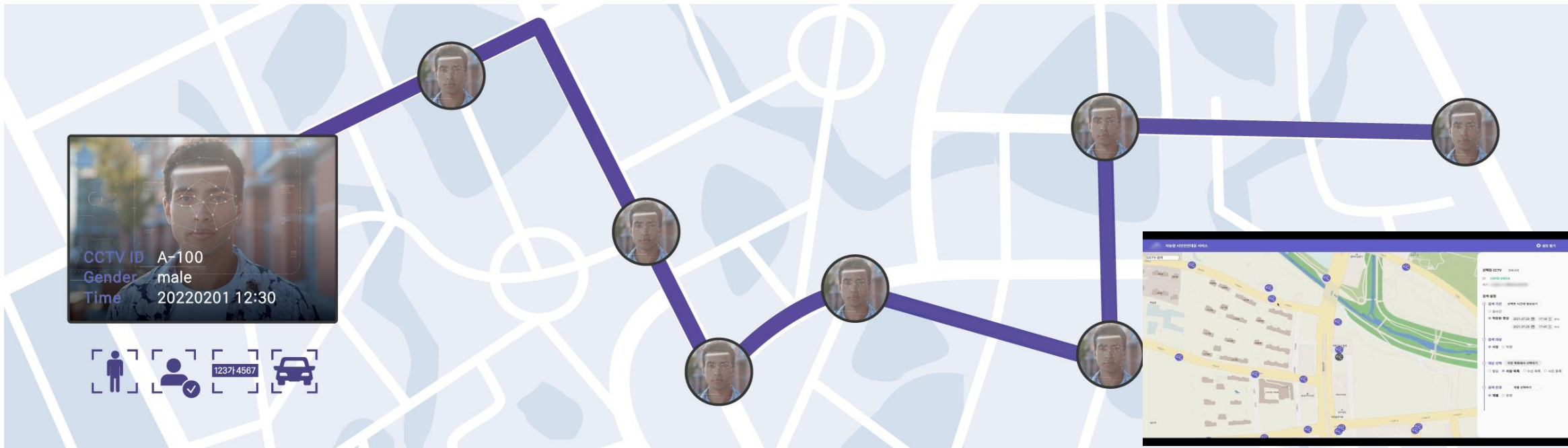
Possible to take prompt action for any events



AI based object identification and detection (people, vehicle etc.)



GIS based object re-identification and location tracking (face, number plate etc.)



“ A solution that can be used in areas such as ecological monitoring, wildlife protection and crop protection by applying deep learning video analysis technology to find wild animals in images taken by CCTV / trap cameras and analyze the appearance, frequency, and events of specific objects.

