

Utility Inspection Transmission Tower Powerline

C O N T E N T

- 01. Products
- 02. Transmission Tower & Powerline Inspection Solutions
- 03. Project Examples
- 04. Why GVI

Are Transmission Towers and Powerlines being Inspected as Often as Needed?

Almost anywhere in the world, you can step outside and see power lines, but how safe are those lines? Are they thoroughly checked often enough? As the world's electrical needs increase so does the number of power lines required to meet those needs. **In the United States alone**, there are **more than 5.5 million miles** of local distributions lines and **more than 200,000 miles** of high-voltage transmission lines, according to Scientific America.

Dangers of Unchecked Transmission Tower and Power Lines

e.g. A downed powerline in Colington Harbor on fire Thursday.

September 7, 2019

Video: Treat all downed power lines like they are energized

September 7, 2019 OBX Today Featured 0



A downed power line in Colington Harbour on fire Thursday. [Mike "Moose" Smith photo]

Local power companies are stressing the importance of everyone staying away from any downed power lines and treat them like they are still energized.



In many areas, the problem is exacerbated because utilities' distribution and sub-transmission lines often traverse vast stretches of unpopulated or remote areas. Without sensors on those lines or crews in the field, impending equipment failures are rarely visible to electric utilities until failures occur, sparks fly, and flames begin.

Source:

<https://www.tdworld.com/vegetation-management/article/20971445/pge-responds-to-latest-cal-fire-announcement-on-cause-of-october-fires>

<https://www.utilityproducts.com/transmission-distribution/article/14075071/aclara-points-to-role-of-smart-grid-line-sensors-and-analytics-in-helping-electric-utilities-mitigate-wildfire-risks>

Dangers of Unchecked Transmission Tower and Power Lines

e.g. Trees or parts of trees falling on power lines as specific causes of the various named fires



VEGETATION MANAGEMENT

PG&E Responds to Latest CAL FIRE Announcement on Cause of October Fires

The release stated that 12 Northern California wildfires in the October 2017 Fire Siege were caused by electric power and distribution lines

Jul 10, 2018

Hazardous Weather Leads to Power Outages



In many areas, the problem is exacerbated because utilities' distribution and sub-transmission lines often traverse vast stretches of unpopulated or remote areas. Without sensors on those lines or crews in the field, impending equipment failures are rarely visible to electric utilities until failures occur, sparks fly, and flames begin.

Hazardous Weather Leads to Power Outages

e.g. Icy Conditions

Icy conditions lead to scattered power outages; hazardous weather expected to continue

[Deneen Smith](#) Feb 6, 2019

SALE! Subscribe for \$1/mo.

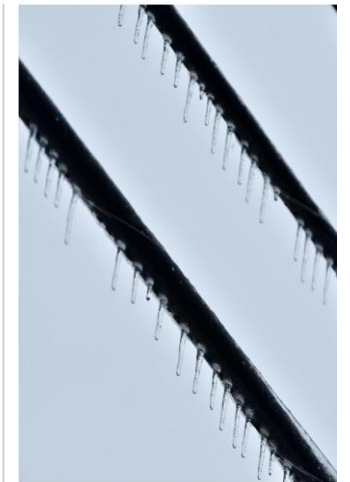
1 of 5



A We Energies crew works on power lines in the 7300 block of 236th Avenue in Paddock Lake on Wednesday.

ICE ENERGY

KENOSHA NEWS PHOTO BY SEAN KRAJACIC



Power lines are weighted down with a layer of ice on Wednesday, Feb. 6, 2019.

KENOSHA NEWS PHOTO BY SEAN KRAJACIC

Source:

