CODEVISION Inc.

AI-Specialized R&D Company

1. CODEVISION Introduction

CODEVISION 코드비전 주식회사

Pioneering a Better Future with AI

AI R&D Company, Codevision Specializing in Image & Signal Processing

Codevision delivers **AI software solutions** across diverse industries using deep learning-based technologies.

Leveraging real-world field data,
we develop core AI technologies and services
to provide customized solutions tailored to client's needs.

AI One-Stop Solution : Data / AI Tech / AI Platform & Application
Developing customized AI solutions based on deep learning

Trusted AI R&D Leader
Selection of Numerous R&D Projects and Proven Successful Outcomes

Global AI Expertise Partner
Extensive on-site experience
: Facilities / Equipment / Partner Companies Ready

|	
Name	Codevision Inc.
CEO	Eungyeol Song
Establishment	2018 / 11 / 10
Address	- Yonsei University Engineering Research Park 242, 50 Yonsei-ro, Seodaemun-gu, Seoul, Republic of Korea - 16F 29, 33, Pyeongsan-ro, Uichang-gu, Changwon-si, Gyeongsangnam-do, Republic of Korea
Business	**Data** **AI Tech** **AI Solution** **SaaS**

Business

We provide **deep learning-based, customized AI technologies tailored to clients**, built on data collected directly from the field.

AI One-Stop Solution

AI Data

**Industry Tailored High-Quality Dataset Construction Service**

- Expert consulting by data specialists
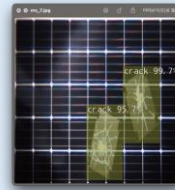- Custom data processing platform
- Field-optimized dataset
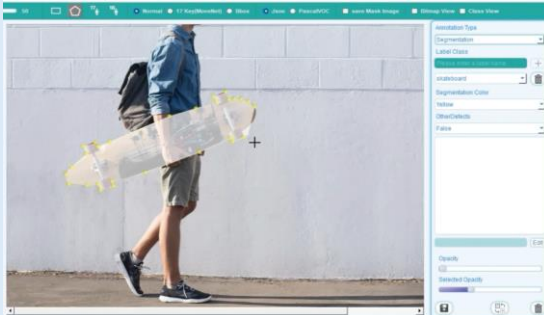
AI Tech

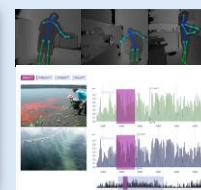**AI Research & Development for Vision / Signal Processing**

- Custom AI development for server, cloud, edge environments
- Data-centric problem solving for diverse data types
- Easily integrable as APIs for various systems and workflows
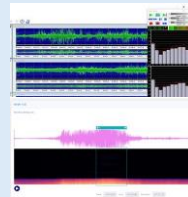
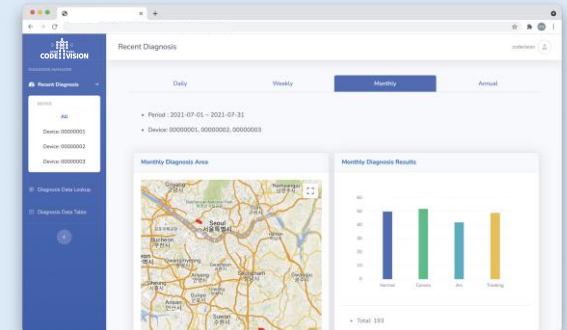1-Dimensional (ultrasound, IoT) | 2-Dimensional (image, video) | 3/multi-Dimensional (Depth, Lidar)

AI Solution

AI Platforms & Application Development

- AI training, model management, and monitoring
- MLOps-based platform for continuous operations
- Intuitive tools accessible even to non-experts

Our experts cover the entire AI pipeline,
from data acquisition to full operational deployment of AI solutions.

Various Custom AI Solution Options

"AI infrastructure and operational systems optimized for client's environment"
we deliver tailored AI solutions based on each client's needs.

On-Premise Server

AI system deployed within the **client's internal infrastructure**

Enhanced security and flexible operation within a private environment

Independent operation over internal network

Ideal for handling sensitive data & integrating with internal systems

Ex. security-critical industries such as healthcare, finance, etc.

Codevision-Owned Server

Operates and manages dedicated GPU servers (e.g., NVIDIA A100, H100)

Provides custom server specifications based on **client requirements and usage**

Offered at a **cost-effective price** point

Ex. GPU hosting service for AI model training & inference

Cloud Servers

Training, Deploying, and Operating AI Models & Solutions using **domestic and global Cloud Providers servers**

Elastic scalability on resource demands & Flexible infrastructure

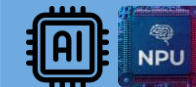

Ex. AWS, GCP, Azure, etc.

Edge AI

- Distributed architecture that runs AI directly on-site where data is generated
: Real-time, low-latency inference

On-Device AI

AI execution within **standalone devices**
Ex. Smartphones, Cameras, Drones

Embedded AI

AI running on **ultra-compact, low-power embedded chipsets**
Ex. IoT, NPU, MCU

Case

Our expertise has been validated through successful projects in diverse sectors such as manufacturing, mobility, environmental technology, and healthcare.

CODEVISION Homepage

https://codevision.kr/en
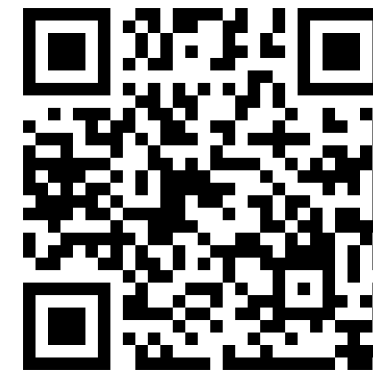
Innovate the industry with CODEVISION !

Partners

Clients who have partnered with CODEVISION

02. Manufacturing AI Development Case

Detection & Recognition Solution

Vision AI Technical Skills

Applicable across **various industries** through the deployment of AI-based detection and recognition models

- Even without pre-existing data, we can development AI solutions by constructing the necessary datasets.

- Easy access and usage through intuitive app/web-based platforms

- Reliable AI model trained on high-quality data

Business

Use Cases

Anomaly Monitoring

Defect and Fault Detection

Automation & Operator Assistance

Key Features

[Model]

20+ AI algorithms for detection & recognition

- Optimized for on-premise, cloud, and edge deployment.

[Speed]

Real-time detection powered by lightweight, optimized models

[Accuracy]

High-precision detection results

Weld Defect Detection Solution for Radiographic Testing (RT)

Digitalization & Automation of Manual Visual Inspection in Non-Destructive Testing (NDT)

→ **Automated detection & interpretation** of weld defect **types / sizes / locations**

Porosity　　　Linear Indication　　　Undercut
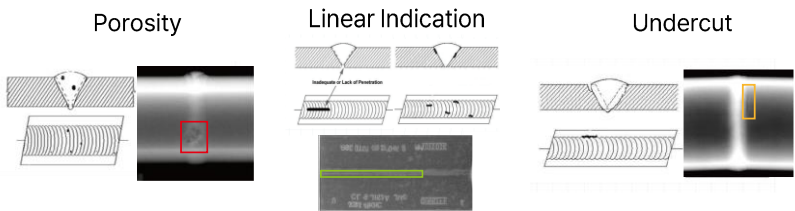
AI defect interpretation based on **ASME and ISO industrial standards**

AS-IS

Manual Film Interpretation by Experts
X-ray Inspection → Film Development → Human Visual Inspection

Inefficiencies
- High inspection cost
- Long interpretation times
- Complex workflow

Heavy Dependence on Highly Skilled, Certified Inspectors
- Labor-intensive process with risk of human error

