

## Point Cloud Processing Software for Power Line Inspection & Analysis

LiPowerline offers an intuitive and highly efficient solution for power line inspection from LiDAR point clouds. This software includes powerful tools for the automatic and manual classifying of power lines, transmission towers, vegetation, buildings, and other objects of interest. The program can be used to automate the detection of userdefined danger points (e.g., vegetation encroachment and tree fall hazards). Built-in reporting functions allow users to quickly generate detailed project reports and results can be exported as KML formatted files.

When carrying out detailed transmission tower inspections with drones, operators can define a flight plans that consider transmission tower designs based on previously collected point cloud data. The point cloud data is used to develop pre-planning flight routes that target the main components of the tower during high-resolution image capture.

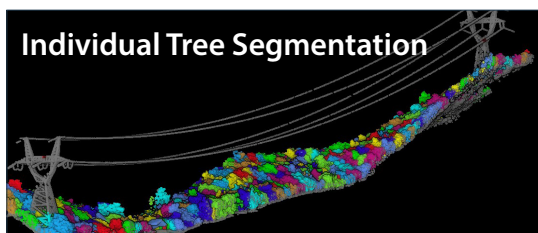
### Software Features :

#### — Advanced Classification Tools

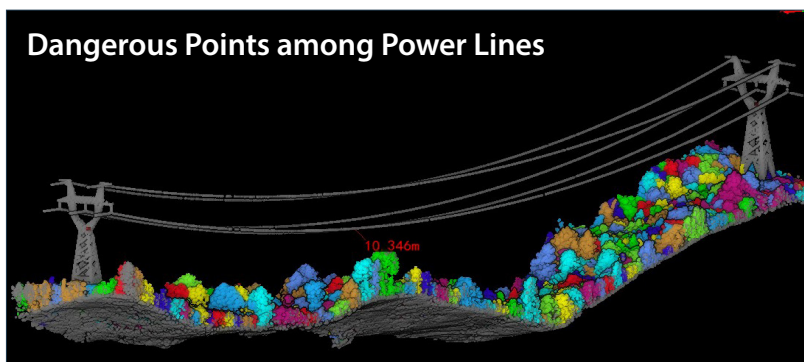
- Deep learning tools that automate the classification of the transmission tower and conductors in point cloud data
- Automated ground and noise point classification routines
- 2D and 3D profile editing tools to assist users during point cloud classification

#### — Real-Time Working Conditions Analysis

- Individual tree segmentation by span/section
- Extract danger points along power lines
- Detect individual tree information such as location, height, crown size, etc.

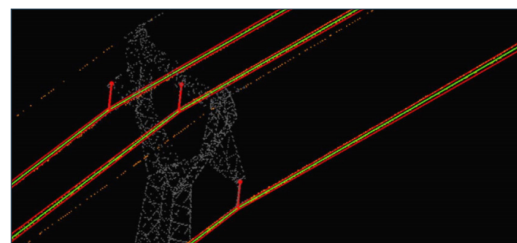


TreeHeight	CrownDiameter	CrownArea
4.478	4.568	16.389
6.292	3.441	9.297
3.999	3.935	12.158
7.259	11.52	104.223