Main Function



Deep learning based wild animal detection and species analysis



Detect the distribution, density and event situation of a designated object



Automatic analysis and classification

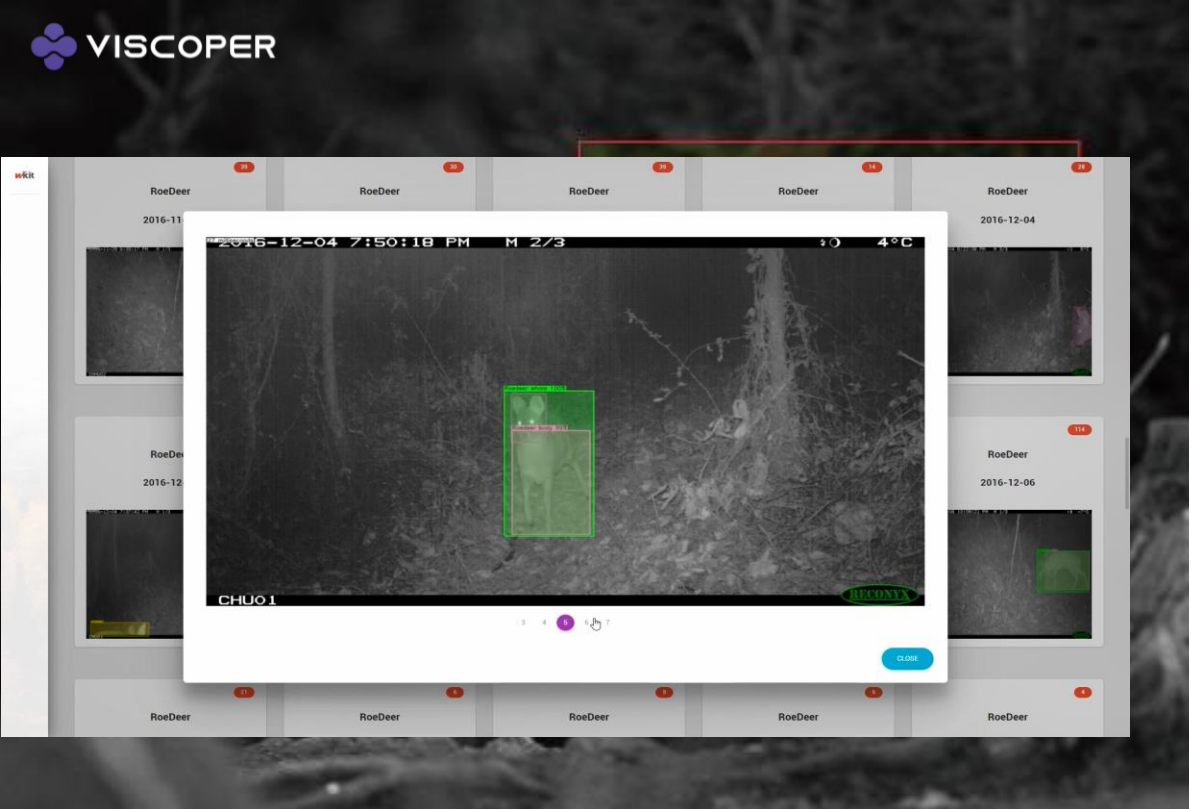
Features

- 01 People, Vehicle, Animal detection

03 Can be linked to existing operating platform (system)

05 High analysis accuracy rate
(Wild boar : 97%, other 11 species : above 85%)
- 02 Provide statistical data

04 Available to analyze and classified by wildlife object (12 species)
(boar, goat, elk, roe deer, badger, raccoon, cat, wildcat, marten, weasel, wild dog, person)



FIREWATCHER

Forest Fire Detection Solution

“ A state-of-the-art forest fire situation analysis solution for early response to fire extinguishing that detects smoke (not flame), in multi-channel CCTV footages by applying deep learning video analysis technology

Main Function



Multi-channel CCTV Video analysis



AI based object identification and recognition (smoke, cloud, vapor)



Real-time notification of event status



Prompt initial action in case of fire

Features

- 01

Detects the initial situation of a fire by detecting 'smoke' rather than 'fire'
- 02

A deep learning model that minimizes false detection of smoke-like clouds, fog, etc.
- 03

Enables simultaneous real-time multi-channel analysis and monitoring



“ A solution that analyzes the density of multiple people in the set area of CCTV footages based on deep learning video analysis technology and detects dangerous situations to enable rapid response