TO-BE

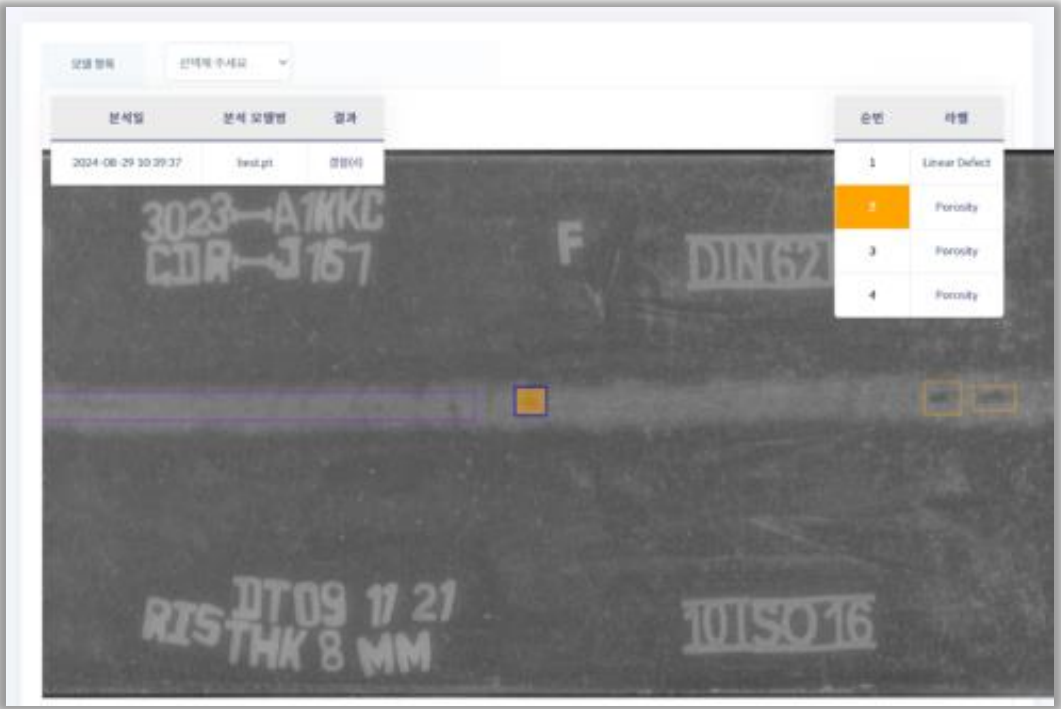**AI Digital Transformation(DX) of Weld Inspection**
Upload film data to server → Vision AI → Auto-interpretation

Significant Reduction in Inspection Time
- Minimizes downtime of industrial facilities

Improved Objectivity & Consistency
- Enhanced inspection reliability and trustworthiness

| Client	AI Tech	Target	Device
Welding Defect Inspection Company	Detection	RT X-ray Film	Cloud

Engine Oil Filter Plate Defect Detection Solution

AI monitoring system for the manufacture process of lower plates in car engine oil filters

Maximizes production efficiency through

automated defect inspection of faulty components

Detects **Discs & Springs** Using **Segmentation AI Models**

- AI models are verified through QC/QA & performance validation

  by process managers and on-site operators.

- Built as a **low-power, lightweight embedded solution** using **NPU**
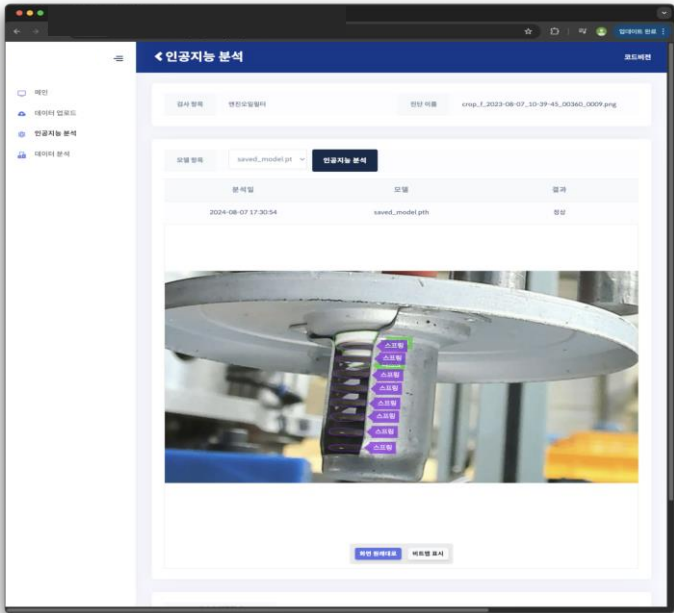
AS-IS	**Traditional Manual Visual Inspection** Prone to variability, labor intensity, and human error
TO-BE	**AI-based Monitoring System** **for Automated Inspection of Defective Parts** **Digital Transformation (DX)** - Improved productivity & operational efficiency - Factory automation **Automatically Classifies 5 Distinct Defect Types in Real Time** - High-quality dataset acquired from real-factory conditions

Good   Bad Disk   Bad Spring

Client	AI Tech	Target	Device
Automotive Parts Manufacturer	Detection	Automotive Parts (Oil Filter Plate)	Cloud Embedded

Solar Panel Defect Detection

Automated Detection & Classification of Damage, Contamination, and Defects

in High-Risk Solar Panels

- AI edge computing for real-time, on-site analysis
- Lightweight CNN-based object detection model
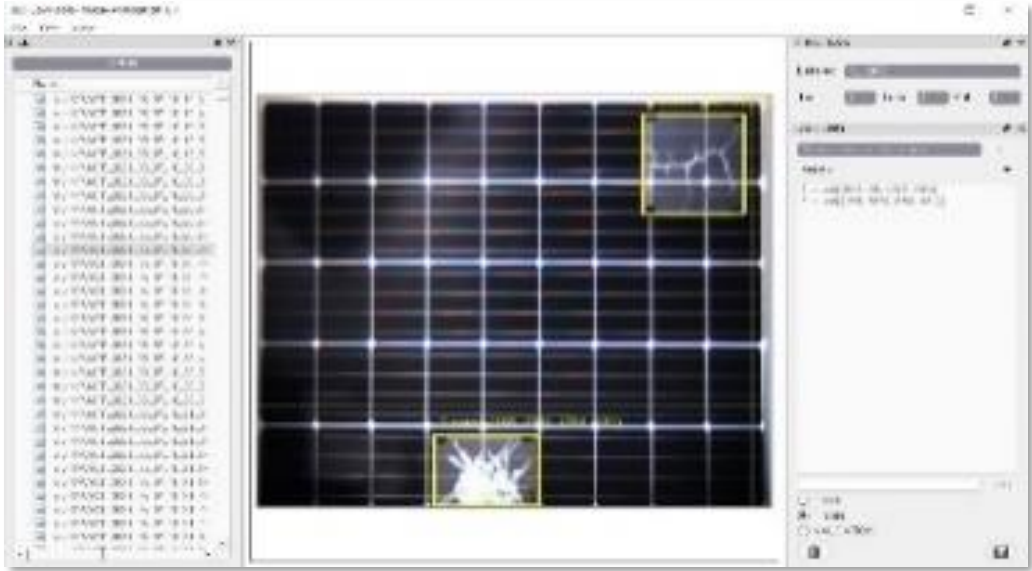
  optimized for embedded systems

Fine-Grained Classification of Defective Cases

[Damage]

- Detects critical defects in frames, glass, and other high-risk components

[Contamination]

- Identifies non-failure contamination such as dirt or residue

  on frames and glass surfaces

| Client	AI Tech	Target	Device
Electronic Technology Development Company	Detection	Solar Panels	Edge On-Premise

Predictive Maintenance Solution

What is Predictive Maintenance?
A **maintenance strategy** that analyzes equipment data to detect **early signs of anomalies** and take **preemptive action before failures occur.**

PHM (Prognostics & Health Management)
- A system designed to enable predictive maintenance through continuous health monitoring and fault prediction.
- PHM supports informed decision-making by predicting the health status and Remaining Useful Life (RUL) of equipment.

