HANCOM InSpace

The Integrated Space-to-Ground Data Value Chain: Approach to Digital Earth Intelligence



2025. 09. 03.

HANCOM INSPACE

DONGEON KIM

Business area.

All in one – Space data Fusion Decision Support Service Provider

‘ Earth Image Information + GIS Spatial Information + Open Data ‘



The Only One

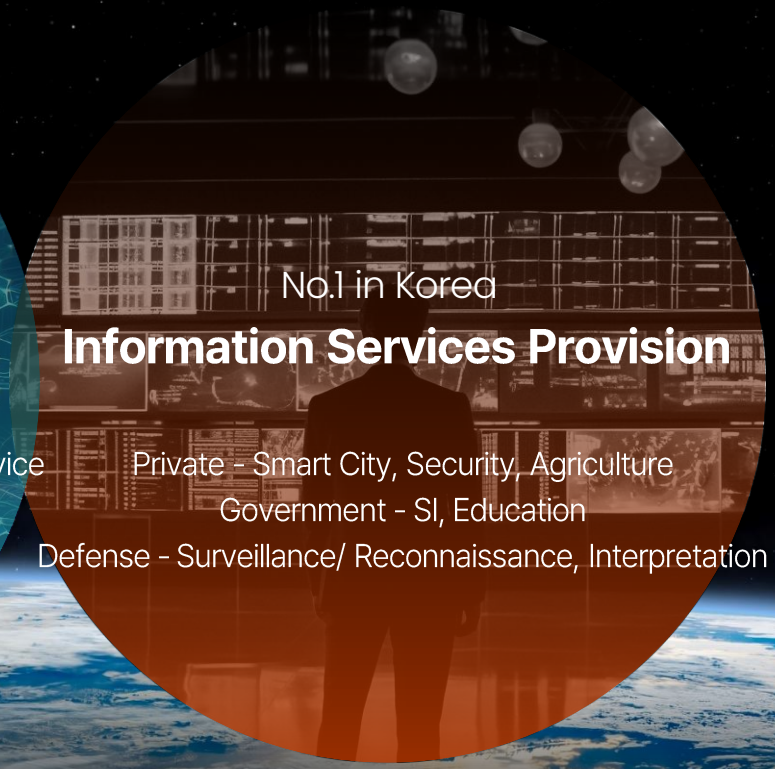
Data Collection System

[SPACE] SEJONG Series
[AIR] HD Series
[LAND] Sentry

Global Top-tier

Multi-Intelligence

Image Signal Social Data Convergence Solution Service
(InStation, ORCA, Cloud)



No.1 in Korea

Information Services Provision

Private - Smart City, Security, Agriculture
Government - SI, Education
Defense - Surveillance/ Reconnaissance, Interpretation

Decision-Making Support Solution Based on Image Data from 'SPACE ↔ AIR ↔ GROUND'

Integration Service using SPACE-AIR-GROUND Data

Implementation of a User-Centric Data Fusion

- ☑ Satellite Development
- ☑ Ground Station Subsystem
- ☑ Satellite Image Analysis and Sales

Space Industry

- ☑ Automated Drone Operation System Development
- ☑ Drone Control SW
- ☑ Drone Image Analysis and Sales

Aviation Industry

- ☑ High-Performance Camera Sensor Development
- ☑ AI-based Multipurpose Surveillance Solution

Ground Industry



Data Digitization Technology

- ☑ Data Generation & Acquisition
- ☑ Satellite, Drone, Ground Sensors

Information Technology

- ☑ Data Processing & Utilization
- ☑ Database Implementation

Multi-Intelligence

- ☑ Logical-Spatial **Data Fusion**
- ☑ Advanced Data Development through Artificial Intelligence and Data Fusion

Smart Service Technology

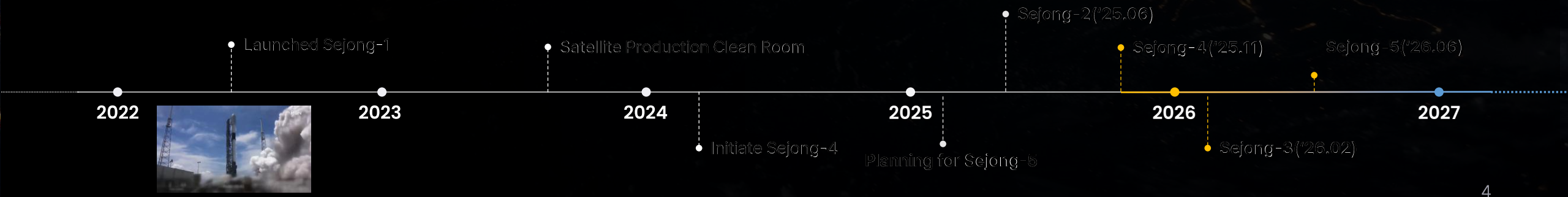
- ☑ Providing Insight Intelligence Augmentation
- ☑ Decision Support through Data Processing and Visualization

Full Package Technology for the Collection, Analysis, Provision of Aero-Space Data