Main Function

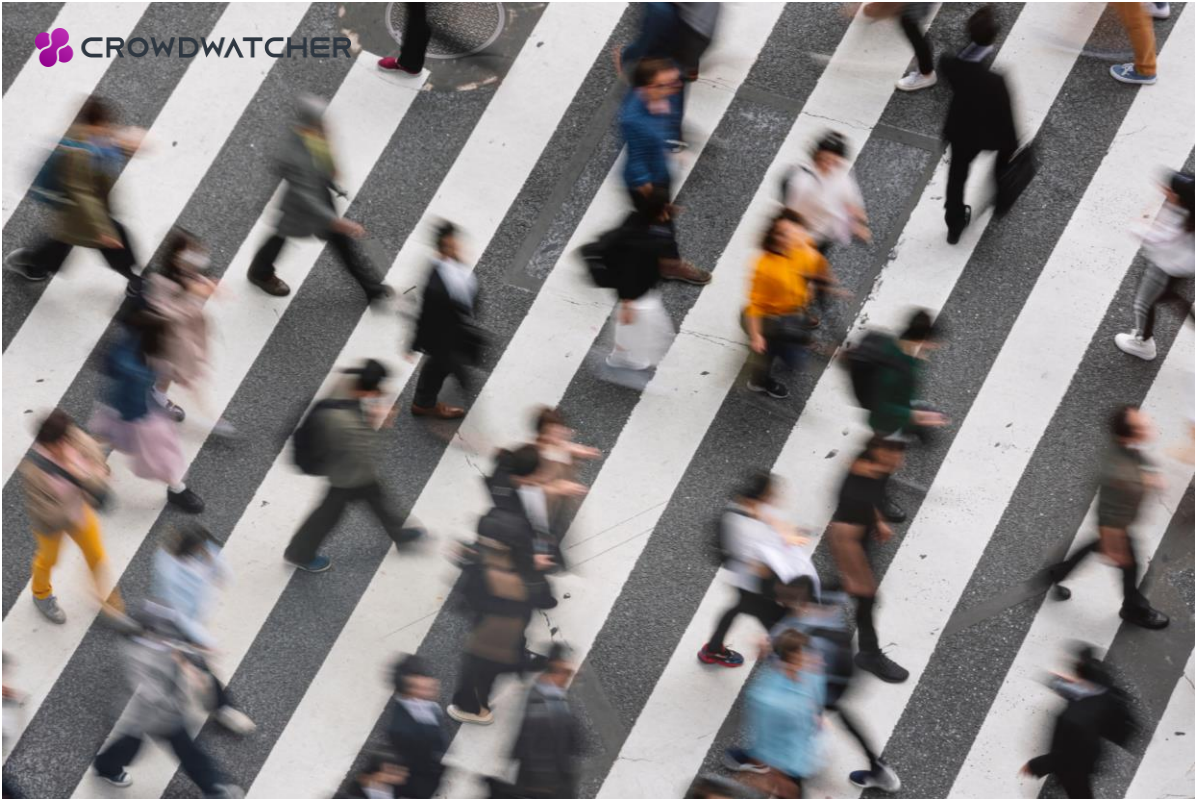
 CCTV video control in real-time	 Setting criteria for counting and clustering events & alarming when events occur	 Search, view, save, de-identify events (Searchable by date, CCTV, event)	 Manage CCTV lists and provide event statistics
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Features

- 01 CCTV real-time video analysis (crowd counting, density, identity, mobility-based risk)

03 AI Edge device can be connected to pre-installed CCTV to analyze
- 02 Performs 100% deep learning of core technologies (unit space identification, crowd coefficient measurement, movement direction prediction)

04 Support for rapid alarm and response to dangerous situations (Disaster response center, Related ministries, On-site speakers, etc.)





“ A video information security solution that can protect personal information by encrypting and storing video information captured at the CCTV control center through export management, forgery prevention and leakage detection

Main Function

 Personal privacy protection based on PDPA	 Video tampering prevention	 High speed encryption when saving recorded video (Lightweight encryption module)	 Provides information only under authority
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Feature

- | | |
|---|---|
| 01 Automatic and manual object tracking function (Human& Face Detection) | 02 Image, text watermarking technique (applying zero watermarking technique that is strong against video attacks) |
| 03 Differentiate video authority functions for the police and for civil petitioners | 04 Application of domestic standard lightweight encryption module (LEA-128) |
| 05 Video access control using only a dedicated player | 06 Systematic video transfer process through the management server |



- “ (1) Image de-identification web service provided based on AWS cloud to prevent exposure of personal information when images containing personal information are taken out.
- (2) A service that can easily and quickly apply masking on various file formats (video/images) to protect personal information.

How to use

1. Plan Selection

Create an account, check the total time of the video file and then select the service plan

2. Upload a video

Upload the video file by selecting the masking type for the video after payment.