Prediction

Normal   Danger
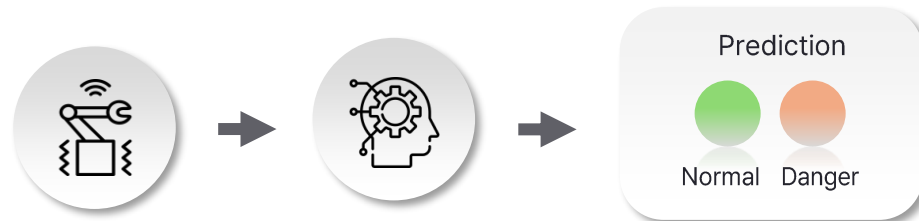
Use Cases
- Smart Factories
- AI-Based Monitoring of Industrial Equipment

Key Features
- Detects & analyzes **abnormal signals** generated by **equipment defects**
- **Predicts failures before they occur**, enabling **significant reduction in maintenance costs**
- Provides optimized solutions for **multi-dimensional signals (vibration, temperature, etc.)**

LNG/LH2 Ship Cargo Tank Monitoring Solution

Integrated Thermal Performance Analysis System and Evaluation Technology
Based on Large-Scale Cloud Computing for High-Efficiency Design and Performance Enhancement
of LNG/LH2 Ship Cargo Tanks in Real-World Operating Conditions

DAQ Manager
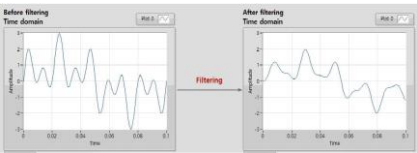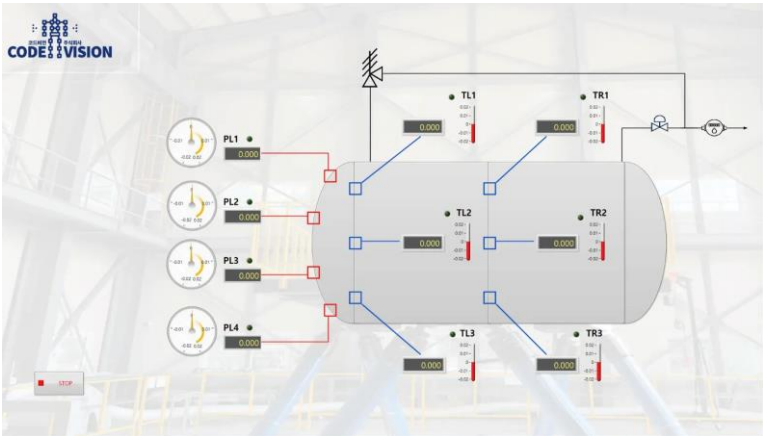
Built-in Data Processing
Functions for Signal Conditioning
: Filtering, Noise Reduction

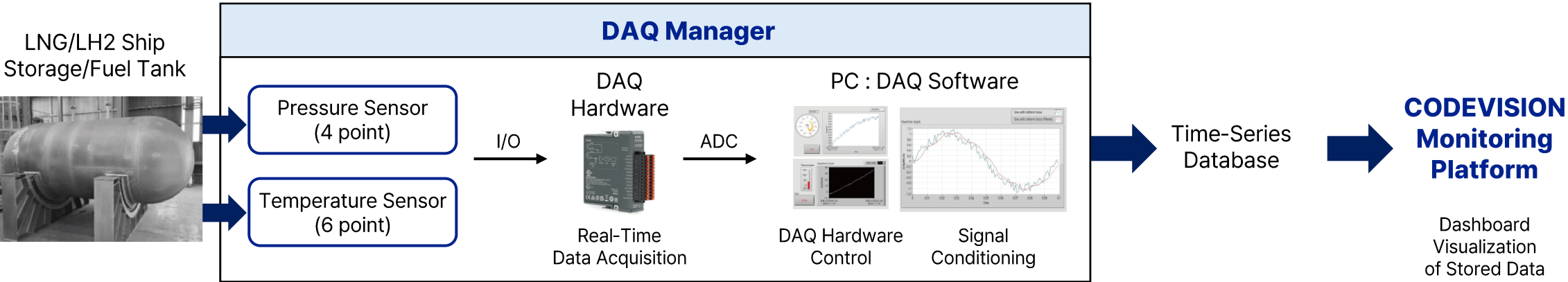RESTful API-based
Time-Series DB Design
: easy scale-out expansion

CODEVISION Monitoring Platform

Web-based GUI
Monitoring Solution

Data Visualize via Dashboard
for Stored Database

System Architecture

LNG/LH2 Ship
Storage/Fuel Tank

DAQ Manager

Pressure Sensor
(4 point)

Temperature Sensor
(6 point)

I/O

DAQ
Hardware

Real-Time
Data Acquisition

ADC

PC : DAQ Software

DAQ Hardware
Control

Signal
Conditioning

Time-Series
Database

**CODEVISION
Monitoring
Platform**

Dashboard
Visualization
of Stored Data

PHM (Prognostics and Health Management) Solution for Motor Operating Valve(MOV)

AI-based PHM System for Motor Operating Valve(MOV)

Monitoring & Diagnosis

- Predicts faults caused by **Overstress, Wear-out**
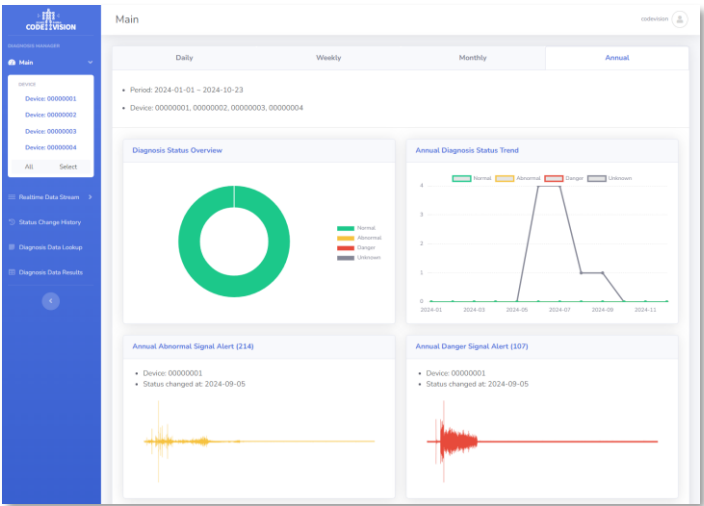
Anomaly Detection Algorithm

- Analyzes distinctive **vibration signals** generated by **defects** in individual components