SEJONG Earth-Observation Satellite Constellation

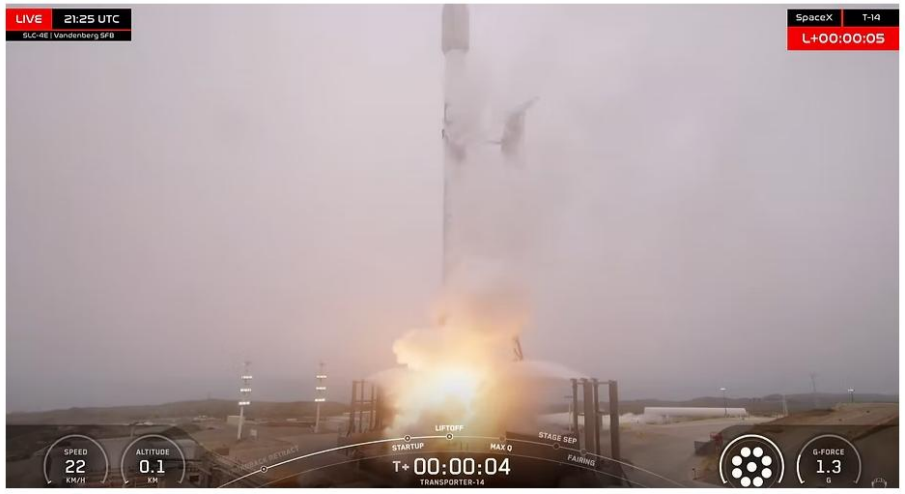
Launch Schedule in 2025 - 2026

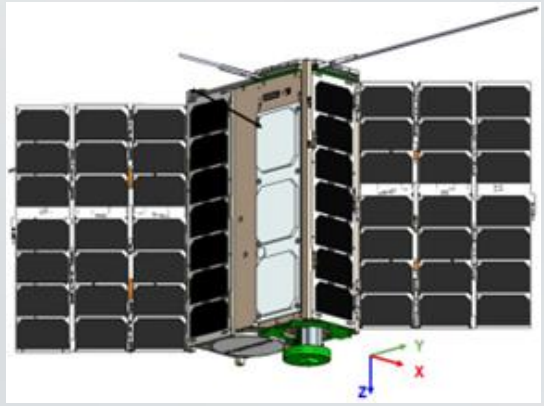
	Korea's First EO Commercial Satellite			Nuri 4th Launch	Nuri 5th Launch
	Sejong-1	Sejong-2	Sejong-3	Sejong-4	Sejong-5
Launch Date	May 26, 2022	June 24, 2025	February, 2026	November, 2025	June, 2026
Orbit	LEO, 530km	LEO, 590km	LEO, 500~600km(TBD)	LEO, 600km(TBD)	LEO, 500~600km(TBD)
Weight	10.8kg	10.8kg	10.8kg	≤11kg	≤12kg
Band	7 bands (Multispectral)	8 bands (Multispectral)	**442 bands (Hyperspectral)**	8 bands (Multispectral)	Chip-scale Atomic Clock (CSAC) Payloads Retroreflector
Size	6U				
Swath	20km				
Resolution	GSD 5m				-



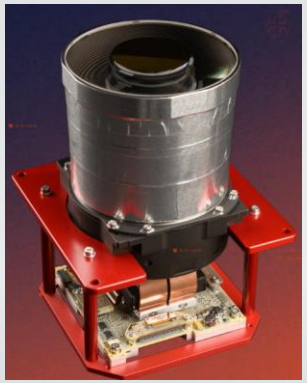
SEJONG-2

한컴인스페이스, 지구관측 위성 '세종 2호' 궤도 안착 성공





< SEJONG-2 >



< Multispectral Camera >

SEJONG-2 Specification

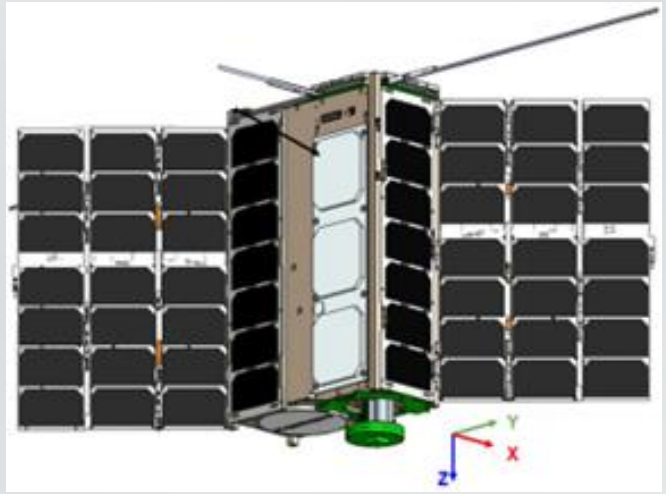
Category	Specification
Name	SEJONG-2
Orbit	590km, Sun Synchronous Orbit(SSO)
Weight	≤ 10.8 kg
Size	6U(20 x 10 x 30cm)
Payload	Multi-band EO Camera, 8 Bands Swath 20 km, GSD 4.75 m @ 500km
TC/TM	UHF
Datalink	X-band

Launched Date

Category	Contents
Launch Vehicle	Space-X Falcon 9
Date	**2025. 06. 24**

SEJONG-3

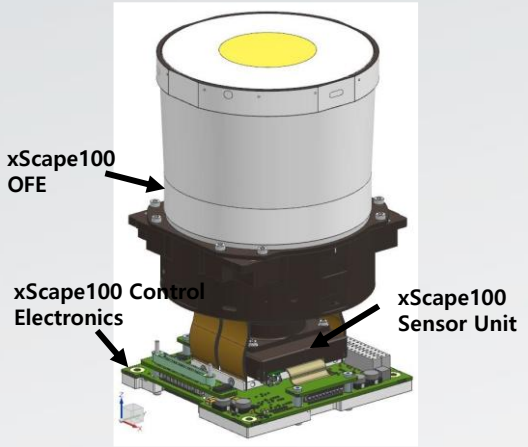
Korea's ***first low-orbit commercial hyperspectral satellite***, and is playing a pioneering role in the use of HS satellite imagery in Korea



SEJONG-3 Specification

Category	Specification
Name	SEJONG-3
Orbit	550~600 km(TBD), Sun Synchronous Orbit(SSO)
Weight	≤ 10.8 kg
Size	6U(20 x 10 x 30cm)
Payload	Hyper Spectral EO Camera, 442 Bands Swath 20 km, GSD 4.75 m @ 500km
TC/TM	UHF
Datalink	X-band

Hyperspectral Camera

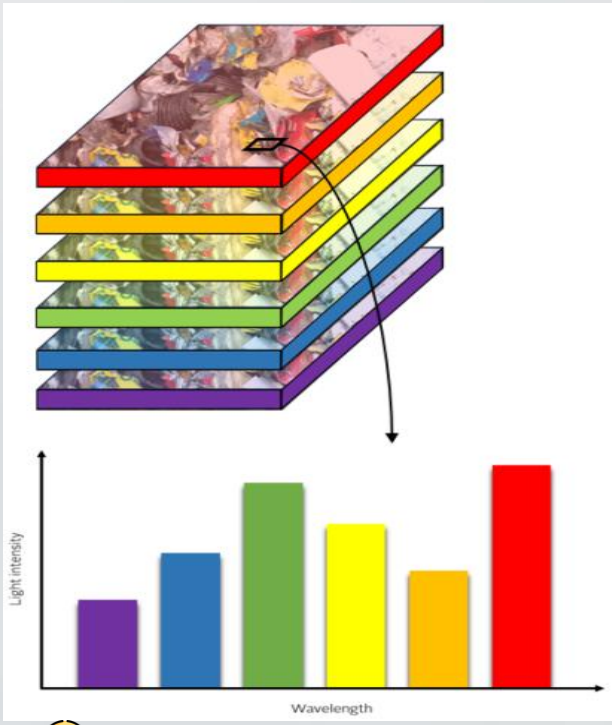


Category	Specification
Spectral	Hyper Spectral
Spectral Bands	442 ~ 884 nm(442 Bands)
GSD	4.75m @ 500km
Mass	1.26(±5%)kg

What and Why Hyperspectral?

