



# For Better Safe World NAIZ CO., Inc

Company Introduction Ver 2.1



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# 01 Company Overview\_ Introduction and Major History

## Company Introduction ▶▶▶

<b>Company</b>	NAIZ Co., Inc	<b>CEO</b>	Ok, Jung Hun
<b>Establishment</b>	Jan 1 <sup>st</sup> , 2014	<b>Business Field</b>	Software Development and Delivery
<b>Address</b>	9th floor, 411, Teheran-ro, Gangnam-gu, Seoul, Republic of Korea		
<b>Contact</b>	TEL : 02-6052-9200~4 / FAX : 02-6052-9205		

## ◀◀ Main Business

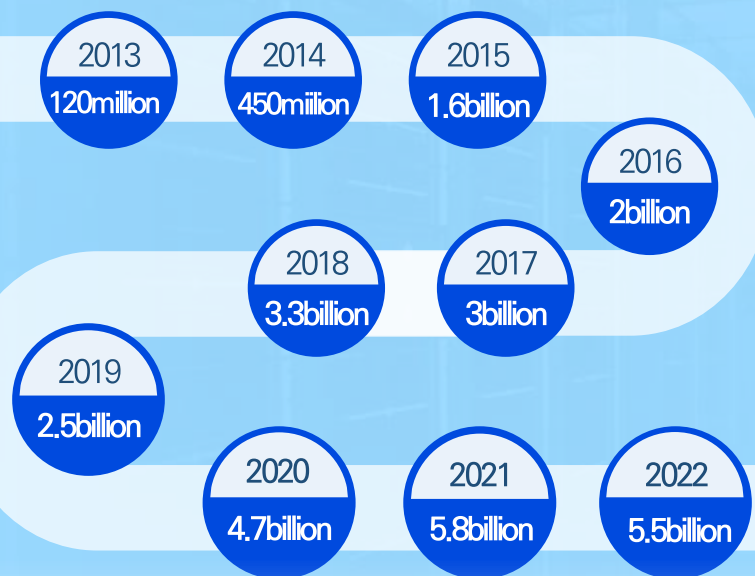
<b>Main Field of Business</b>	Integrated management of local governments
	Large enterprise factory and large-scale production facility
	CCTV control projects for military bases, power plants, apartments, and other facilities.
<b>Main Product</b>	Deep learning video analysis Smart Integrated Control System, CCTV Integrated control system(VMS), NVR

## History

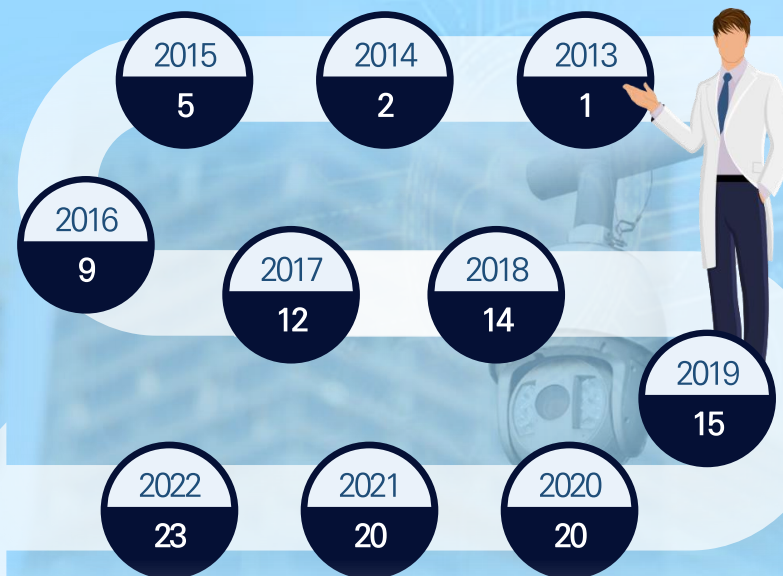
2013 ~ 2015	2016 ~ 2019	2020 ~ 2022
<ul style="list-style-type: none"> <li>Establishment of Individual Business</li> <li>Establishment of NAIZ Co., Inc.</li> <li>Acquisition of Program Registration [ Leopard storage distribution server, management server, client, map ]</li> </ul>	<ul style="list-style-type: none"> <li>KC Certification [ Leopard VMS, NVR ]</li> <li>Establishment of Affiliated Research Institute</li> <li>Venture Business Certification</li> <li>Office Expansion</li> </ul>	<ul style="list-style-type: none"> <li>Acquisition of Leopard Smart Integrated Control System TTA, GS Certificate of Technical Achievement T-3</li> <li>Office Expansion</li> <li>Acquisition of Leopard Smart Integrated Control System KISA</li> </ul>