3. Convert masking image

After checking the time required for export, service users can apply for video export with fixed amount of points

Features

- 01 Easy to use both online and mobile and do not require separate installation
- 02 Users can apply identification/de-identification of objects they want and adjust the degree of masking
- 03 Possible to detect/de-identify people, faces, vehicle and license plate with high accuracy
- 04 Users can freely choose the objects to be de-identified



“Dara is an AI video analysis platform that utilizes the GPU resource pool of cloud infrastructure.
By applying SPHERE AX's AI engine (ai dara), it analyzes objects such as people and cars in real time and provides various services.

Features



Various services provided in modular form

- LIVE CONTROL
- CLOUD NVR
- FACE ID
- Etc.



Cloud based service

- Reduce direct management elements
- Introducing and adding new equipment, simplifying storage expansion
- Supports both Cloud and On premise



Passed KISA intelligent CCTV performance certification
(Intrusion, Loitering, Collapse)



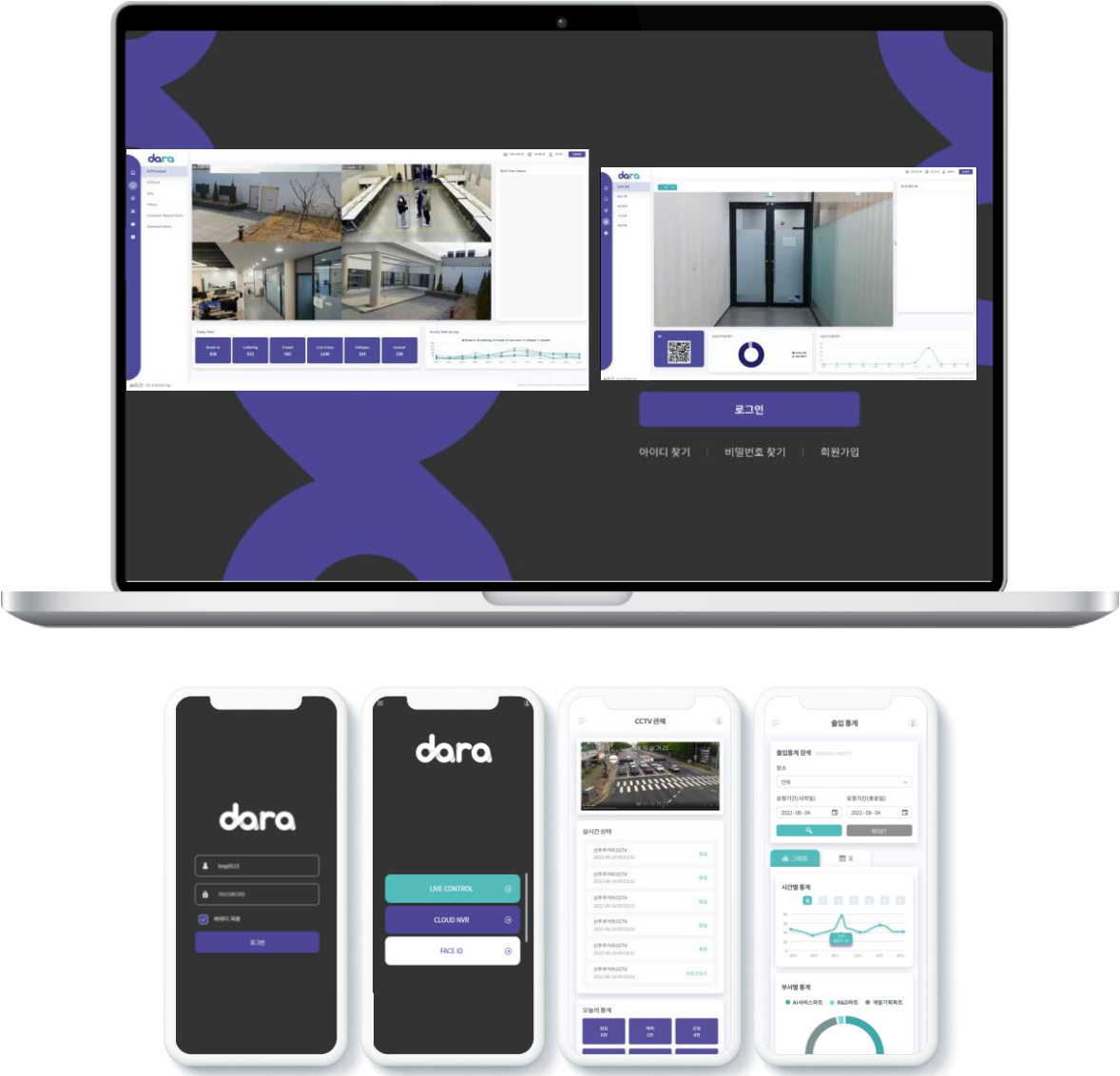
Web & Mobile support & UX optimized for each device