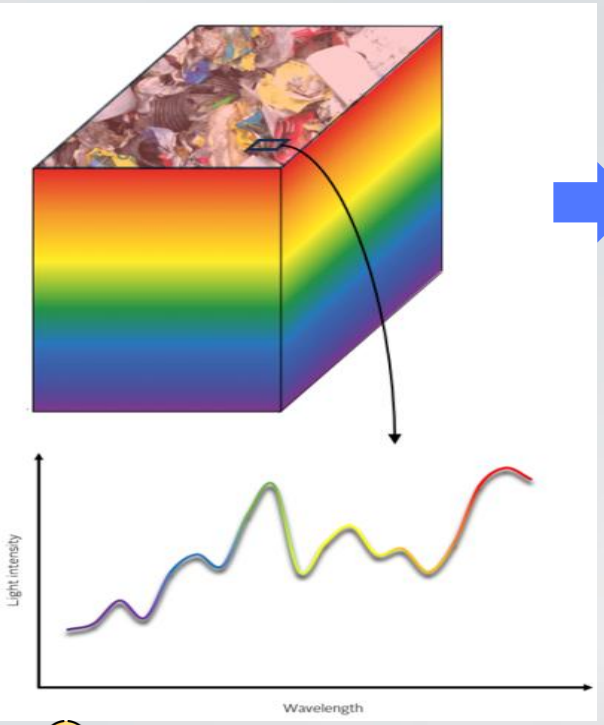
➔ Analyze detailed characteristics of objects more accurately using light of various wavelenths

Multispectral Sensor

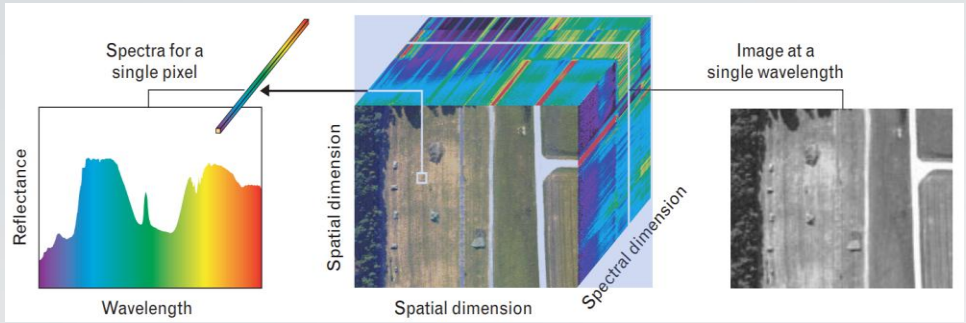


Observation of R, G, B and several disconnected spectral bands

Hyperspectral Sensor



Observation of tens to hundreds of continuous spectral bands



POINT

Classify and detect the **unique reflectance characteristics(Spectral Signature)** of each feature on the Earth's surface in detail

POINT

Detailed **surface classification and generation of surface reading** information compared to MS

POINT

Possible to obtain **various spectral information simultaneously**, so that the user can select and utilize the optimal spectral wavelength for each task.

Potentail applications of hyperspectral technology in defense

Applications: Battlefield information gathering, target and decoy discrimination and camouflage identification

Defense Application	Operation	Spectral Types	Onboard platform
Battlefield information	**Situational awareness**, Monitoring	**VNIR**, SWIR, LWIR	Aircraft, **Satellite**
Target, Decoy discrimination	Reconnaissance	**VNIR**, SWIR, LWIR	Ground, Aircraft, **Satellite**
Camouflage identification	Reconnaissance	**VNIR**, SWIR, MWIR, LWIR	Ground, Aircraft, **Satellite**
Long-range guided wapon early warning	Reconnaissance	MWIR, LWIR	Ground, Aircraft, **Satellite**
WMD Detection	Reconnaissance	MWIR, LWIR	Ground, Aircraft, **Satellite**

출처) M. Shimoni, R. Haelterman, and C. Perneel, "Hyperspectral Imaging for Military and Security Applications," IEEE Geoscience and Remote Sensing Mag. pp. 101-117, Jun. 2019.

※ VNIR : Visible Near Infrared, SWIR: Short Wave Infrared, MWIR: Medium Wave Infrared, LWIR: Long Wave Infrared

※ SEJONG-3's HS is VNIR type.

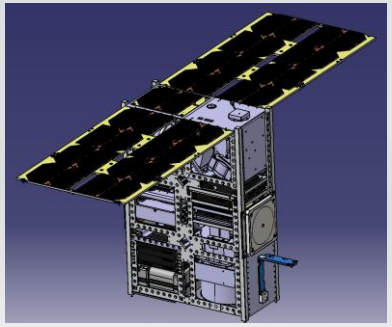
SEJONG-4 & SEJONG-5

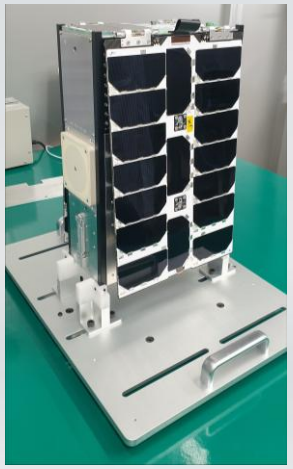
SEJONG-4 Specification

Category	Specification
Name	**SEJONG-4**
Orbit	**600km, SSO,**
Weight	**≤ 11kg**
Size	**6U(20 x 10 x 30cm)**
Power	**≤ 34Wh**
Payload	**Multi Spectral EO Camera, 8 Bands**
TC/TM	**S-band**
Datalink	**X-band**

Earth Observation

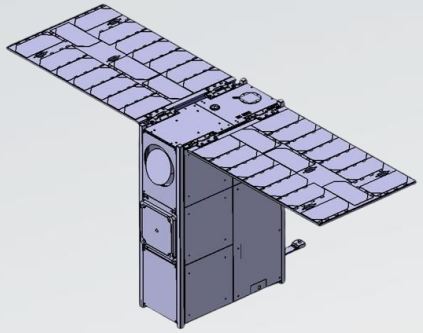
In-house development





SEJONG-5 Specification

Category	Specification
Name	**SEJONG-5**
Orbit	**500km, SSO**
Weight	**≤ 12kg**
Size	**6U(20 x 10 x 30cm)**
Power	**≤ 40W**
Payload	**Chip-scale Atomic Clock (CSAC) Payloads Retroreflector**
TC/TM	**S-band**
Datalink	**X-band**



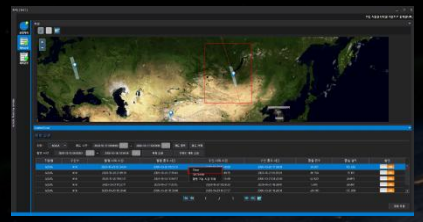
First development of CubeSat-based LEO-PNT research, including test of Chip-scale atomic clocks and Retroreflector

Feasibility of utilizing high-precision PNT service

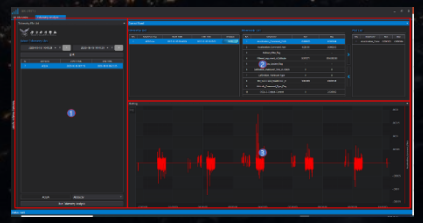
HANCOM InSpace Ground Station SW

Development of Satellite Operation System and Global Image Data Solution

Ground Station SW







Flight Dynamic System(FDS)
⇨ Orbit prediction using TLE

Mission Planning System(MPS)
⇨ Satellite mission configuration

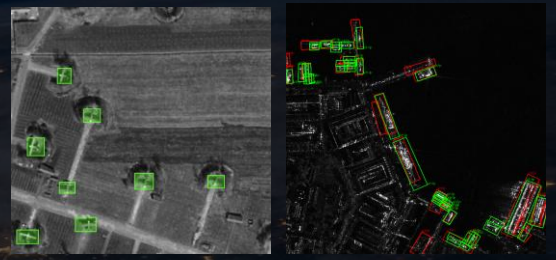
Satellite Simulator System(SIM)
⇨ Virtual orbit configuration and image capturing simulation

Satellite Operation System(SOS)
⇨ Satellite command generation and status data monitoring

Tracking, Telemetry and Command(TT&C)
⇨ Receiving command information anaylsys through orbit calculation

Danuri, Korea's Lunar Exploration Obiter
KARI, KASI, KMA, NMSC etc.