# 01 Company Overview\_ Sales and Employment

## •• Sales by Year



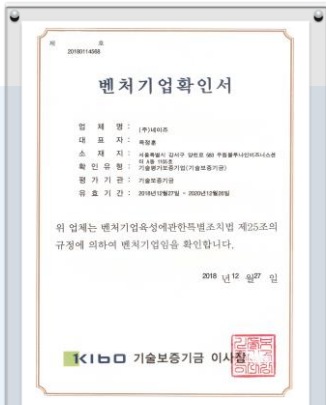
## •• Employment Status



# 01 Company Overview\_ Certification and Qualification



Research Institute



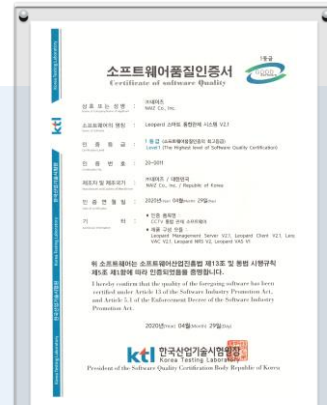
Certificate of Venture Business



KISA Certificate of Intelligence



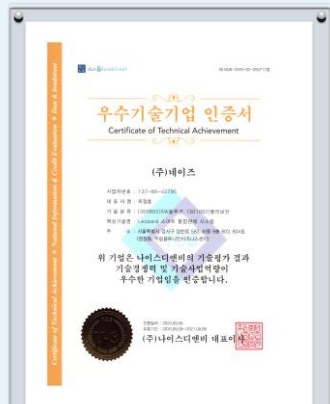
TTA Certificate of Security



GS Certificate  
\_1st Grade



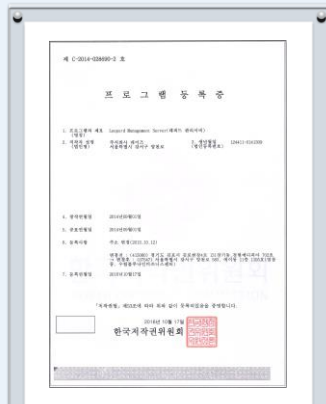
Copyright Certificate



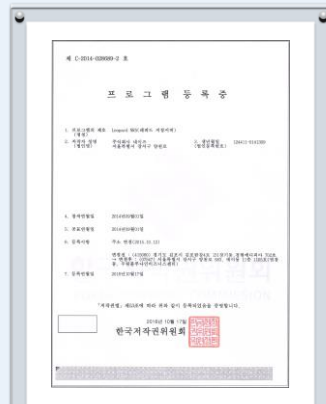
Certificate of Technical Achievement\_T3



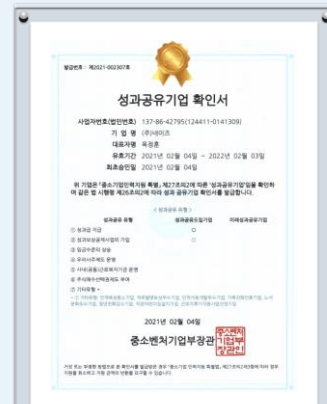
Korea Certification (KC)