- Sends alerts when potential failure conditions are detected

Full End-to-End PHM System

: from sensor installation to platform development

Administrator Dashboard

Automated report generation & summarized diagnostic insights

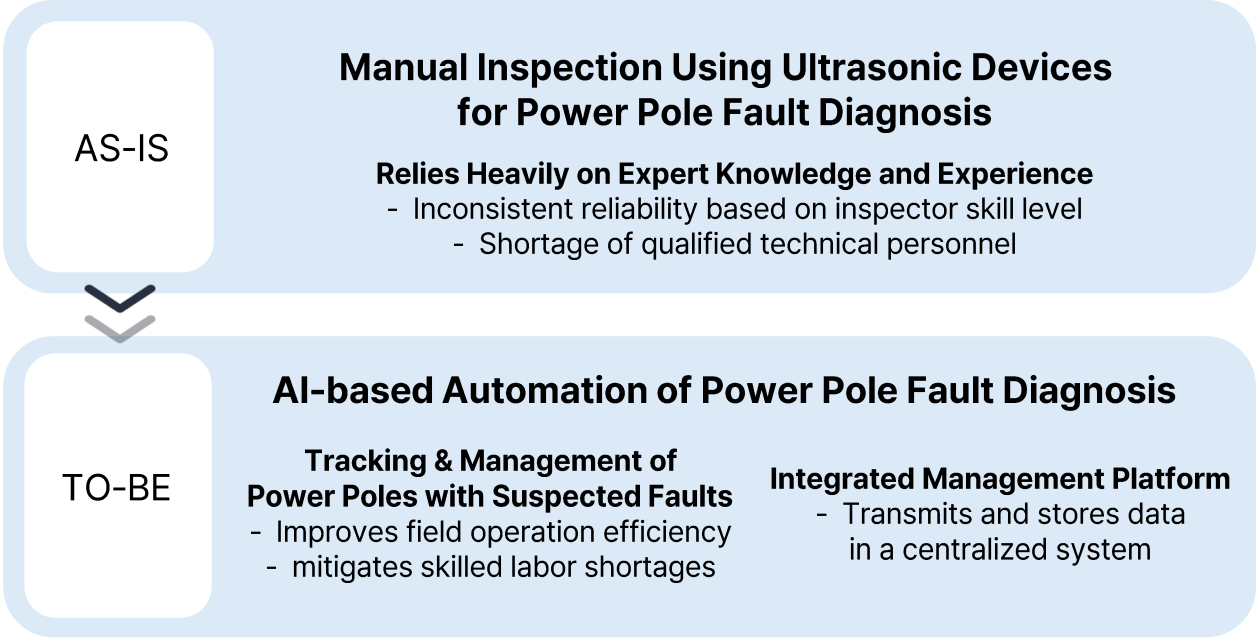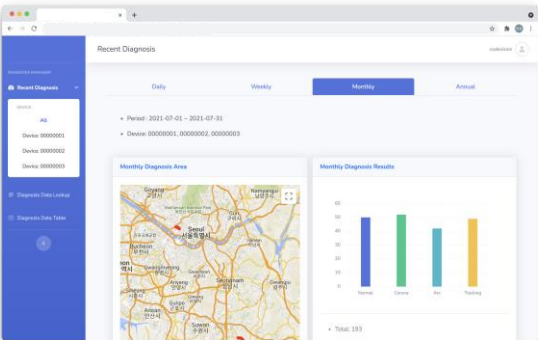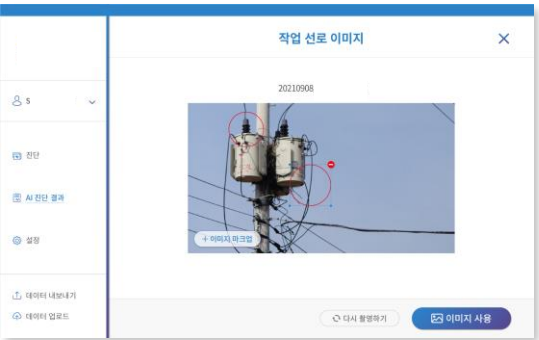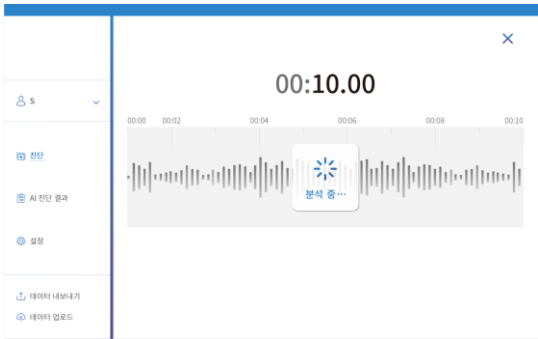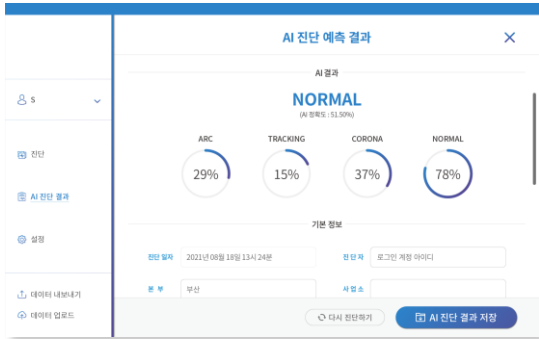| Client	AI Tech	Target	Device
Facilities Operating Industrial Equipment	Predictive Maintenance	Motor Operating Valve (MOV) Vibration Sensor	Cloud On-Premise

Electric Power Equipment Failure Detection

AI-Based Fault Stage Classification for Electric Power Equipment

AI Transformation(AX) of Manual Expert Diagnosis

Mobile Diagnostic App Solution

- **Integrated with ultrasonic diagnostic devices** for on-site power pole inspection

- Real-time AI analysis of **ultrasound** to detect defects and classify fault types

- Available as a **tablet-compatible & on-premise server-based version**

AS-IS

Manual Inspection Using Ultrasonic Devices for Power Pole Fault Diagnosis

Relies Heavily on Expert Knowledge and Experience
- Inconsistent reliability based on inspector skill level
- Shortage of qualified technical personnel

TO-BE

AI-based Automation of Power Pole Fault Diagnosis

Tracking & Management of Power Poles with Suspected Faults
- Improves field operation efficiency
- mitigates skilled labor shortages

Integrated Management Platform
- Transmits and stores data in a centralized system

Client	AI Tech	Target	Device
Power System Company	Predictive Maintenance	Power Pole Ultrasonic Sensor Data	Cloud On-Premise

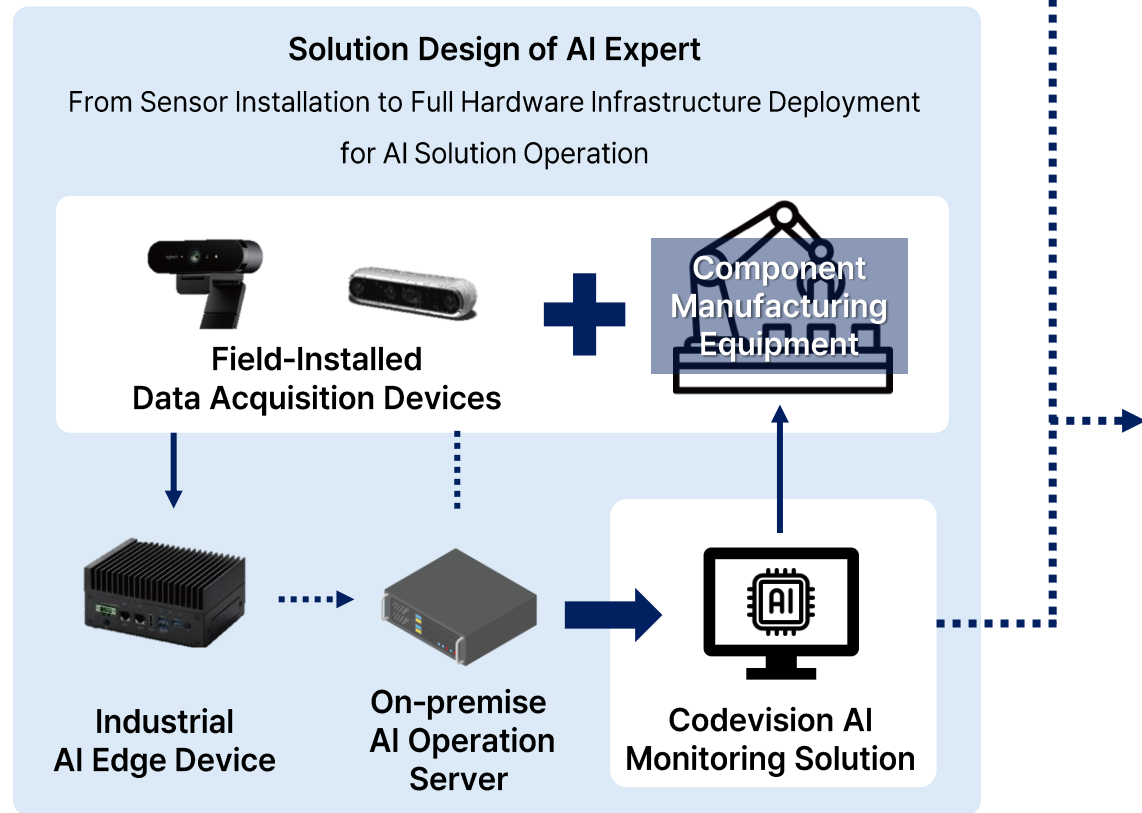# 03. Manufacturing AI Monitoring Solution