Efficient high-definition video storage using the latest compression standard technology



Provide video transfer service through personal video information protection platform



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Company

SPHERE AX Co., Ltd.

Date of Establishment

10th. December. 2008

Business Type

Software Development

Capital

11.5 billion (won, ₩) (as of Dec. 2022)

Employee

179 (as of March. 2023)

Product / Business

Artificial Intelligence (People·Vehicle·Wild animal detection AI,
Dangerous situation(forest fire, industrial accident) detection AI etc.)
Blockchain, Big-data,
Cloud based software development & supply

CEO Career

BA in Electronic Engineering, Yeongnam University
MS in Cyber Security, Gyeong-il University
CEO of WooKyoung Information Technology Co., Ltd.
President of Daegu · Gyeongbuk Venture Business Association
President of Daegu · Gyeongbuk ICT Industry Association
Director of the Federation of Korean Information Industries
(Former) 10th President of Daegu · Gyeongbuk KPC (Korea Productivity Center)
(Former) Director of Daegu · Gyeongbuk INNOBIZ Association
(Former) IT Mentoring Member of MKE (Ministry of Knowledge Economy)

CEO

Yun-ha Park





Establishment Stage (2008 – 2015)

Development of information security solution after establishment of SPHERE AX

- ('15) Commendation from the Minister of Trade, Industry and Energy
- ('15) Development of personal information protection system for dashcam
- ('14) Development of PUF ultra-light encryption video security system
- ('13) Establishment a company-affiliated research institute
- ('12) Registration of information and communication construction business
- ('08) Establishment of WKIT



Growth Stage (2016 - 2020)

Secure public confidence by launching intelligent video security solutions

- ('20) Exported 「Personal Information Protection Solution (Lite ver.)」 to Japan
- ('20) Participated in Korea National SmartCity Project (Sejong City)
- ('20) Completed construction of a new company building
- ('20) Signed a technical partnership agreement with C*** (Pakistan)
- ('19) Signed a sales contract with M*** (Malaysia)
- ('19) Registered the intelligent video solution as a procurement item (Expanded to the B2G market)
- ('18) Released video analysis solution
- ('17) Developed intelligent video security technology based on Deep Learning
- ('16) Released Secuwatcher for CCTV Enterprise video export (Personal Video Protection Solution)