Program Registration Certificate LMS



Program Registration Certificate NRS



Achievement Sharing Enterprise

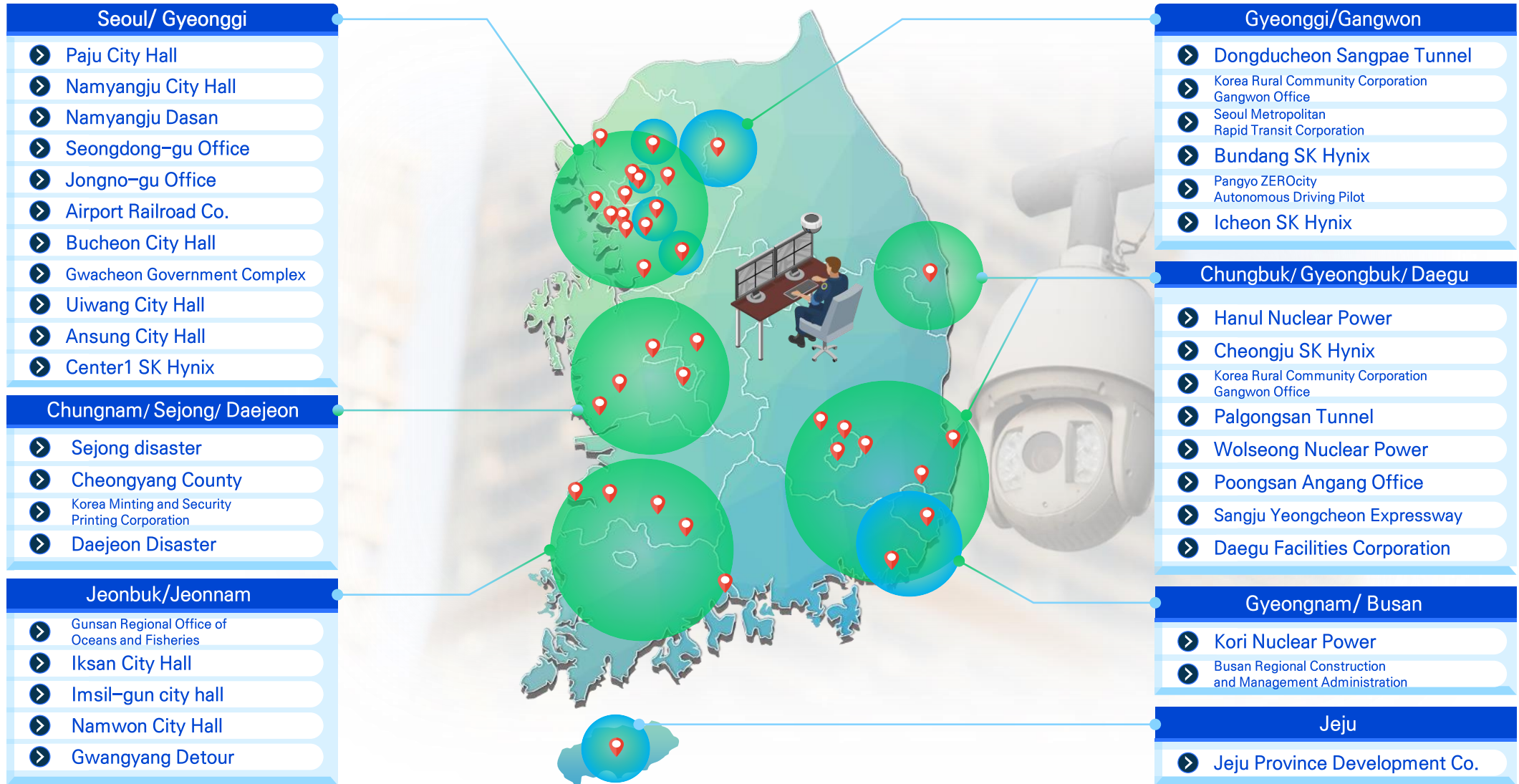


Youth-Friendly Company

# 01 Company Overview\_ Technology in Possession

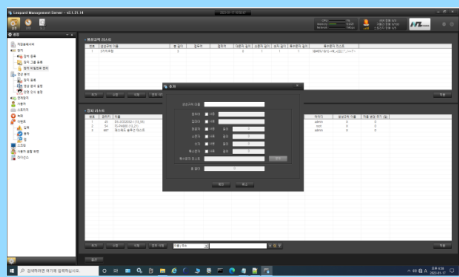
▶▶▶ Technology	Contents ◀◀◀
▶ KISA Certificate of Intelligence	Certification of performance for intelligent CCTV solutions : Loitering(98.3 points), Invasion(91 points), Fallen(99 points)
▶ GS Certificate_1st Grade	Integrated control program (VMS) and AI program for deep learning-based video analysis
▶ TTA Certificate of Security	Certification of security performance and quality for NVRs used in public institutions/ TCP-2013/ R04:2019
▶ Patent 10-1023207	[Apparatus and method for extracting video objects] Core technology for object detection and classification through video processing
▶ Certificate of Technical Achievement_T3	Classification of technology : (300802) SW Solution/ (301002) Physical security, Technical name : Leopard Smart Integrated Control System
▶ Program registration certificate /Copyright Certificate	Smart Control Integrated Program, NVR(Network Video Recorder) 16~100 Channel equipments full line-up
▶ CCTV Video Control Field	<ul style="list-style-type: none"> <li>☑ VMS(Video Management System), NVR(Network Video Recorder) : core software technologies and solutions for CCTV video control</li> <li>☑ VMS OS : based on Linux, no MS CAL license costs associated with it.</li> <li>☑ Unique capability to store, distribute, operate and manage up to 1,000 CCTV cameras with a single server.</li> </ul>
▶ Deep Learning Video Analysis	<ul style="list-style-type: none"> <li>☑ Object detection engine and technology based on deep learning technology</li> <li>☑ Solution for face restoration based on deep learning technology</li> <li>☑ KTC, a public certification agency, has issued a test report on the performance and accuracy (97%) of the system</li> <li>☑ One million video data for over 50 analysis classes and completed the learning process.</li> </ul>