Manufacturing AI Monitoring Solution

## AI Transformation (AX) for Smart Manufacturing

Vision AI for Real-Time Detection of Defects in Production Sites and Components

Auto-stops the operation and **notifies** operators upon abnormal events

System Architecture

Solution Design of AI Expert

From Sensor Installation to Full Hardware Infrastructure Deployment

for AI Solution Operation

**Field-Installed
Data Acquisition Devices**

Component Manufacturing Equipment

**Industrial
AI Edge Device**

**On-premise
AI Operation
Server**

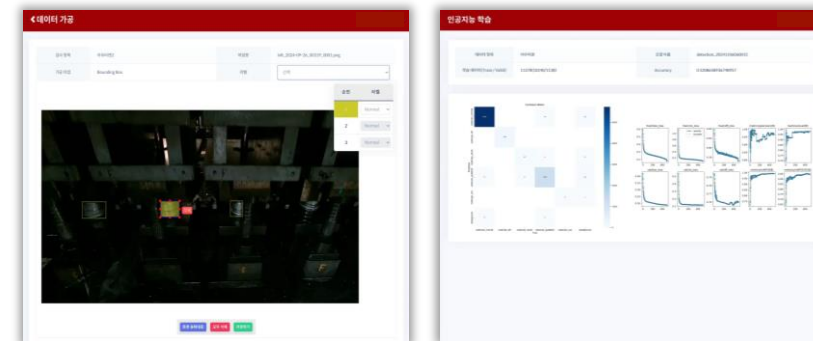**Codevision AI
Monitoring Solution**

Inspector Monitoring Device
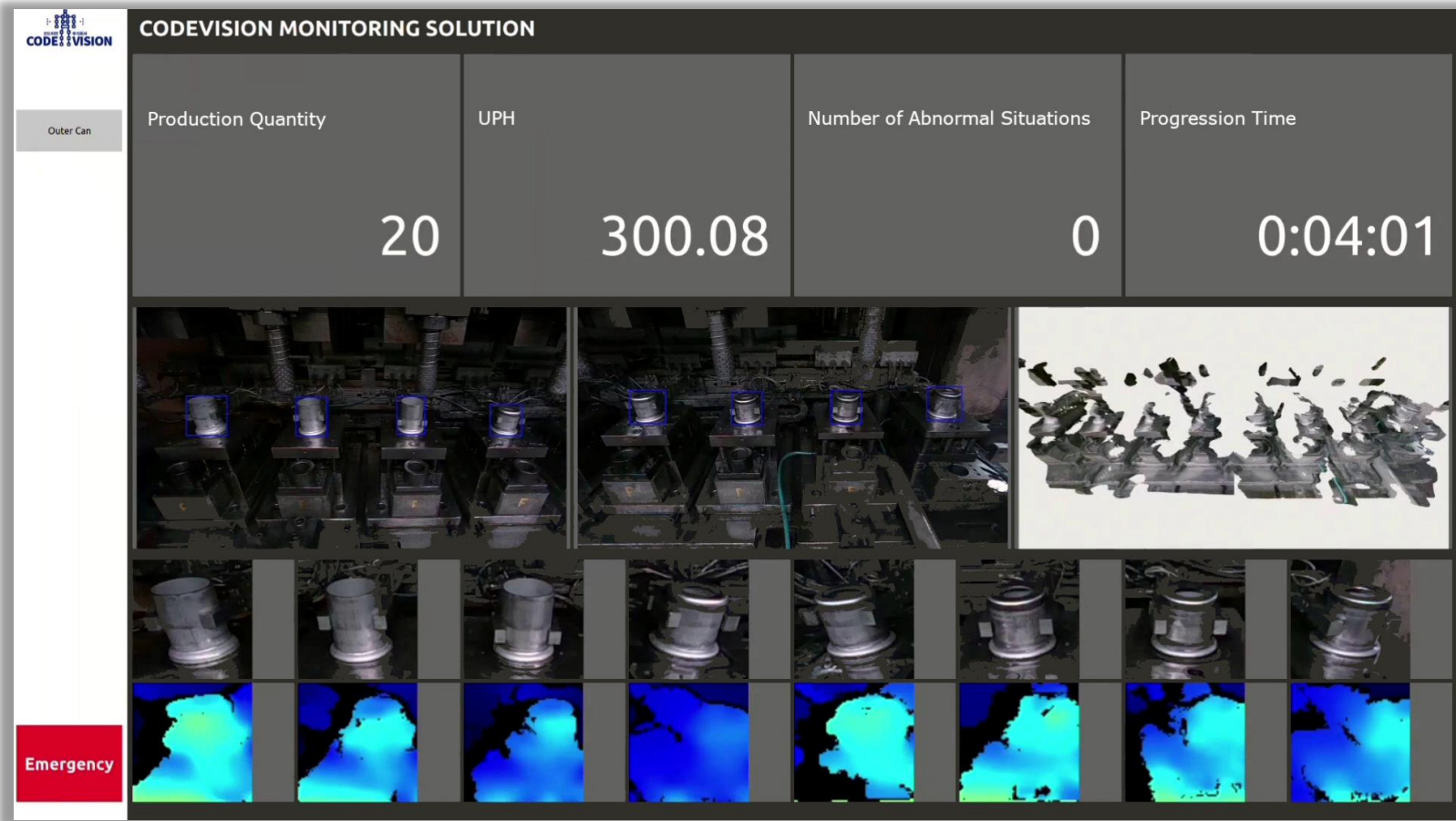
On-Site Real-Time
AI Monitoring Platform
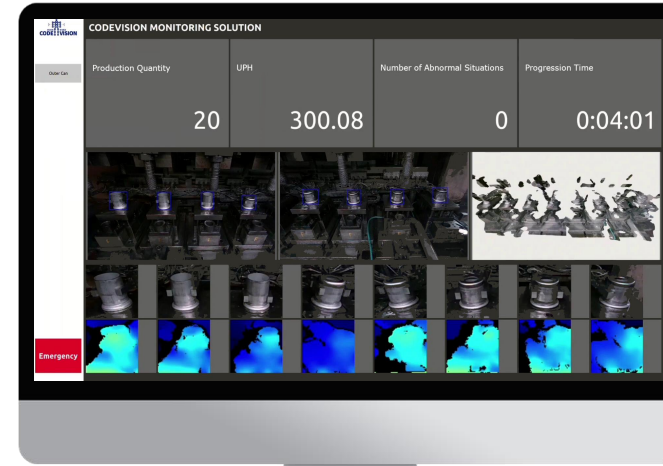
Supervisor PC

AI Model Management
MLOps Platform

On-Site Real-Time AI Monitoring Platform

Real-Time Monitoring

- Real-Time Monitoring of
manufacturing operations

Detect Anomalies

- Automated manufacture process
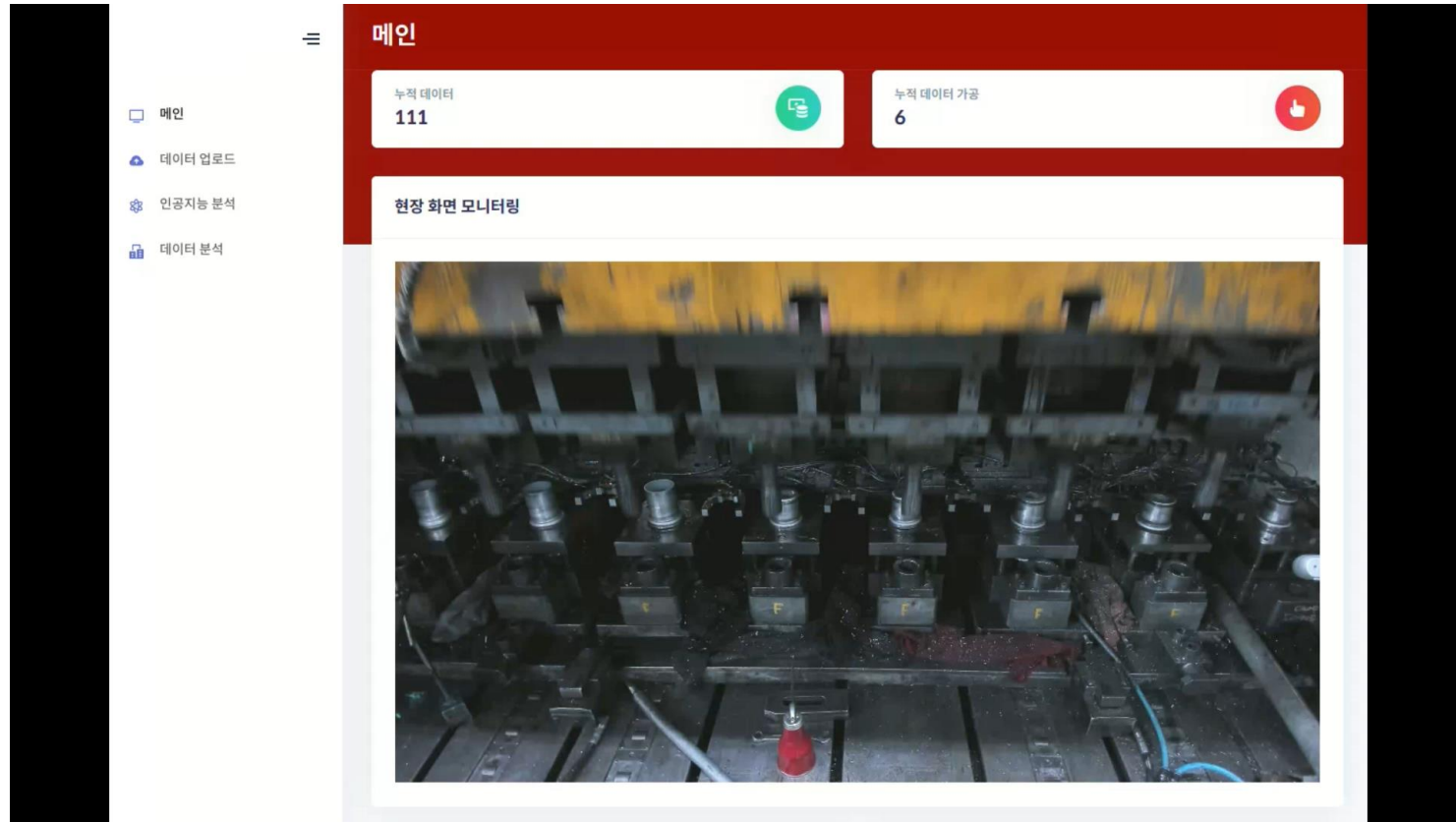monitoring and analysis with AI

