



Where software concepts come alive™

Business Domain

GIS and Geospatial,
Environmental

Project Type

CLI tool, shared library

Automated Drone Image Processing Reduced Manual Work by 70% for a US-based Environmental Monitoring Company

Client

The Client is a tech advanced data collection and monitoring company specializing in GIS database solutions for large-scale projects. They offer geospatial development, biological monitoring, environmental studies, and restoration plan development.

Project

Developing an advanced tool to automatically extract key features like tanks, separators, buildings, and containment structures from drone images.

Objective

The Client requires a strategic and technical solution to streamline and cut costs in processing drone imagery for construction site monitoring. This involves automating feature extraction from environmental data to boost efficiency.

Team Reinforcement

The Client lacked machine learning expertise necessary for implementing the automation tool within their data processing workflows. Utilizing the Time & Material (TM) model, Intetics developed a customized solution from scratch applying the unique ML expertise in the geospatial field and tailoring the development approaches to seamlessly integrate with the Client's data.

Challenge

Developing a powerful automated solution for extracting features requires seamless integration with Windows and ArcGIS Pro. It should offer a user-friendly process for extracting features into the Client's data model, using shapefiles to streamline data transformation and loading.

The Client was looking to automate their processing workflows to improve data accuracy and consistency while reducing human errors associated with manual processing.

The Client sought a seasoned machine learning solution provider. Intetics conducted a thorough analysis of the Client's system, offering a strategic overview of development. Leveraging expertise in ML techniques, Intetics navigated complexities and crafted innovative solutions to drive the project forward.

Quick Facts

- ✓ 95% of detection accuracy
- ✓ The automated processing resulted in a 35% cost saving compared to manual processing
- ✓ Ongoing cooperation to extending the functionality of the developed solution

Technologies

Python / PyTorch / Rasterio / OpenCV / GeoPandas / ONNX

Solution

★ 01

The ML-powered solution enabled the Client to automate processing tasks, conduct advanced environmental analysis, and enhance data security while mitigating compliance risks.

★ 02

Robust feature detection, simple integration into proprietary software, possibility of standalone execution, flexible configuration, easy tuning pipeline, modern technologies and frameworks.

★ 03

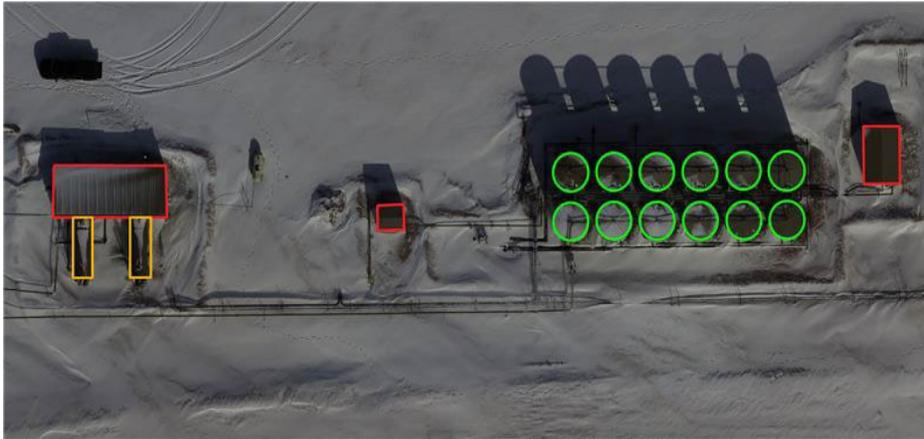
Designed to adapt to evolving environmental data and challenges, the solution utilizes advanced machine learning algorithms to offer actionable insights, analytics, and monitoring.

★ 04

An innovative object detection solution, utilizing deep learning with PyTorch, ONNX, GeoPandas, and Open3D, achieved high-quality results with minimal resources, ideal for precision-critical tasks.

★ 05

The project succeeded by merging Point Clouds and Rasterized Orthophotos. Converting 3D point cloud data into a 2D heightmap via rasterization combined the strengths of both data types, resulting in a more detailed and precise environmental representation for enhanced object detection.



Benefits and Results

- ★ The Client received a fully customized solution developed from scratch, utilizing state-of-the-art data science technologies and techniques.
- ★ By implementing the solution, manual work is decreased by 70%, eliminating a substantial number of human errors and cutting significant costs on operational staff.
- ★ The performance of the developed algorithms exceeds the assumed accuracy percentage, reaching 95%.
- ★ The first feasible results ready to be implemented into production have been reached within 2 months of cooperation between the Client and Intetics.