# 01 Company Overview\_ Distribution Status

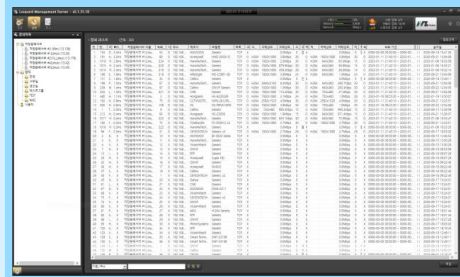


# 02 Leopard VMS\_ Key Features

## Management Server



- ✓ Periodically change the CCTV password Built-in solution that changes automatically  
[ Basic cost ₩ 18,000,000 + ₩ 60,000 per channel when introducing a dedicated solution ]



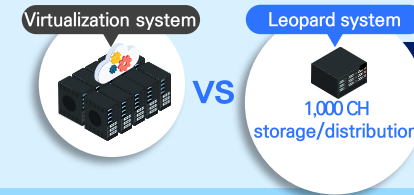
- ✓ Real-time status monitoring for efficient management of multiple CCTVs and servers

## Storage Distribution Server



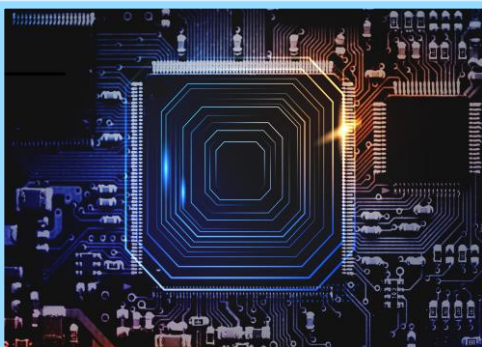
- ✓ Based on Linux OS : Saving OS costs and MS Access License (CAL) costs

- ✓ As well as RTP/RTSP, supports HLS, WebRTC protocol for web-based video control



- ✓ Unlike other VMS, possible to operate up to 100 channels per server without using virtualization ( 500 channel operation recommended )

## Operating Monitoring and Clients



- ✓ High speed decoding of compressed video using GPU built into Intel CPU

## Map Solution

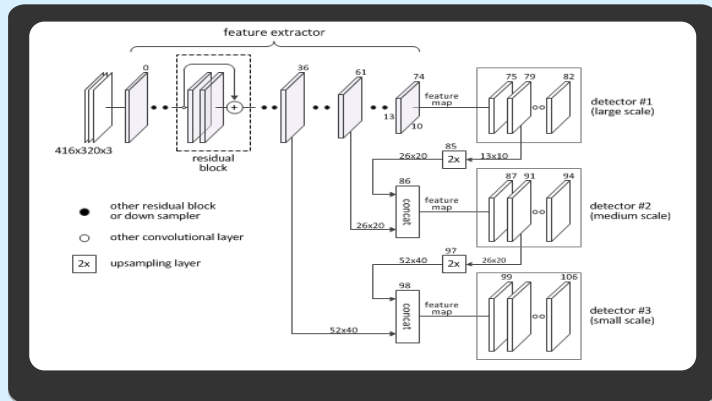


- ✓ Intuitive video control using vector-based or raster-based map images



# 03 Intelligent Object Recognition\_ Key Features

Development of object recognition solution through image analysis based on deep learning



[ network structure of NAIZ deep learning engine ]

- » Deep network with a total of 100 layers
- » With a total of 107 layers, all layers are configured with CNN, regardless of the size of the input image
- » Object detection at 3 different scales
- » detector #1 : detect small objects
- » detector #2 : detect medium sized objects
- » detector #3 : detect large objects

... AI learning using actual CCTV images



[ NAIZ Annotation tool ]



[ NAIZ data processing for learning ]

Securing CCTV images identical to reality not public MS Coco or VOC data

In-house development of annotation tools to process learning data

Securing continuous learning data  
for 4 years by hiring about 10 contract workers ( 2.66 million data learning)

