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### **Business Domain**

GIS and Geospatial

### **Project Type**

Data Collection automation platform

# Precision Mapping of Utility Networks Across Ontario

## **Client**

A leading Canadian multidisciplinary firm specializing in engineering, surveying, and geospatial services. The company is known for its expertise in infrastructure design, utility mapping, and project management, serving a wide range of public and private sector clients across North America.

## **Project**

Processing and developing a comprehensive solution for extracting vector data from mobile LiDAR and panoramic 360° images, ensuring precise identification and classification of 50 feature types essential for utility management.

## **Objective**

Enhance the overall efficiency and adaptability of data processing systems to leverage the latest technological advancements for comprehensive spatial analysis.

- Implement advanced technologies to streamline LiDAR and panoramic data processing.
- Produce accurate and high-quality vector data for various industry applications.
- Develop automated algorithms to expedite attribute calculation and reduce delivery time in urban planning.

## **Team Reinforcement**

Within a span of two months, a team of over 60 GIS engineers, specialized in LiDAR processing automation and algorithm development, was carefully assembled to optimize workflow and adapt to new technologies.

# Challenge

The Client is a diverse company offering utility engineering, GIS data management services, and subsurface utility engineering. One of the Client’s project lines is Powerline management and inspection.

There were several challenges for this project:

- Handling numerous attributes for each feature (heights, types, position, etc.);
- Rapidly extracting vast quantities of features from large datasets;
- Automating processes to minimize time and maximize data throughput.

The client required enhanced capabilities in automation, scalable technologies, and advanced data processing to efficiently manage complex geospatial datasets.

## Quick Facts

- ✓ Processed over 7,000 km of road networks and extracted over 15 million features categorized into 50 distinct types
- ✓ Developed ML approach for data classification decreased the manual processing time by 60%
- ✓ Made first delivery within 2-week timeframe, achieving rapid deployment and results
- ✓ Highly detailed surface and terrain models enabled precise calculation of spatial attributes

### Technologies

PostGIS / GlobalMapper / TerraSolid / Python

# Solution

## ★ 01

The comprehensive dataset served as the foundation for decision-making on the maintenance and development of fiber-optical networks across Ontario region.

## ★ 02

This project is part of the state program for developing fiber-optical networks in the region and aims to ensure service accessibility for more than 18,600 households.

## ★ 03

Intetics engineers integrated GPS data with images via a custom script, speeding up workflows and enabling higher data delivery and project capacity.

## ★ 04

Automatic tree classification expedited extraction, but calculating additional attributes like trunk width and canopy width without specialized software complicated the process. To address this, several scripts were developed to fully automate these calculations.

## ★ 05

After a thorough inspection of all available sources, the Team created a catalog of examples to help identify all features expected in the project and now it can be used in similar Utilities projects.



## Client Reference



*The services provided by Intetics met our expectations in terms of both quality and efficiency. The team demonstrated flexibility by adapting their data processing workflows to align with our requirements, which resulted in a 60% reduction in manual processing time.*

**Head of Data Processing Department**

## Benefits and Results

- ★ Delivered actionable data sets that significantly improved the client's understanding of their utility infrastructure.
- ★ Processed and extracted over 15 million features across 50 categories with high precision, completing the project within the planned timeframe.
- ★ Developed a scalable feature extraction framework that can be adapted for similar large-scale projects.
- ★ Enabled predictive maintenance and planning through the integration of detailed terrain and surface models with utility features.