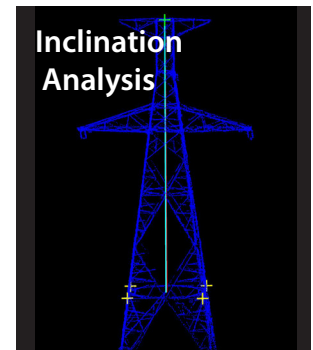
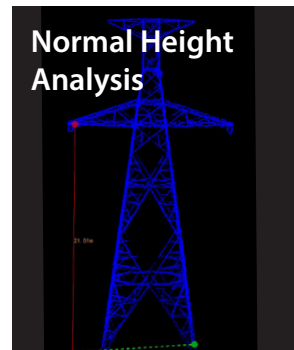
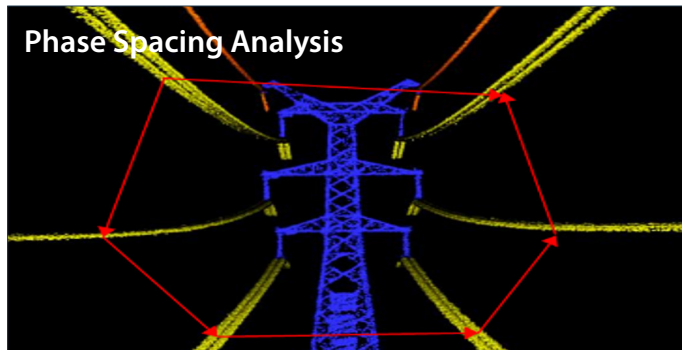
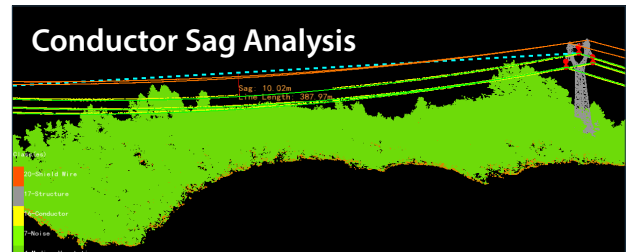
#### — Simulate & Predict Environmental Variabilities

- Semi-automated tools for vectorizing insulators, power lines and transmission towers
- Simulate influences of tree fall, expected individual tree growth, wind, ice-loading, and air temperature on conductor sag and sway under user-defined environmental conditions



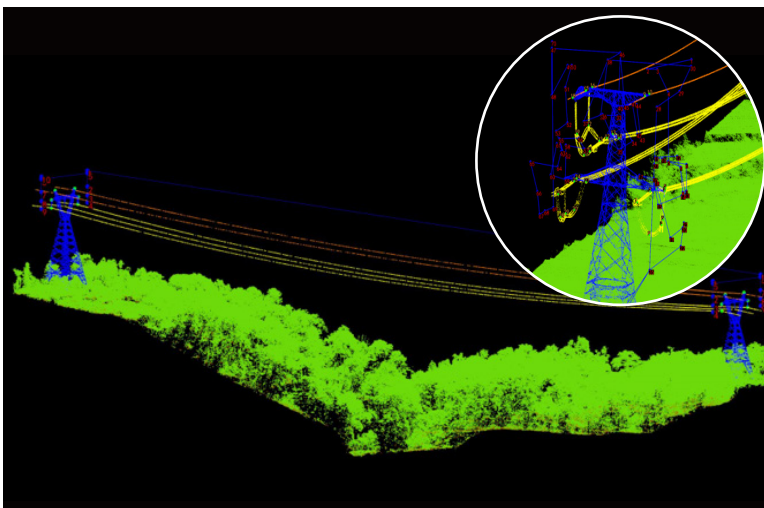
## — Inspections Based on LiDAR Data

- LiPowerline has been developed to with the goal of extracting the information on corridor/right-of-way as well as asset (e.g. conductors and transmission towers) from LiDAR data. This information can then be used in subsequent analyses including those that examine phase-spacing, normal height and inclination conditions, as well as the impacts of different environmental conditions on conductor sag.



## — Detailed Transmission Tower Inspections

- Detailed transmission tower inspections support capturing a large set of high-resolution images of the main components of the tower, and typical issues that analysts identify using drone-based imagery include structural issues, missing and backed-out cotter pins, cracked insulators, vegetation concerns and so on.
- In short, you can use our system to identify hard-to-find maintenance issues—before they degrade performance or cause a critical failure.
- Moreover, LiPowerline contains functions that allow users to plan efficient transmission tower inspection flight routes. These flight plans can then be imported into the ground control software. These flight route planning functions can significantly reduce the cost of inspections by improving data collection efficiency. Users can also simulate the flight in the point cloud data before heading to the field in order to determine if the proposed route is safe or not to fly.



Flight Route Planning Tools



Detailed Inspection Views