Advanced technical assistance of operation for sewage treatment plant by AI

Project Contractor
Consortium between Meidensha Corporation, NJS Co., Ltd., the City of Hiroshima, and Funabashi City
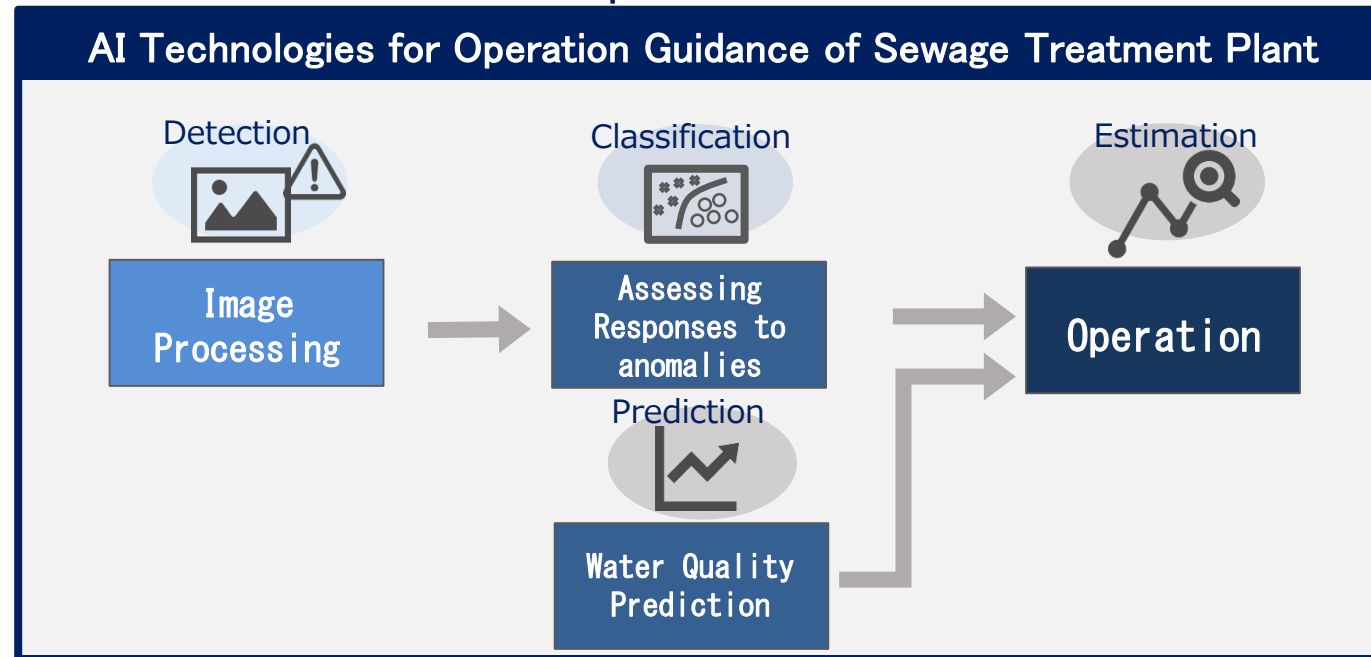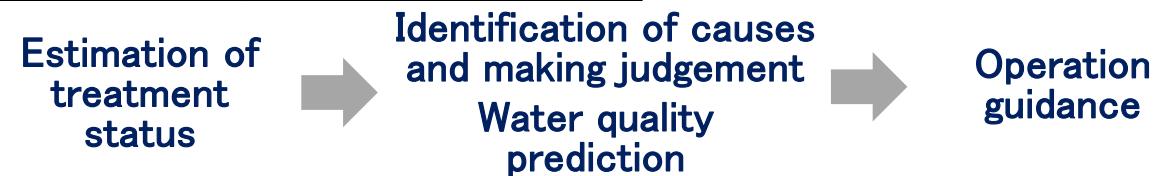
Demonstration Field
Seibu Water Resources Reclamation Center, Takase Sewage Treatment Plant

Demonstration Overview
Demonstrate the stability of treated water quality and reduction of operating cost using AI technologies of image processing, assessing responses to anomalies, and so on, in order to inherit the know-how of skilled engineers and realize the optimization and effectiveness of the operation for sewage treatment plant.

Overview of Proposed Technology

Estimation of treatment status → Identification of causes and making judgement / Water quality prediction → Operation guidance

AI Technologies for Operation Guidance of Sewage Treatment Plant

Detection — Image Processing → Classification — Assessing Responses to anomalies / Prediction — Water Quality Prediction → Estimation — Operation

Input: Control Device, Camera Image, Daily Report, Water Quality Analysis — Operation data

Output: Operation Guidance
- Estimation of treatment status
- Predicted water quality
- Cause and response
- Operational variables

Innovative Features
The four AIs work together to provide operation guidance and realize technology inheritance by visualizing the basis for judgment and advanced support that aims to maintain or reduce costs.

(1) AI Image Processing
Grasp the situation of final clarifier and detect anomalies using camera images as a substitution of the skilled engineers.

(2) AI Assessing Responses to anomalies
Visualize the relationship between the cause and the response from the water quality and images, and identify the measures.

(3) AI Operation
Estimate the optimum operation amount from the numerical data.

(4) AI Water Quality Prediction
Predict the treated water quality for the current and estimated operational variables.