# 03 Intelligent Object Recognition\_ List of Detected Objects



Giving or receiving	Bending down and throwing away	Sitting and picking up	Front face	Side face	Back	Crossing wall	Open umbrella	Folded umbrella	Child/baby
Teenage girl	Twenties (woman)	Thirties (woman)	Forties (woman)	Fifties (woman)	Sixties (woman)	Over seventies (woman)	Teenage boy	Twenties (man)	Thirties (man)
Forties (man)	Fifties (man)	Sixties (man)	Over seventies (man)	Person (unclassified)	Sedan	SUV	Truck	Taxi	Bus
Van	Fire truck	Police car	Ambulance	Car with open door	Car with open trunk	License plate	Hat(cap)	Mask	Hood
Helmet	Bag	Luggage bag	Bicycle	Motorcycle	Kickboard	Stroller, wheelchair	Animal	Fallen person	Flame
Smoke	Smoking person	Person opening or closing a car door	Person opening a car trunk	Bicycle rider	Person dragging bicycle	Motorcycle rider			

# 03 Intelligent Object Recognition\_ Actual Detection Cases during Operation

## Littering

- ✔ Set up video analysis area for areas where illegal dumping is common
- ✔ An event occurs when a person and trash (object) are detected at the same time



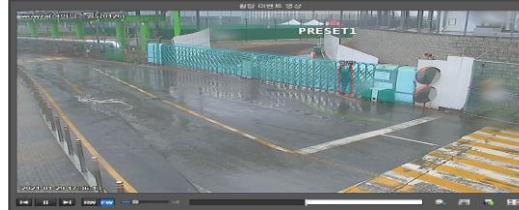
## Smoking in non-smoking areas

- ✔ Set up video analysis area for non-smoking areas
- ✔ An event occurs when a hand moves to the face, and recognizes as smoking



## Crossing wall

- ✔ Set the fence facilities installed around the entire outskirts of the factories of large corporations as the video analysis area to detect wall-crossing attempters through the fence
- ✔ Detect wanderers wandering around the fence by designating the area around the fence as an additional area for video analysis



## Occupying a fire road(illegal parking)

- ✔ Set up video analysis area for the fire road
- ✔ An event occurs when a vehicle stops for a certain period



## Bicycle storage

- ✔ Set up video analysis area for bicycle storage area
- ✔ An event occurs when someone ride or drag a bicycle



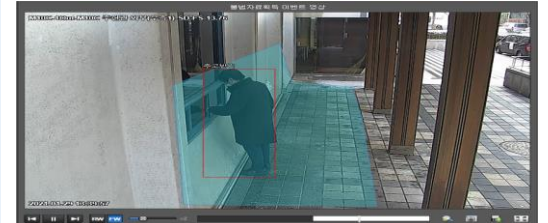
## Fence breakage

- ✔ Detecting people who damage the fence with tools or their bodies
- ✔ Call the manager when abnormal behavior is detected around the outer fence



## Giving or receiving

- ✔ Set up video analysis area inside and outside the outer fence and building windows
- ✔ Analysis of exchanging USB or documents



## Jaywalking

- ✔ Set up video analysis area on roads without crosswalks
- ✔ An event occurs when a person is detected within the area



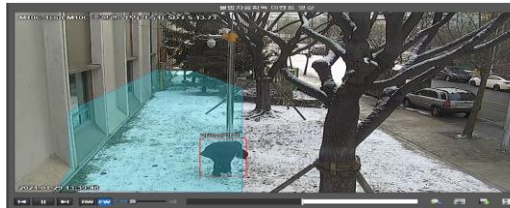
## Safe way home for women

- ✔ Set up video analysis area for the designated area for women's safety on the way home
- ✔ An event occurs when only women are detected



## Bending down and picking up

- ✔ Set up video analysis area inside and outside the outer fence and building windows
- ✔ Analysis of the behavior of bending down to pick up a USB or document



## Fallen

- ✔ Detection of people who have collapsed due to drunkenness or illness
- ✔ Quick action by quick response of control personnel