Alarm & Auto-Control

- Alarm & Auto-stop
upon anomaly detection
for worker

Reliable AI

- Certification model performance
based on ISO/IEC
- Certification of AI Trustworthiness (CAT)

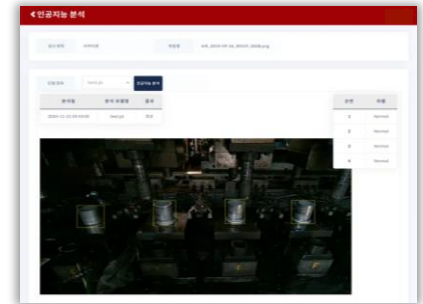# AI Model Management MLOps Platform

AI Model Management Made Simple : Anytime, Anywhere, for Anyone

- **Maintenance solutions** for reliable AI operations

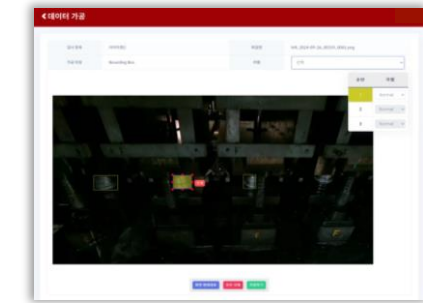- Maintain **high-performance AI services** through continuous **model optimization**

Data Analysis Page

- Management of additional data
collected during
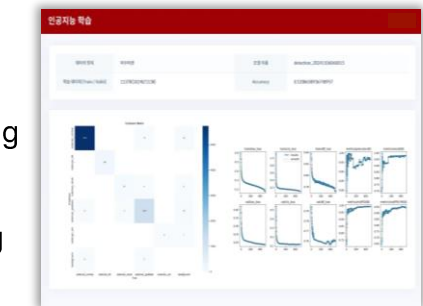on-site operations

Data Labeling Page

- Data labeling for
AI model training available

AI Training Page

- AI model performance monitoring
- Performance enhancement
through continuous AI re-training

Representative Case

Outer Can Metal Molding Process Monitoring

Client **[South Korea]** Automotive Parts Manufacturer

Target Aluminum outer can (EV part)
- Manufacturing method : Deep drawing

AS-IS **Manual visual inspection** by workers at each production stage
- Defective part occurrence → Mold damage → Production line halt

TO-BE **Automation of ejection defect inspection**
Proactive prevention of mold damage → Production downtime is reduced
Productivity improved by over 1.5×
Accurate pre-calculation of delivery volume → Resolved delivery delays
System designed to operate without disrupting existing workflows
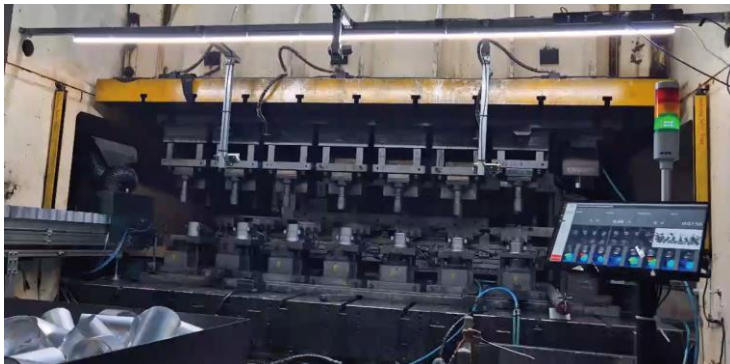
Steel Sheets Defect Monitoring

Client **[Jakarta, Indonesia]** Metal Manufacturing Company

Target Steel sheets cut from hot-rolled coils
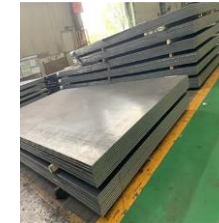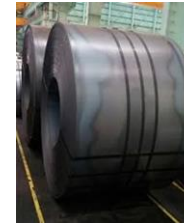
Tech **Vision and laser sensors used to classify steel sheets and monitor coil production defects**
System design optimized for overseas factory environments
- On-site visit for customized consulting & solution development
- Infrastructure tailored to local conditions, including sensors / data acquisition devices / equipment / servers, etc.
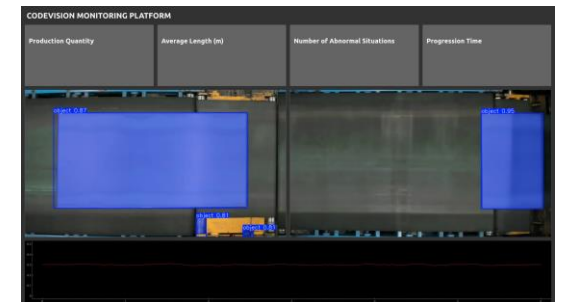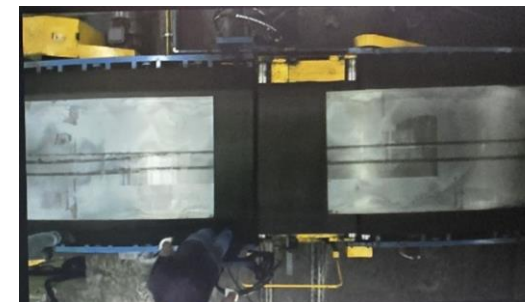
04. Development Case