Image Data Analytics







Multi-source Image Fusion System (Specialized for Military Surveillance and Reconnaissance)

AI Object detection based on SAR, EO, IR sensors

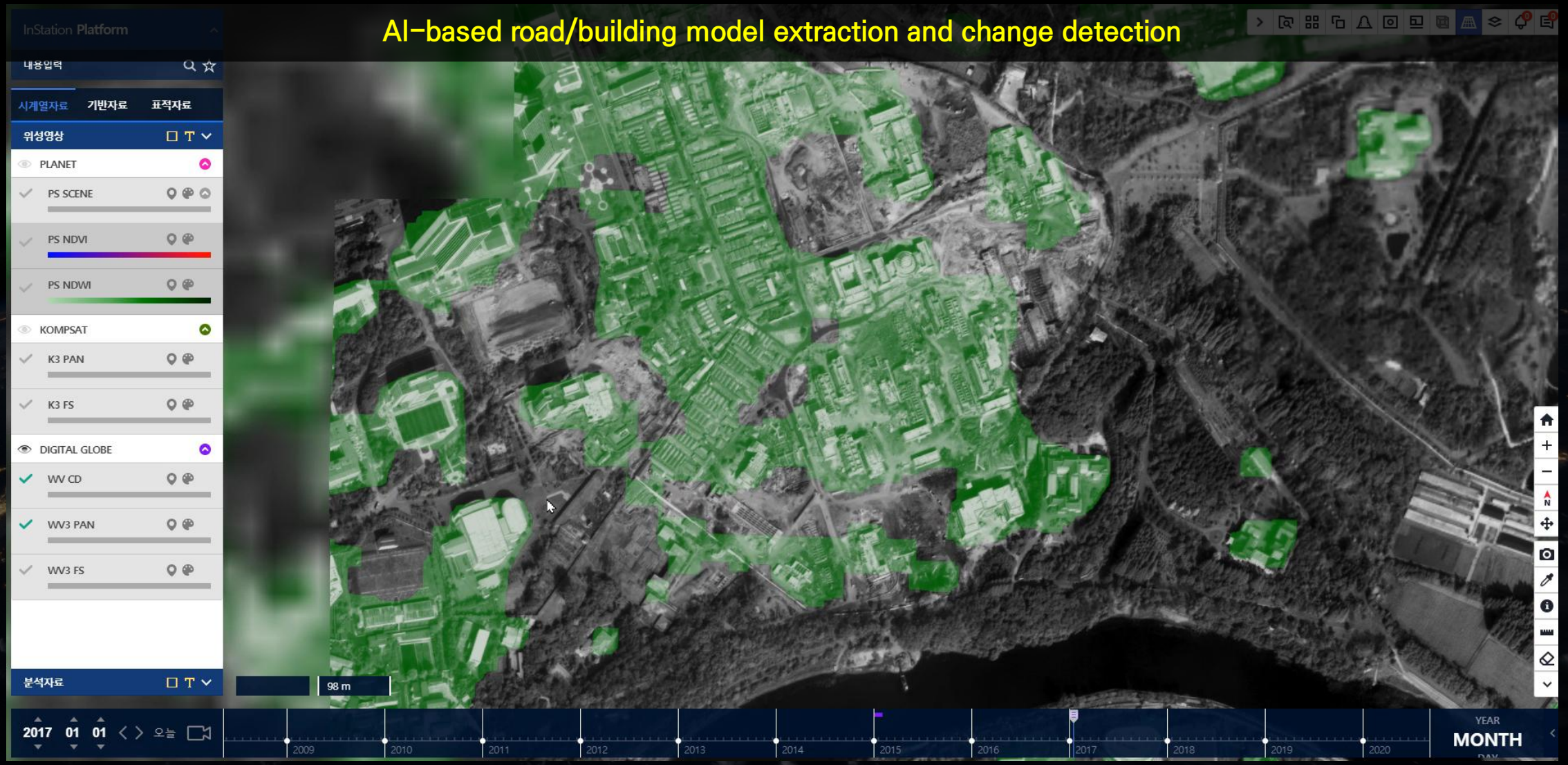
Change Detection for disaster, surveillance

Agricultural environment, Forest resource management, Disaster monitoring

AI Profiler - AI-Based Intelligent Image Interpretation Service
InSight - Image Interpretation Solution (GS Cert obtained)

InStation Platform Change Detection

- Detection of changing areas such as buildings and roads using satellite image analysis



InStation Platform Super-Resolution

Image Analysis and Super Resolution

Rapid Image Analysis with Enhanced Images

Speeds up analysis with super-resolution enhancement of multi-sensor images, supporting diverse analysis outputs.

Image Processing and Photogrammetry

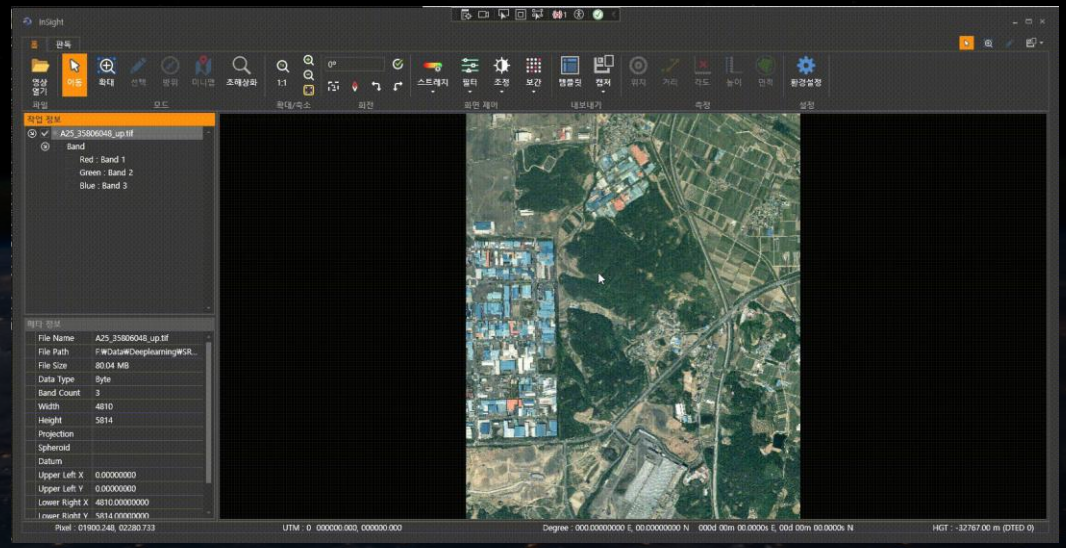
Enhanced Analysis Accuracy and 3D Geospatial Processing