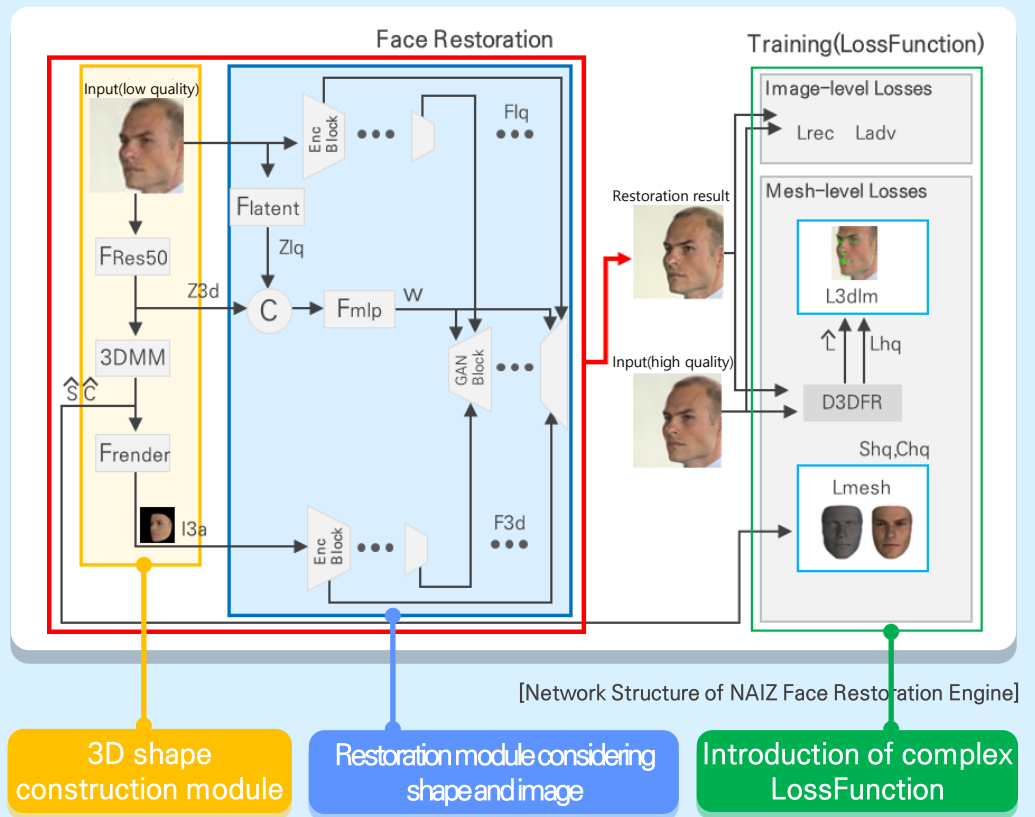


You can see the videos detected during actual operation of NAIZ Intelligence from the next link. [naiz.re.kr:1080/movie](http://naiz.re.kr:1080/movie) Account: movie / movie3515

# 04 Intelligent Face Restoration Solution

## Development of low-definition face restoration solution based on deep learning

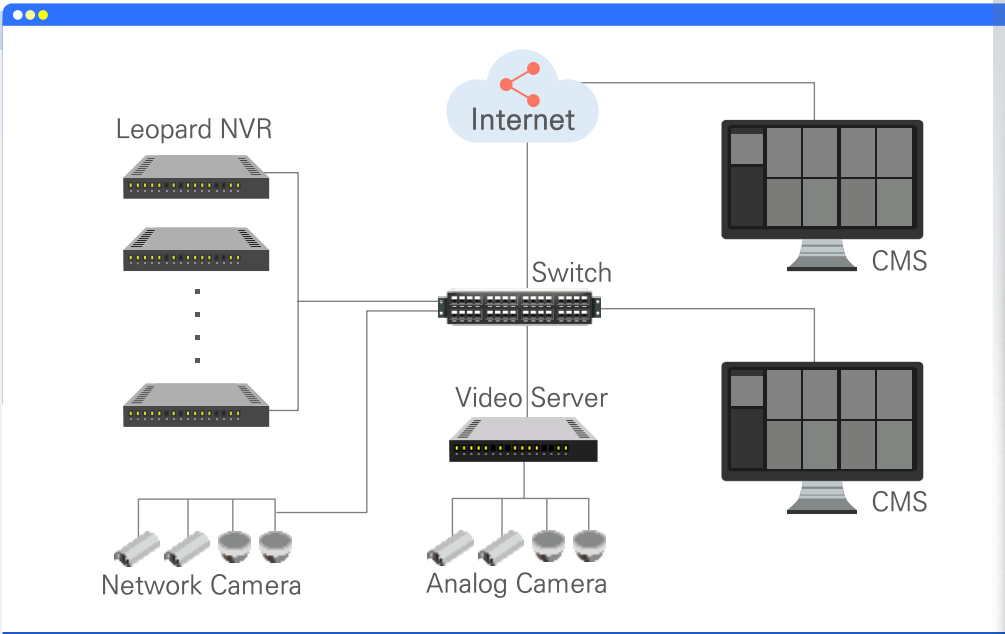
- Restoration module that fuses image and face shape for natural face shape and high-fidelity restoration