Medical / Healthcare

Tongue Analysis Solution
for Digital Health Diagnosis

AI Tongue Analysis Solution for Personalized Digital Oral Health Curation

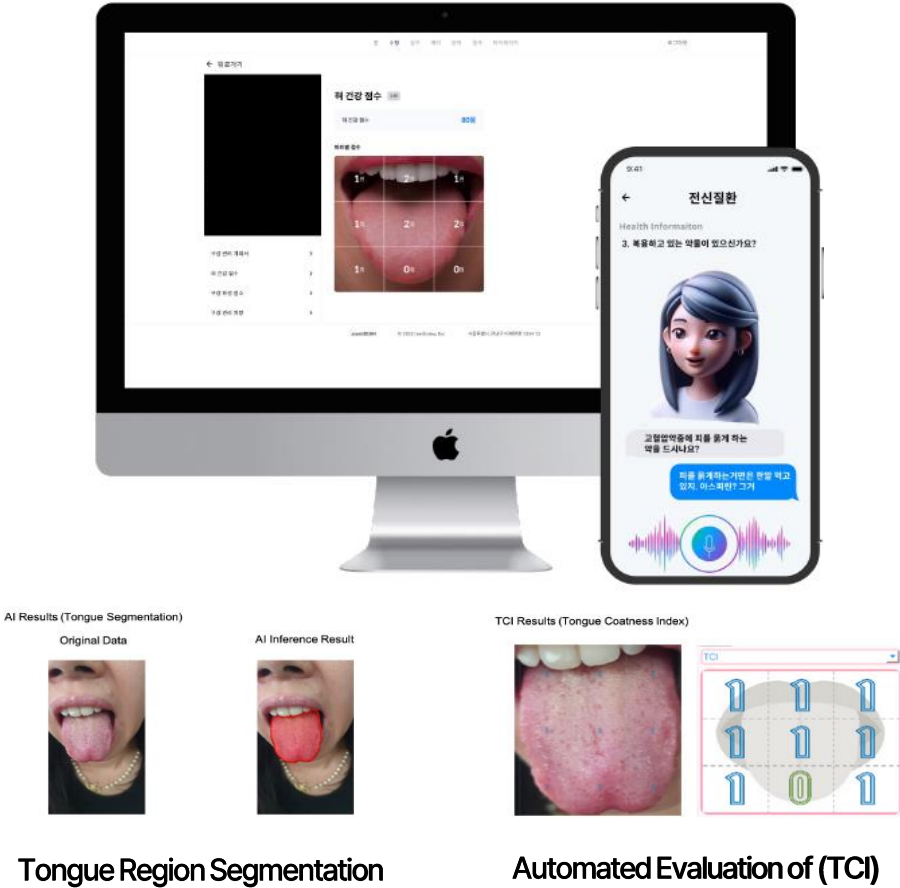| TECH	Tongue Region Segmentation Tongue Coating Index (TCI) Evaluation for bacterial coating analysis Built-in LLM AI Solution with Symptom Inquiry Service

AI Tongue Health Analysis

- **Automatically analyzes tongue images** using segmentation &

  TCI classification AI models

- Enables integrated diagnosis by combining AI results & clinician evaluations

- Validated in collaboration with **dental clinics as a clinical testbed**

15,000 Tongue Images Processed Based on Expert Oral Health Criteria

- Custom data processing platform developed for original **TCI labeling**

AI Results (Tongue Segmentation)

Original Data   AI Inference Result

TCI Results (Tongue Coatness Index)

Tongue Region Segmentation   Automated Evaluation of (TCI)

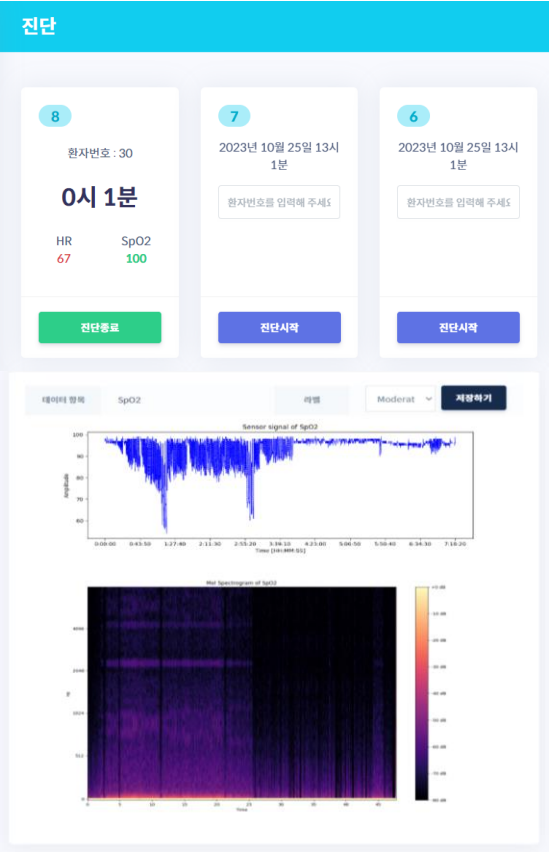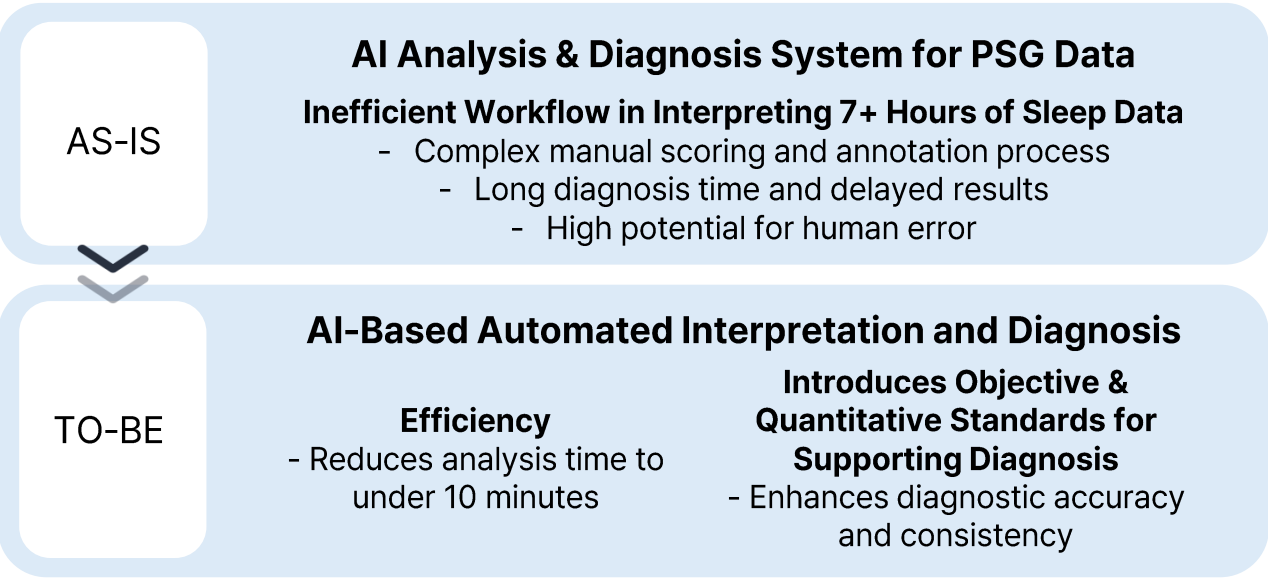| Client	AI Tech	Target	Device
Digital Dentistry Service Company	Detection Diagnosis	Tongue Coating	Cloud On-Premise

Medical / Healthcare

Polysomnography(PSG) Analysis & Diagnosis Assistant

Diagnoses to Severe Sleep Apnea Using
Oxygen Saturation(SpO2) & Electrocardiogram(ECG) Sensor Data

Enables early screening of sleep apnea patients in ICU and Stroke Units (SU)

Deployable on mobile and wearable devices

Trusted & Validated AI

- **Co-developed with neurologists** and validated through testing by hospital medical staff

- **Sensor data using actual FDA-certified medical equipment**
 : Collected **1,750** Medical Data Records

AS-IS

AI Analysis & Diagnosis System for PSG Data

Inefficient Workflow in Interpreting 7+ Hours of Sleep Data
- Complex manual scoring and annotation process
- Long diagnosis time and delayed results
- High potential for human error

TO-BE

AI-Based Automated Interpretation and Diagnosis

Efficiency
- Reduces analysis time to under 10 minutes

Introduces Objective & Quantitative Standards for Supporting Diagnosis
- Enhances diagnostic accuracy and consistency

Client	AI Tech	Target	Device
Neurology Department at Hospital	Diagnosis	PSG Data	Cloud