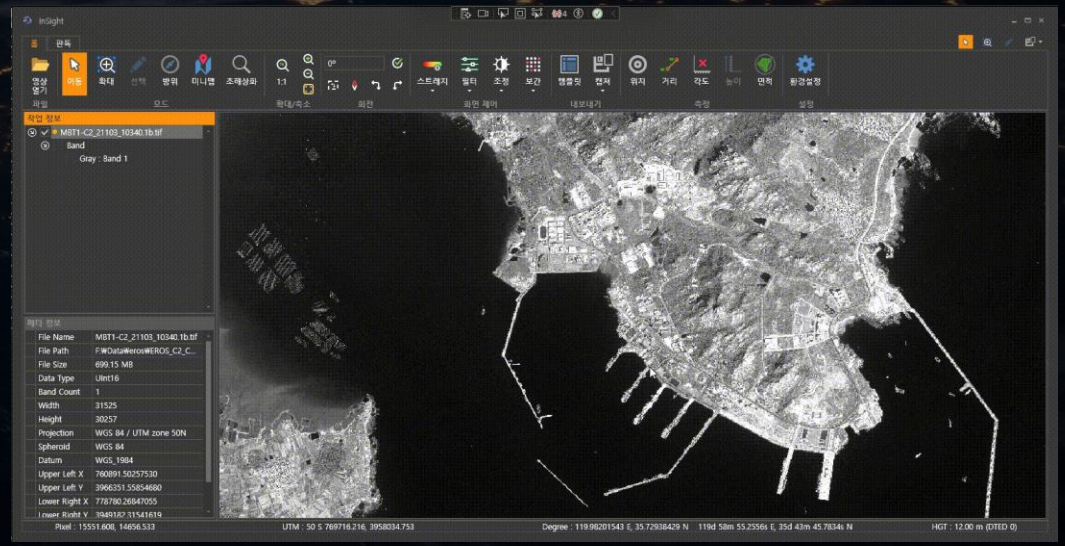
Provides on-the-fly adjustments for image quality, filters, and color, plus 3D geolocation with sensor model accuracy.

Editing Tools

Diverse Authoring Tools for Comprehensive Report Generation

Enables comprehensive report generation and results sharing with flexible editing tools and utilities.





InStation Platform Object Detection

Object Detection and Label Export

Concurrent Object Detection & Training Data Generation

Object detection with visualized, analysis-ready results, easily converted to standard formats for streamlined dataset creation

AI Model Management

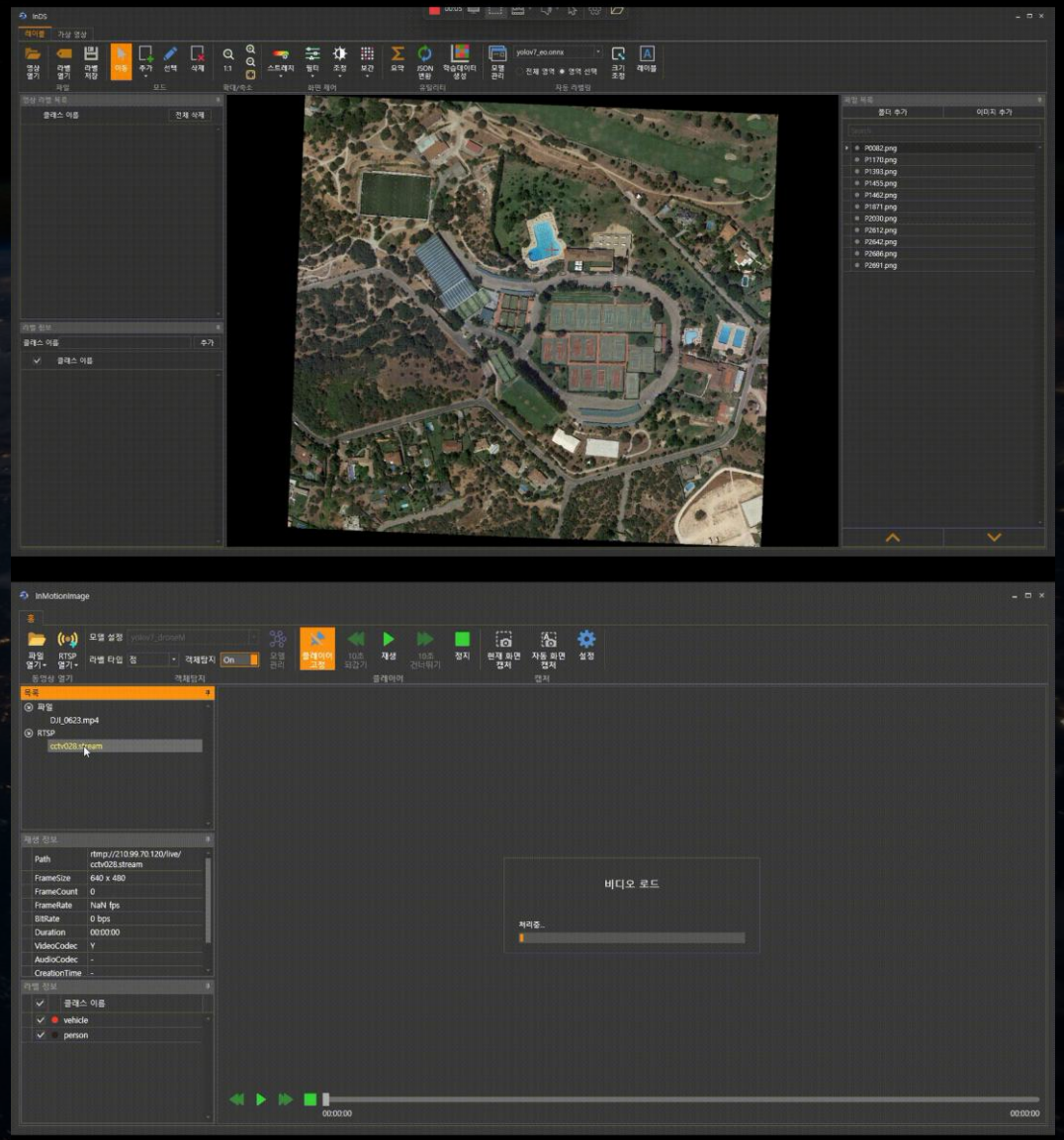
Enable operational flexibility with plugin-based AI

We provide a user environment that enables the operation of diverse AI models, built on plugin-based AI model management

Streaming and Data Processing

Real Time Object Detection and Live Streaming

Ingest RTSP-based streams—UAV, Drones, CCTV, and live feeds—in real time for AI-driven analytics.