## Example of image correction through this solution





# 05 Leopard NVR\_ General / Intelligent

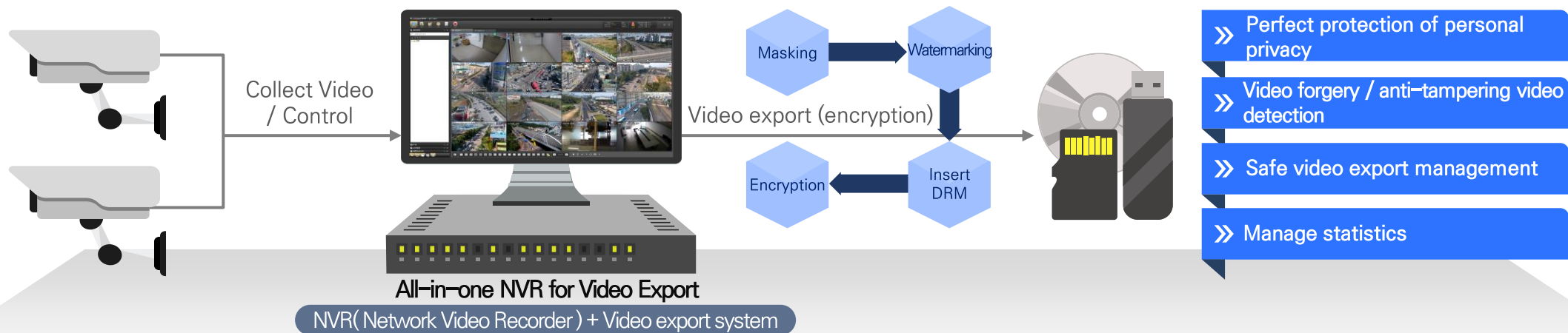


- ✓ Various functions such as video control, recording and playback, and PTZ control
- ✓ Fast monitoring using high resolution and low resolution
- ✓ Support 4K cameras
- ✓ Support Joystick and jog shuttle(USB type)
- ✓ Interworking support by events(preset, warning lights, pop-ups, alarms)
- ✓ Real-time monitoring of camera and storage failure
- ✓ Real-time monitoring of CPU and memory usage

## Specification

Channel		16CH	32CH	64CH	
Display	Camera	Resolution	320 x 240 ~ 1920 x 1080		
		Protocol	ONVIF, RTSP, International Standard Protocol Support		
	Live	Display	Including 1 / 4 / 9 / 16 / 32 / 64, 17 kinds user split screens(customized)		
		Monitor Output	0, 90, 180, 270 Image rotation display		
Etc		Ping Test, Web Page accessible, CPU, memory, real-time failure monitoring			
Performance	Recording	Image compression	H.265, H.264, MJPEG-4, MJPEG		
		Image quality	Full HD 480f	Full HD 960f	Full HD 1920f
		Audio	G.711/ G.726		
	Search / Playback	Recording mode	Manual, continuity, Events / Motions		
		Playback mode	Search for time, bookmarks, events		
	PTZ control	Split screen mode	Simultaneous progress of 4 channels		
		Back up	AVI(Simultaneous progress of 4 channels), MP4 Viewer Built-in back up		
HW	Mouse, keyboard	Using Directional and Shortcuts			
	Joystick	USB type joystick support(optional)			
	CPU	16CH : i3	32CH : i5	64CH : i7	
	HDD	Supports 6Bay SATA(OS x 1ea, Recording x 5ea)			
	Memory	16GB or greater		16GB or greater	
	NIC	10/ 100/ 1000 1port			
	Graphic	Intel UHD 630 or greater			
	Power	600W(single power)			
	OS	Windows 10 Pro 64bit			
	Weight	12.3Kg(excluding HDD)			
Dimension	2U	430(W) x 85(H) x 550(D)		4U : 430(W) x 175(H) x 470(D)	
					
Power Consumption		450W(rated 600W)			

# 05 Leopard NVR\_ All-in-one NVR for Video Export



## Stable video control and video export

- ✓ Accommodates all functions of the company's NVR
- ✓ 16, 32, 64CH various products and over 100CH made to order
- ✓ Single system configuration: storage distribution + management + control + video export

## Personal information protection

- ✓ Personal privacy masking based on the Personal Information Protection Act
- ✓ Video can be played when user password is entered
- ✓ Provides function to limit the number of playbacks and playback period through DRM application