Mobility

Car Crash Test Evaluation and Dummy Analysis
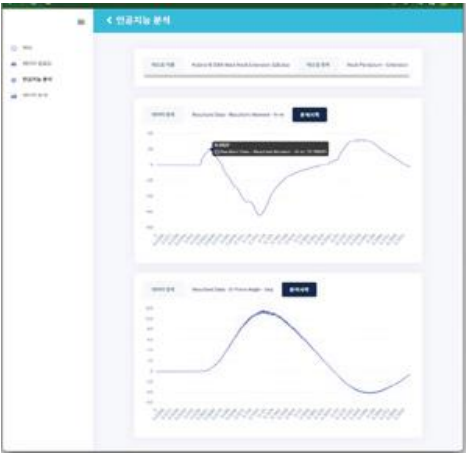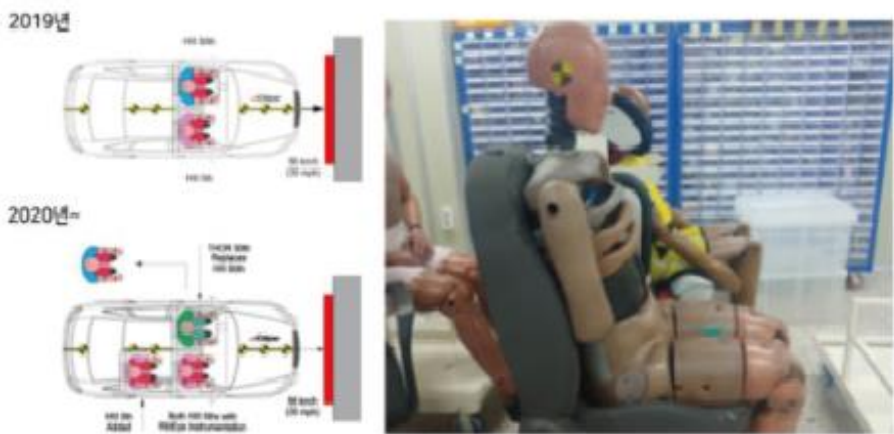
Mobility Occupant Recognition and Indoor Analysis
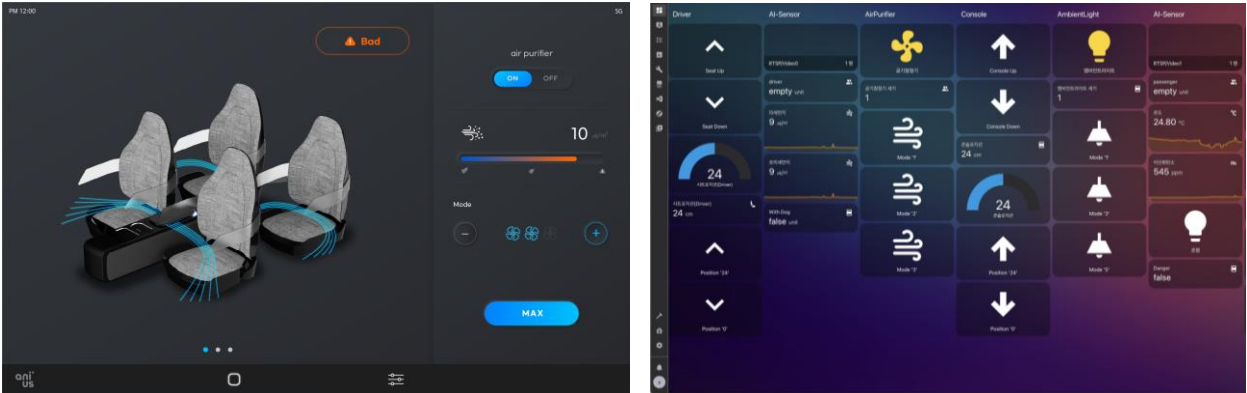
In-Vehicle Human & Pet Behavior Recognition

Skeleton-Based Pose Estimation

CODE VISION

Ecology / Environment

Underwater Monitoring and Red-Green Algae Prediction Using Marine Robots
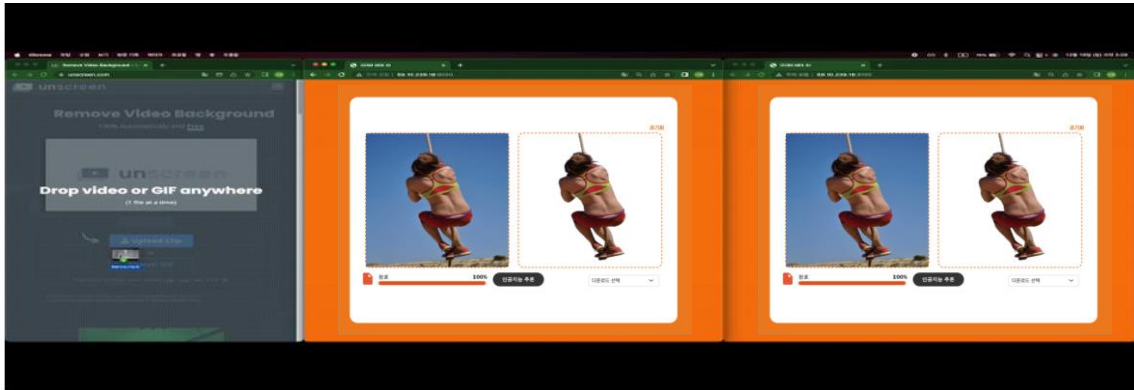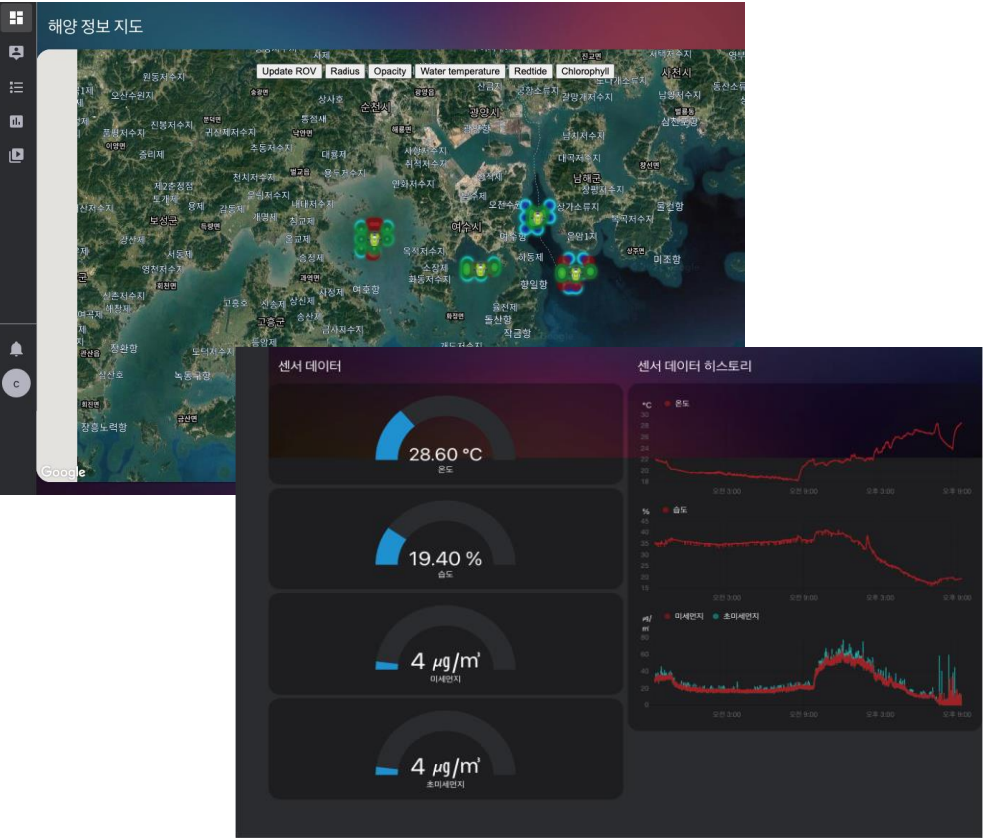

Digital Lifestyle

Video Background Removal Solution

AI SaaS Video Editing Solution

- Seamless background removal

- Accurate object recognition

Optimized AI Models with Distributed Processing

- **Over 50% faster than competitors**

Global Competitor (Unscreen)

Processing Time : **37m**

CoVi Tool Single Process

Processing Time : **22m**

CoVi Tool Multi Process

Processing Time : **13m**

CONTACT

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