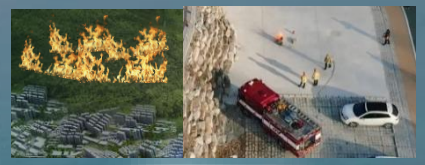


Fully Automated Drone Operating System

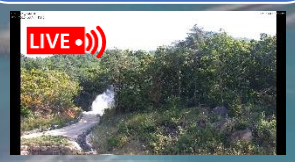
Disaster Monitoring



Emergency Response



Remote Control and Live-streaming







AI Image/Video Analysis





Emergency Manual Control

Automated Precision Landing

Emergency RC Controller





Drone-Station



Real-time streaming
Flight status
Collision avoidance

Interface

Drone Flight Control

Multiple Video Control

Station Control

Control Situation Room

Automated Drone Operating System



HANCOM Drone Series

Mini UAV for Military



Model	HD-300
Size	290×290×150 mm
Weight	Up to 1.8kg
Flight Time	25 min
Max speed	8m/s
IP rate	-
Payload	EO Camera, Chemical Detection, Communication encryption

Multipurpose Medium Sized UAV



- EO : 2640 x 1520(Person detection 500m)
- IR : 640 x 512(Person detection 250m)
- 10x Optical ZOOM

Model	HD-550-MIL
Size	510 x 510 x 340 mm
Weight	Up to 4.95kg
Flight Time	30 min
Max speed	12m/s, -20℃ ~ 43℃
IP rate	IP43
Payload	EO/IR Camera, Communication encryption

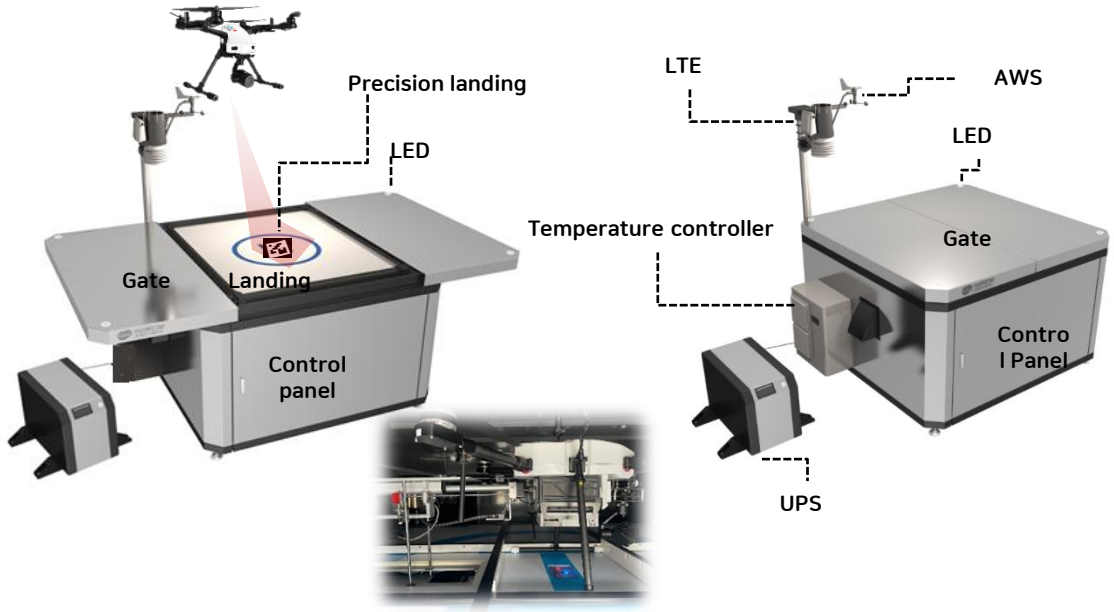
Multipurpose Medium Sized UAV



Model	HD-850
Size	850x700x500 mm
Weight	Up to 10kg
Flight Time	30 min
Max speed	15m/s
IP rate	IP43
Payload	EO/IR Camera, Delivery, Communication encryption

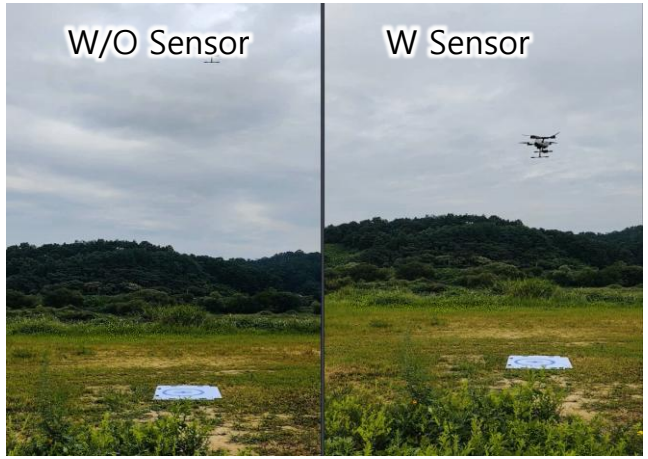
Fully Automated Drone Station

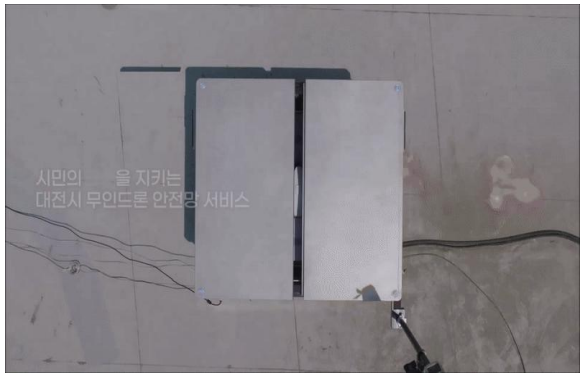
DroneSAT



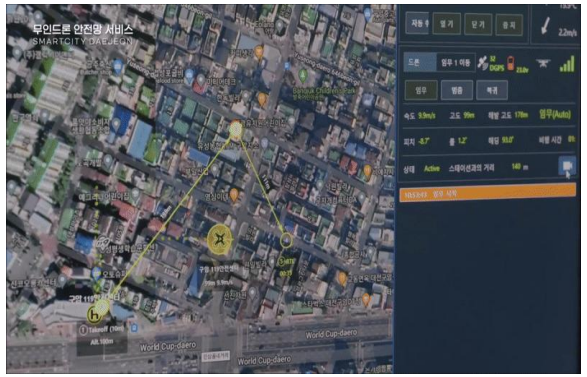
Drone Station

- Automatic charging
- Automated Weather Station
- Water proof
- Image analysis server
- Support precision landing