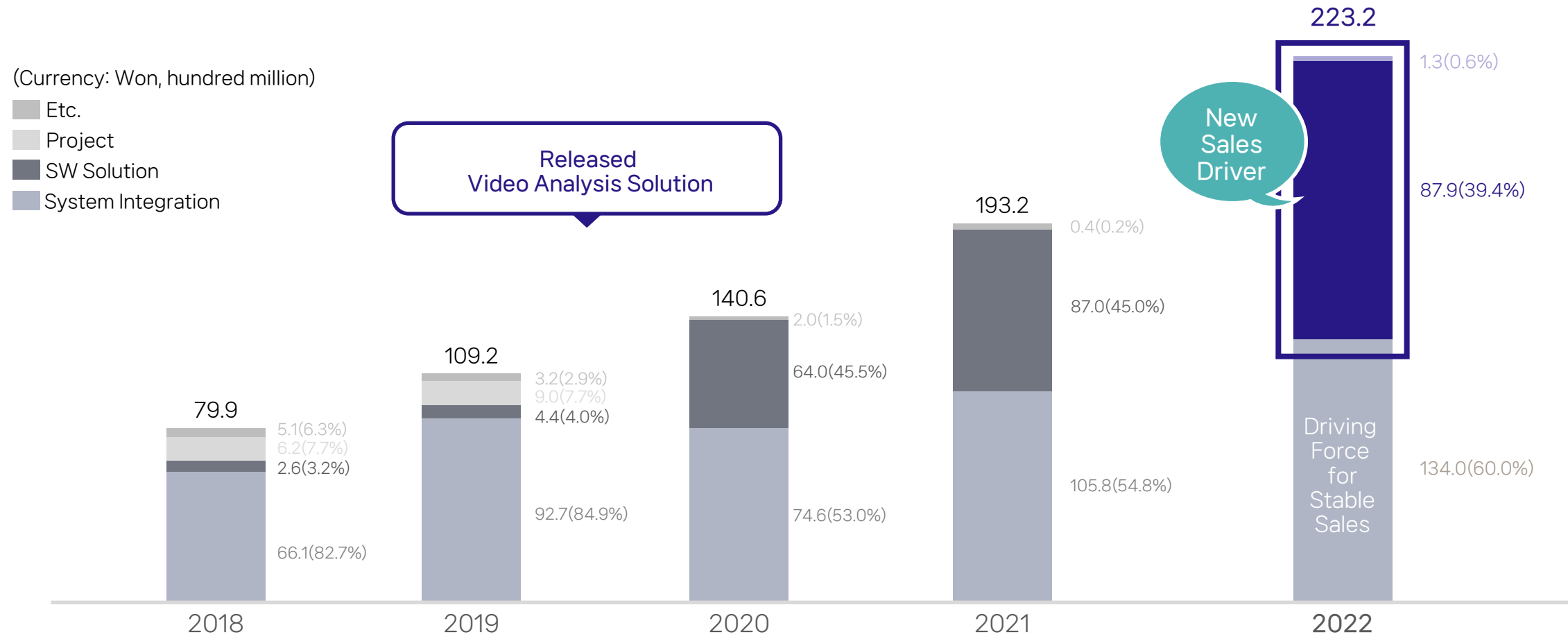
Take-off Stage (2021 – Present)

Promoting the expansion of intelligent video analysis based services by proving technology in the public market

