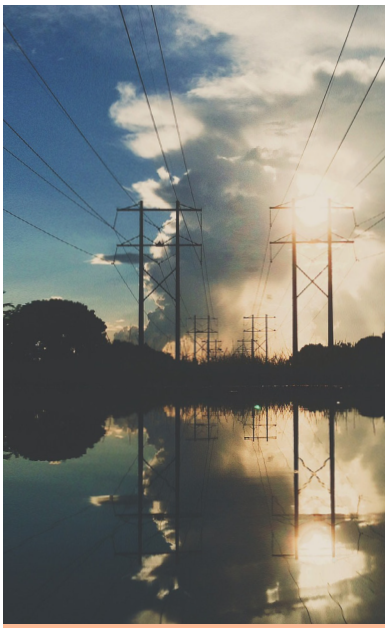
intetics
The Remote In-Sourcing® Company



"We had all this data and Intetics team created an efficient solution in a very short period of time that allowed us to use it in a meaningful way. It helped us improve our maintenance process tremendously."

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INTETICS ENABLES FASTER AND SAFER POWER LINE INSPECTIONS WITH LIDAR DATA ANALYSIS

OBJECTIVE

In the shortest time possible enable an energy and power company to conduct power line maintenance using LiDAR data.

CHALLENGE

Power lines require regular maintenance to ensure all structural elements are supported. This requires systematic servicing of power line components such as transmission lines and tangent towers among other things. These inspections include complex procedures designed to prevent premature degradation and destruction of power line parts. Furthermore, the company must ensure quality and timeliness of inspections to guarantee power line safety during servicing. To assess the condition of power lines and decide which lines need maintenance, the client chose to conduct a LiDAR survey using UAV. This was the quickest and cheapest option, compared to conducting a similar airborne LiDAR survey. The one drawback of this approach is that the UAV with LiDAR on board provides raw data. Therefore it requires specific, expensive software to process, highly qualified specialists and expertise in cloud of point analysis, 3D analysis, and GIS. Not having such expertise in-house, the energy company was looking for GIS specialists with LiDAR data analysis expertise to successfully use their survey data.

SOLUTION

The power company turned to Intetics, which has over 5 years of experience in remote data processing and specifically in LiDAR data analysis. Additionally, Intetics teams showed ability to make important improvements to the process to speed up the fulfilment of the plan and increase quality of results.

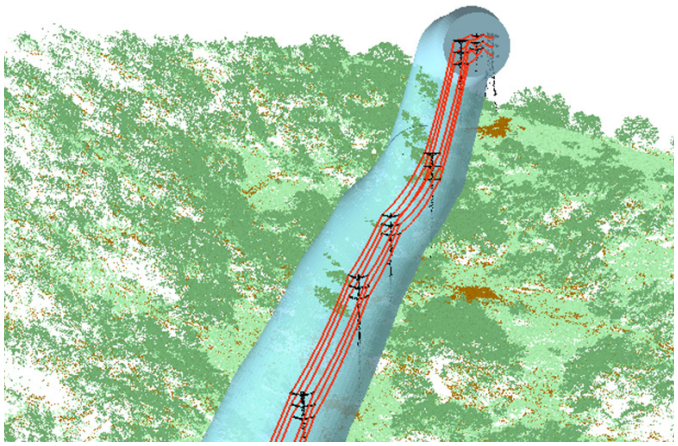
LiDAR data (cloud of points) becomes widespread in a terrain survey. The data needed to be organized, cleaned, analyzed and interpreted. Intetics team processed data and employed data analysis algorithms to achieve a power line analysis with appropriate quality and within the time limit. To obtain the defined results, it was necessary to create specific methods and processes that fit the data and goals. The completion of the task was accomplished by employing the following processes:

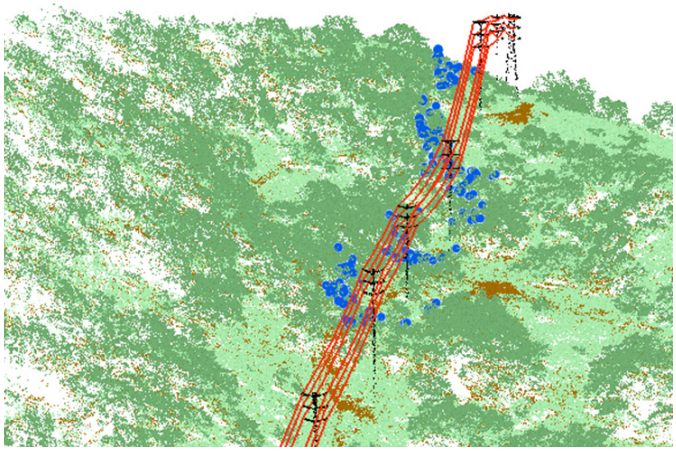
1. Data joining;
2. Exclusion of redundant points;
3. Last return analysis – separation of bare earth from cloud of points;
4. Semiautomatic process of vegetation detection;
5. Semiautomatic process of anthropogenic objects detection;
6. Manual process of power line detection.
7. 2D digitization of transmission lines, height expansion;

THE CLIENT COULD FOCUS ON MAINTENANCE SOONER AND IMPROVE THEIR PERFORMANCE FASTER

8. 3D modelling of tangent towers;
9. 3D analysis process including 3D buffer, spatial selection;
10. Interpretation of received data.

Every aspect of the provided solution was completely customized. The solution used the provided LiDAR data in full, and can be independently used to conduct necessary activities in the field.





RESULTS

After working with Intetics, the energy company obtained a solution that helped them assess the condition of their power lines and ensure safety during maintenance. The result included a range of useful information and analysis for the client including:

- Objects in terrain that limit the acceptable width of the power lines;
- Objects in terrain that would threaten to damage the power lines;
- Objects in terrain that are an unacceptable distance from transmission lines and tangent towers;
- Parts of transmission lines that are an unacceptable distance from ground surfaces;
- Parts of transmission lines that are an unacceptable distance from building surfaces;
- Tangent towers that have misalignments.

Additionally, the client received a 3D model of the powerline to use in further investigations.

Relying on Intetics experience and efficient process implementation, the client's operations benefited from high quality data analysis. Moreover, the swift organization of the team allowed data analysis process implementation in the shortest time possible, which allowed the client to focus on maintenance sooner and improve their performance faster.

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