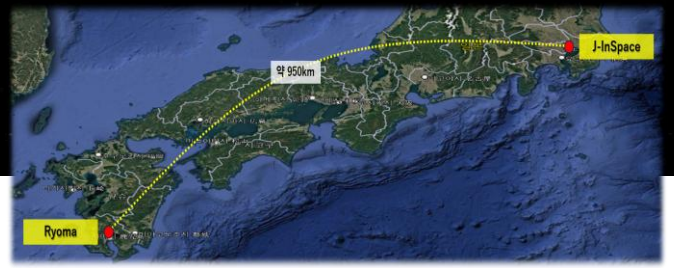








Solar Panel Inspection and Security Monitoring

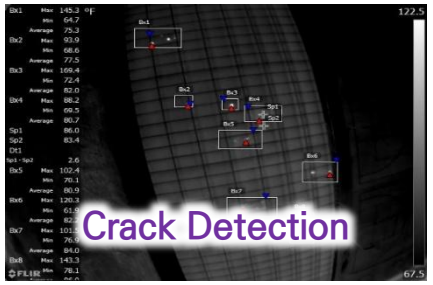


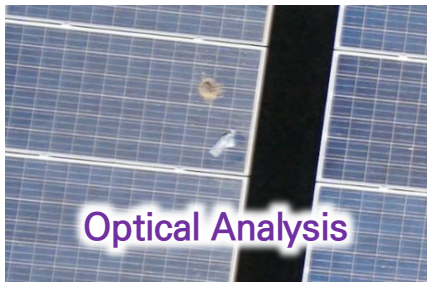
Solar Farm Security Monitoring in Japan

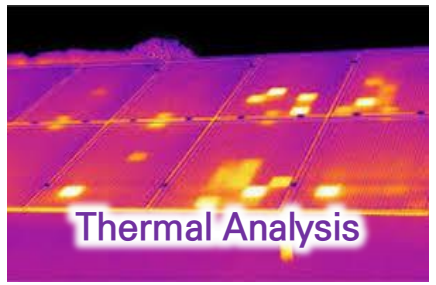




Panel Inspection







Security Monitoring





PTZ EO/IR Surveillance Solution

HANCOM InSpace

Customizable Long-range & High-performance Cameras



MIL-Spec Day/Night Surveillance Cameras





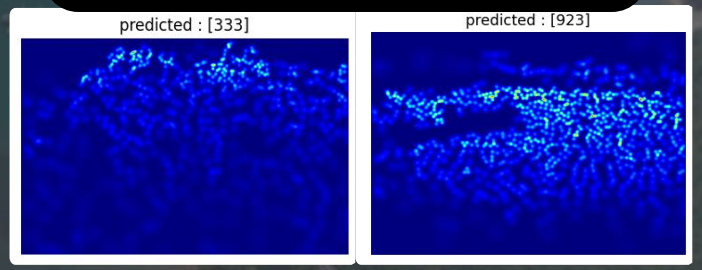
High Resolution Surveillance Camera
⇀ Up to 50km detection(Car), 135x Optical zoom

ZLID Technology
⇀ Day/Night long range target detection via Zoom Laser IR Diode

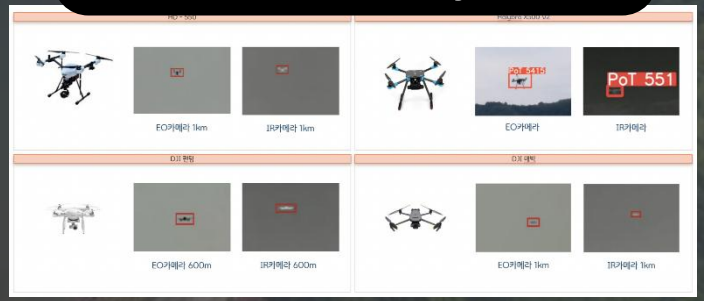
AI-Based Counter-Drone System
⇀ Multi-drone detection based on imagery up to 3~5km

AI based Drone – Camera Surveillance System
⇀ Satellite command generation and status data monitoring