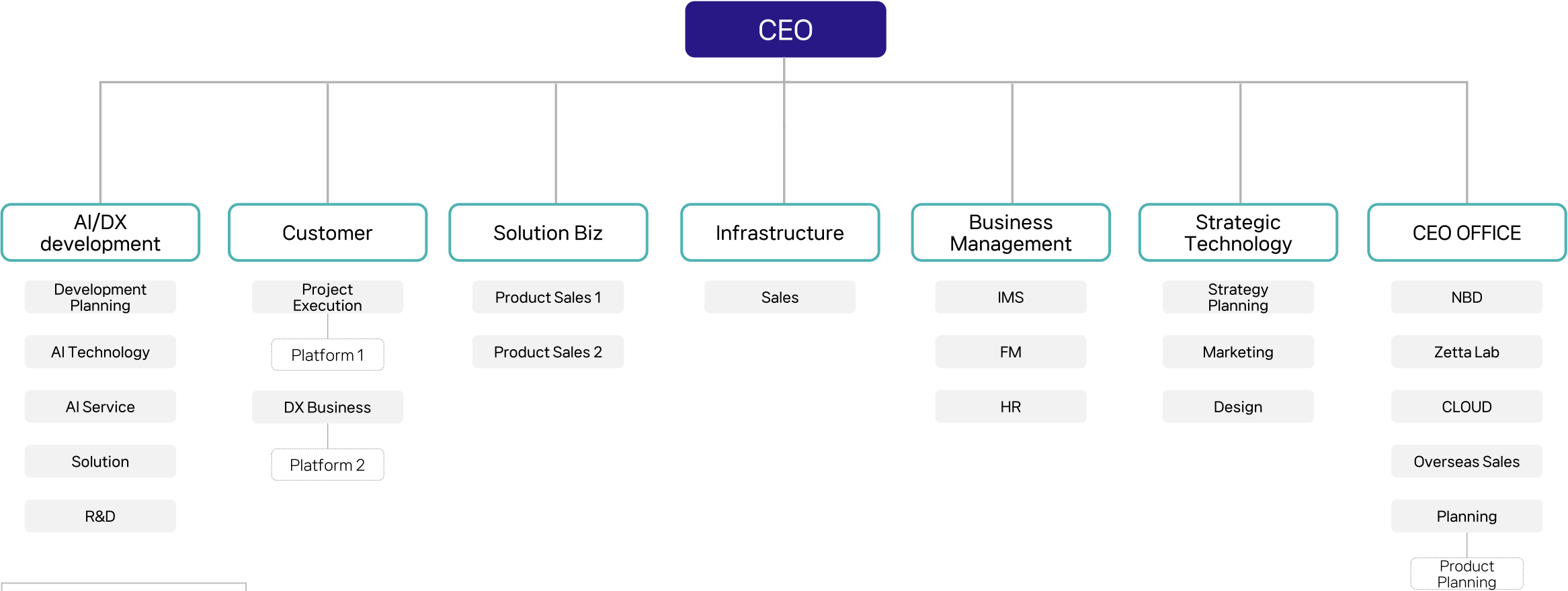
- (24) WKIT → SPHERE AX Company name Change
- ('22) Signed Kakao Cloud Service Partnership with Kakao Enterprise Co., Ltd.
- ('22) Signed Naver Cloud Platform service partnership with Naver Cloud Co., Ltd.
- ('22) Intelligent CCTV performance test certification (DARA v1.0) by Korea Internet & Security Agency (KISA)
- ('22) Launch 「MOSAICER」 in Japan
- ('22) Participated in Thailand Chachoengsao Smartcity Pilot Project
- ('22) Signed a MOU with D*** (Vietnam)
- ('21) Awarded 「WORLD CLASS PRODUCT OF KOREA 2021」 with Secuwatcher for CCTV
- ('21) Signed a sales contract with A*** (Thailand)
- ('21) Development of Vehicle Counting/ Aircraft ground operation/ Wild animal analysis technology

SPHERE AX has maintained stable sales through SI business

In 2020, SPHERE AX's SW sales grew about 15 times compared to previous year



Organizational Chart



Total manpower: 179
R&D manpower : 79 (44%)
(as of March. 2023)

IPRs (Intellectual Property Rights)



including
intellectual property patent registration and application

- > PCT Application 20 cases
- > Overseas Patent Application 7 cases
- > Trademark Registration/Application 18/3 cases
- > Design Registration 2 cases
- > Patent Registration/Application 23/19 cases



- 2018.06 **Communic Asia / Singapore** 2 times / ~2021.06
- 2019.10 **Japan IT Week Autumn / Japan** 5 times / Scheduled for 2023.10
- 2020.01 **CES (Consumer Electronics Show) / USA** 3 times / ~2023.01
- 2020.04 **Exported 「Personal Information Protection solution (Lite ver.)」 to Japan**
- 2021.11 **Awarded 「WORLD CLASS PRODUCT OF KOREA 2021」 with Secuwatcher for CCTV**
- 2022.02 **MWC (Mobile World Congress) / Spain** 2 times / ~2023.02
- 2022.04 **Participated in Thailand Chachoengsao Smartcity Pilot Project**
- 2022.05 **IFSEC International / England** 2 times / ~2019.06
- 2022.09 **IFA (Internationale Funkausstellung) / Germany**
- 2022.10 **Launch cloud based personal information protection web-masking service 「MOSAICER」 in Japan**
- 2022.11 **DigiTech ASEAN / Thailand** (Held a seminar for the Thai local governments) 2 times / Scheduled for 2023.11
- 2023.03 **Ho Chi Minh Smart School Project** in progress
- 2023.04 **SmartCity Asia / Vietnam** 2 times / ~2022.05



THAILAND



JAPAN



VIETNAM



MALAYSIA

Global
Competence



Marketing
Competence



Technical
Competence



Human
Competence

THANK YOU

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