## Prevention of video forgery

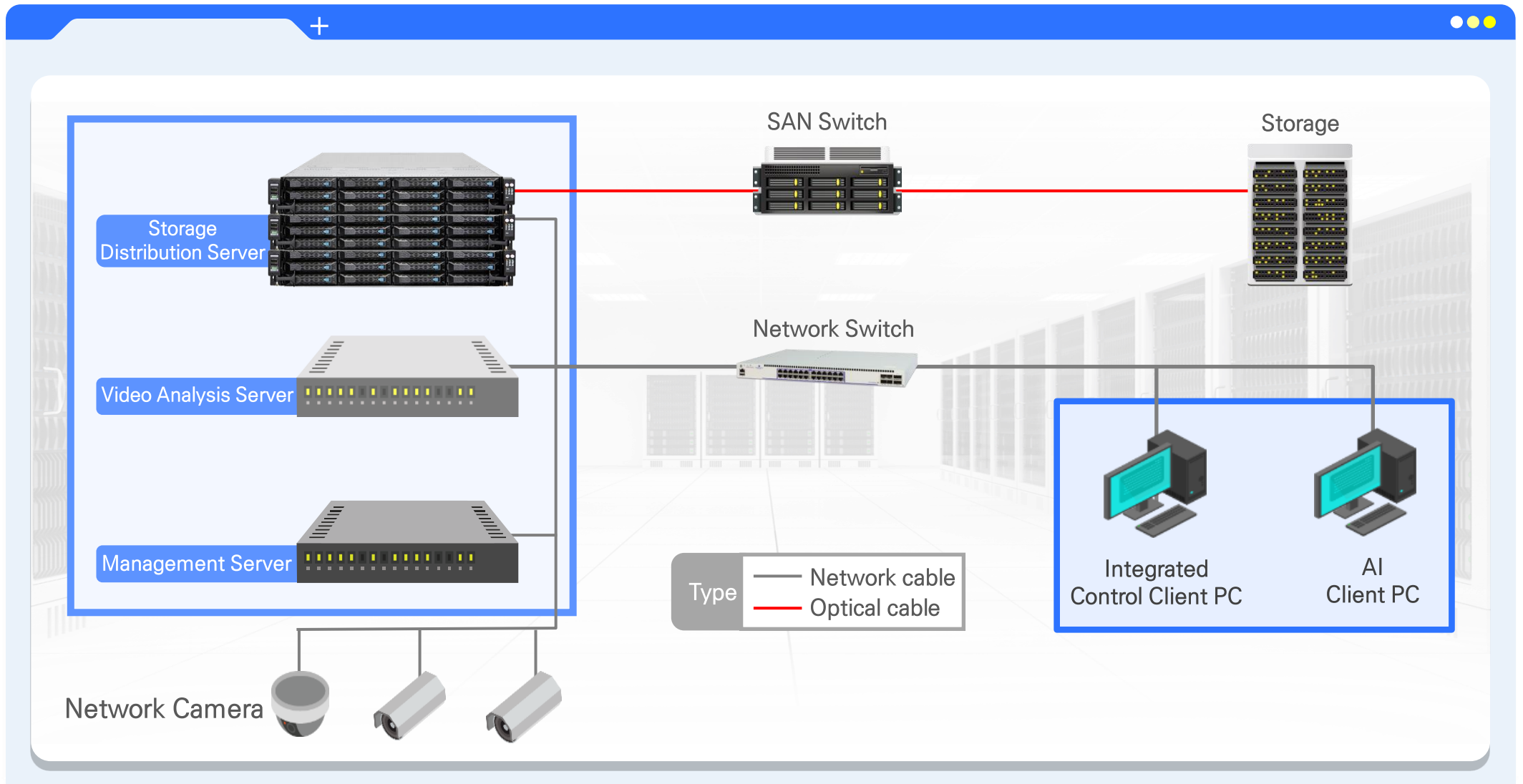
- ✓ Image and text watermark support
- ✓ Apply zero watermarking technique that is robust against video attacks (compression, modulation, etc.)
- ✓ Tracking the leak path in case of video leak

## Introduction effect

- ✓ Perfect security of personal information (personal video) in CCTV data
- ✓ Encrypted storage when exporting video to prevent secondary damage due to leakage
- ✓ Block illegal video distribution, forgery, and copying when viewing and export video

“CCTV video control and video export **in one NVR**”

# 06 NAIZ Solution Configuration





# NAIZ Co., Inc.

For Better Safe World

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