Crowd Monitoring



Counter-Drone System



Wildfire Hot Spot Detection



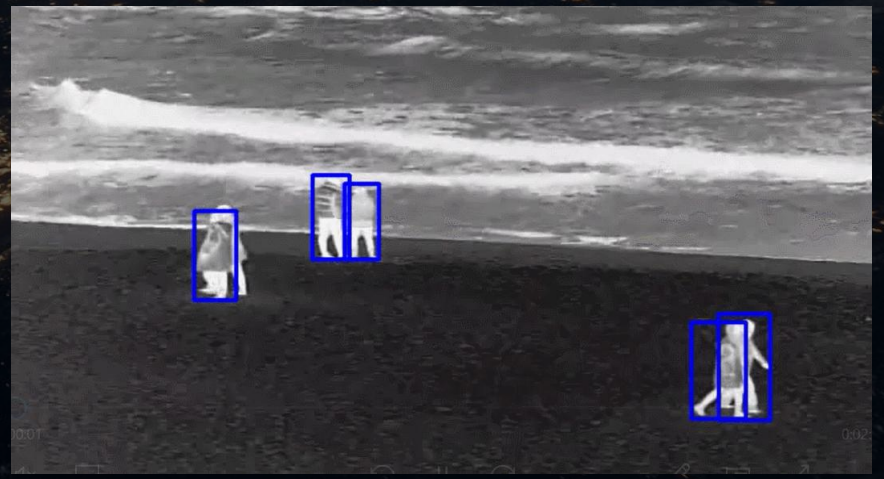
EO/IR Sensor Day/Night Object Detection

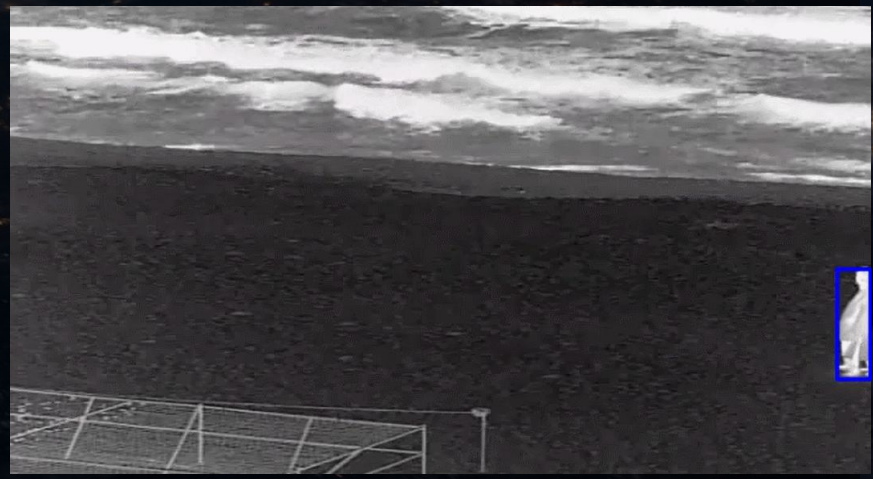








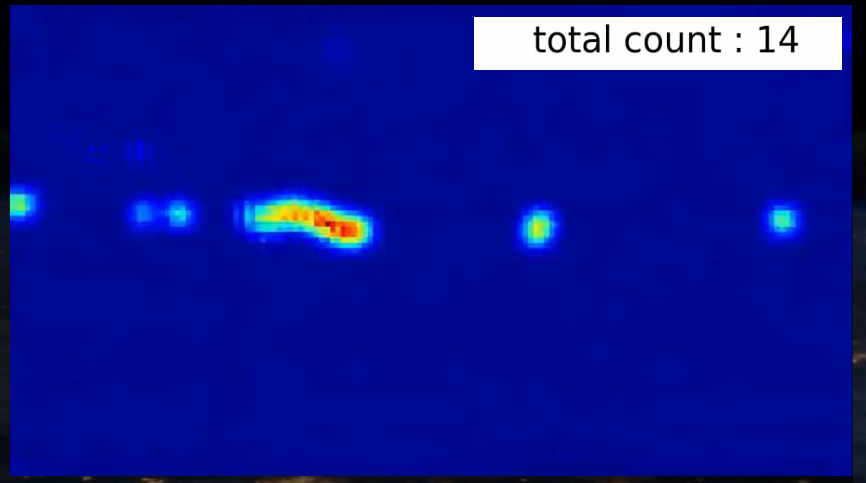




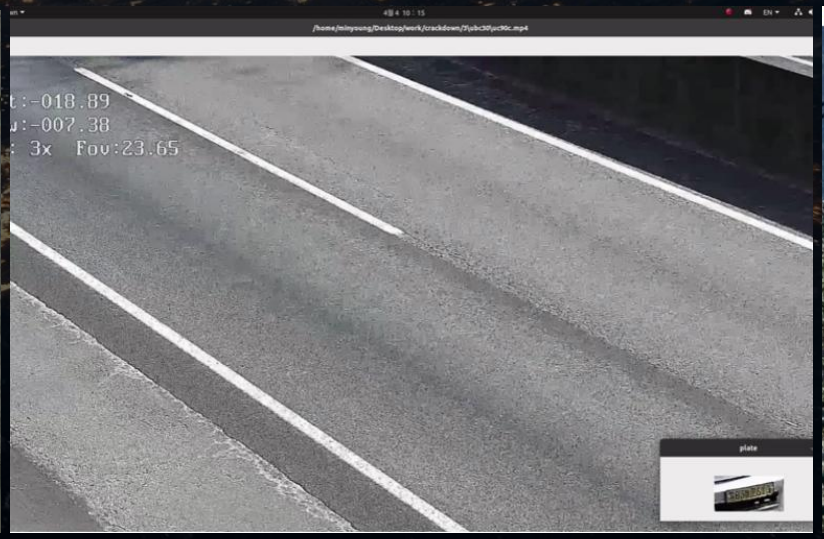
AI-Based Object Detection and Recognition (Civil Sector)











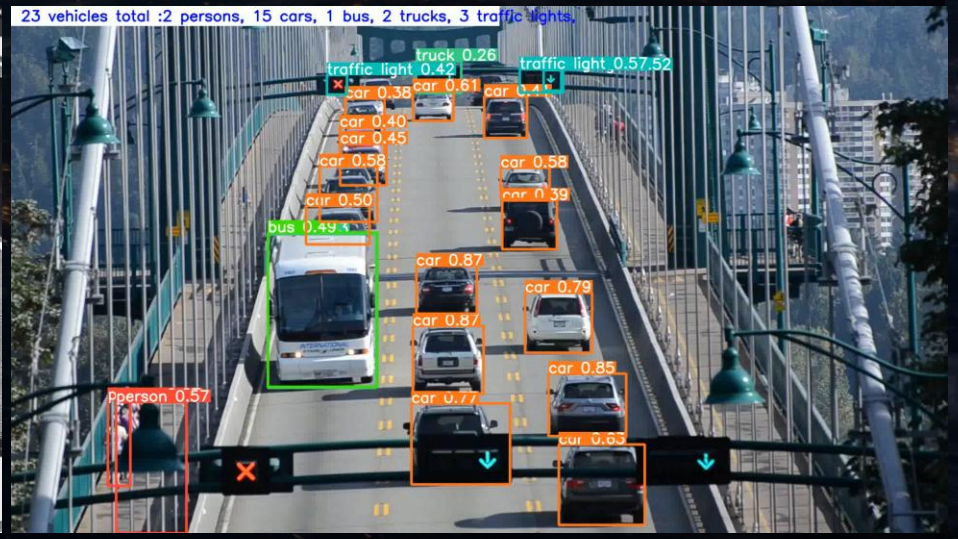
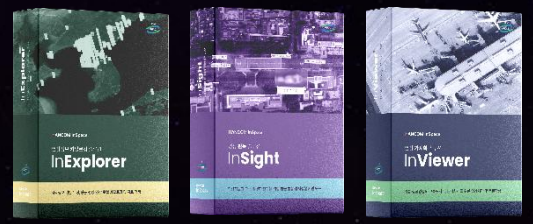
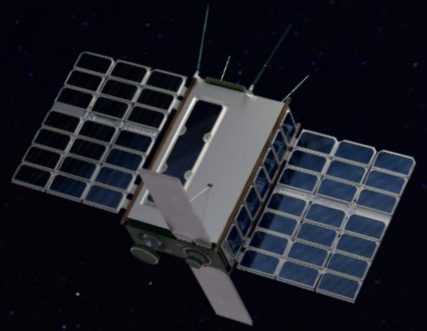


Image data service belt covering SPACE – AIR – GROUND





- 5m Res.
- Various Sensor Options
- Constellation-Operation

Customer

Oversea Domestic

Military
Government
University
Industry
Institute
⋮

Data Order

Data Sales

Data Download

Mission Control





- Drone Series
- Autonomous
- EO/IR Camera
- Non-Pilot system

Analysis

Data Order
(Mission Plan)

Data Transfer(Raw Data)

Control

Mission Control

Data Download

Mission Control

Data Transfer



- PTZ Long-Range Camera
- EO/IR
- Max 135x zoom (EO)
- Operation : -50°C to +65°C, IP67
- DRI
  : Person - 27km, Car - 50km

Full Package Technology



Image Processing

Data Analysis

Sales Marketing

Operation System

Data Hub

HANCOM InSpace



Decision Support Technology through

Space Information Fusion

'Image data service belt covering **SPACE ↔ AIR ↔ GROUND**'

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