<https://www.wbur.org/news/2018/03/09/residents-still-without-power-noreaster>

Part ONE



PRODUCTS

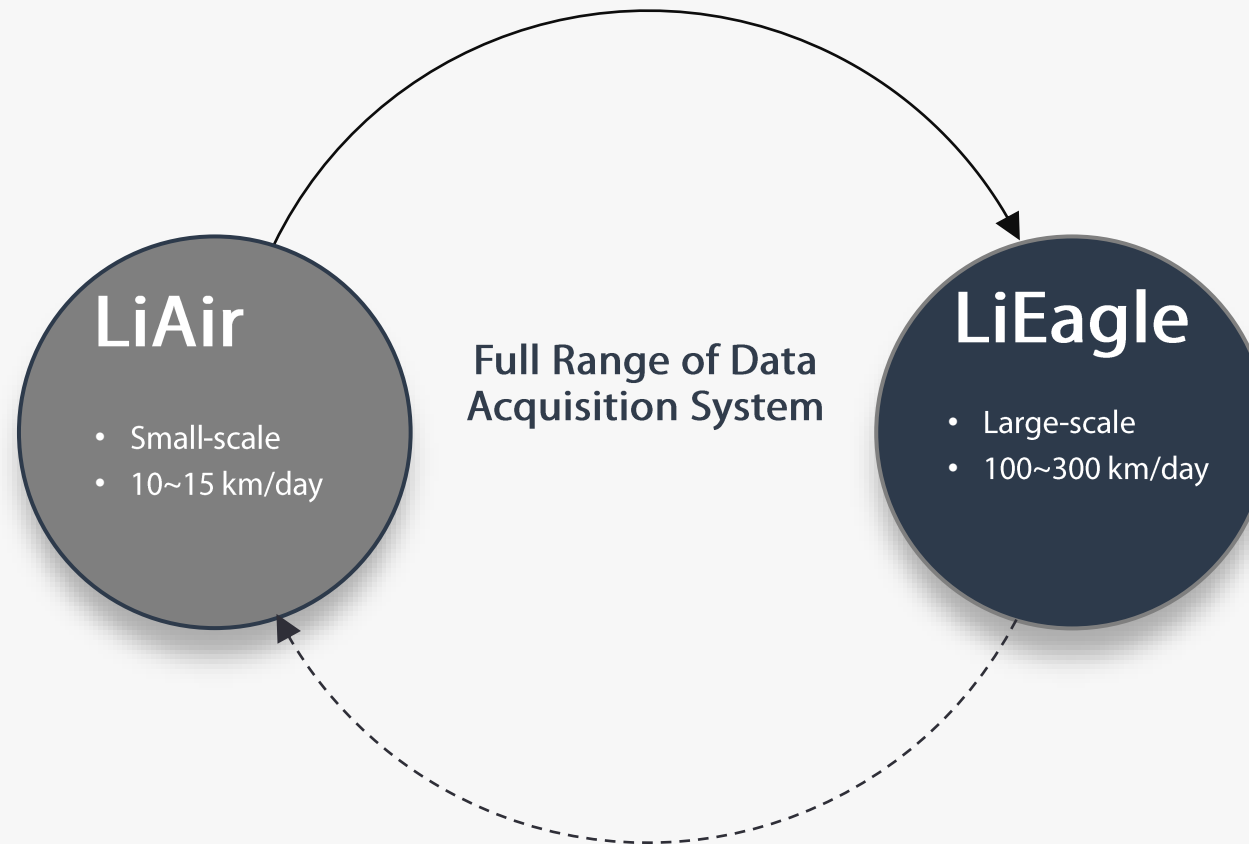
Products

01. Products

02. Transmission Tower & Powerline Inspection Solutions

03. Project Example

04. WHY GVI



Products

01. Products | 02. Transmission Tower & Powerline Inspection Solutions | 03. Project Example | 04. WHY GVI

LiAir- Small Aerial Systems

	Weight	Accuracy	Sensor Range	Field of View
LiAir V	1.0 kg	5 cm	max. 260 m	38.4°



SUAV



Products

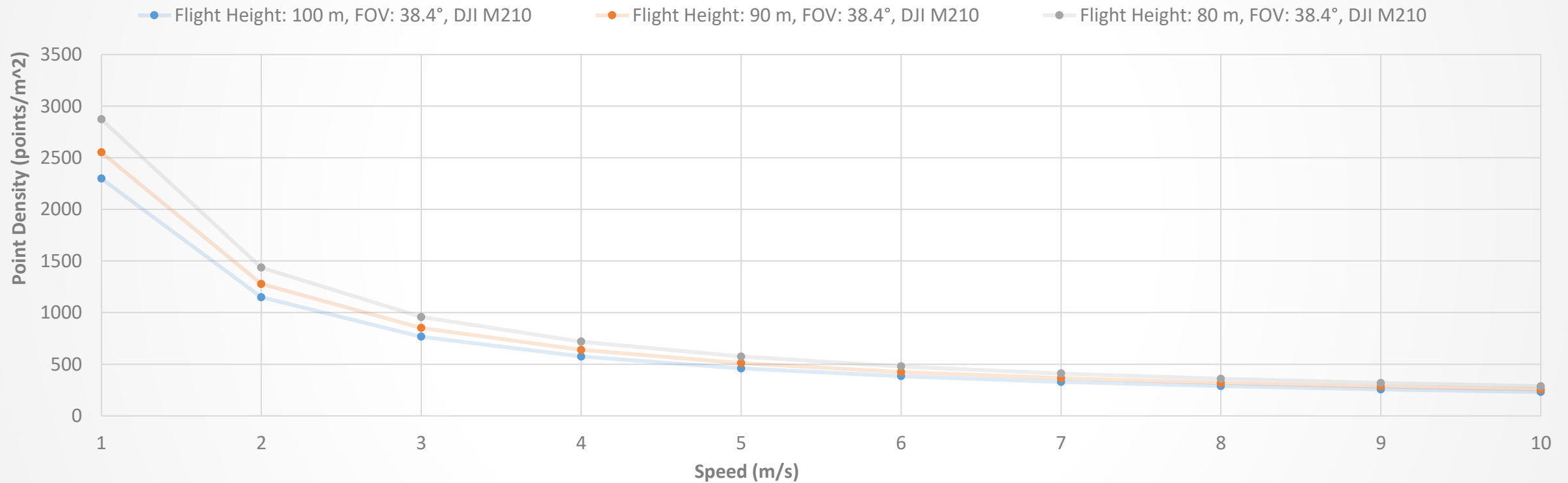
01. Products

02. Transmission Tower & Powerline Inspection Solutions

03. Project Example

04. WHY GVI

LiAir V (3 returns)



Products

01. Products | 02. Transmission Tower & Powerline Inspection Solutions | 03. User Cases | 04. Market Leadership

LiAir- Small Aerial Systems

LiAir 50

Weight	Accuracy	Sensor Range	Field of View
3.4 kg	5 ~ 10 cm	max. 100 m	360°



sUAV



Products

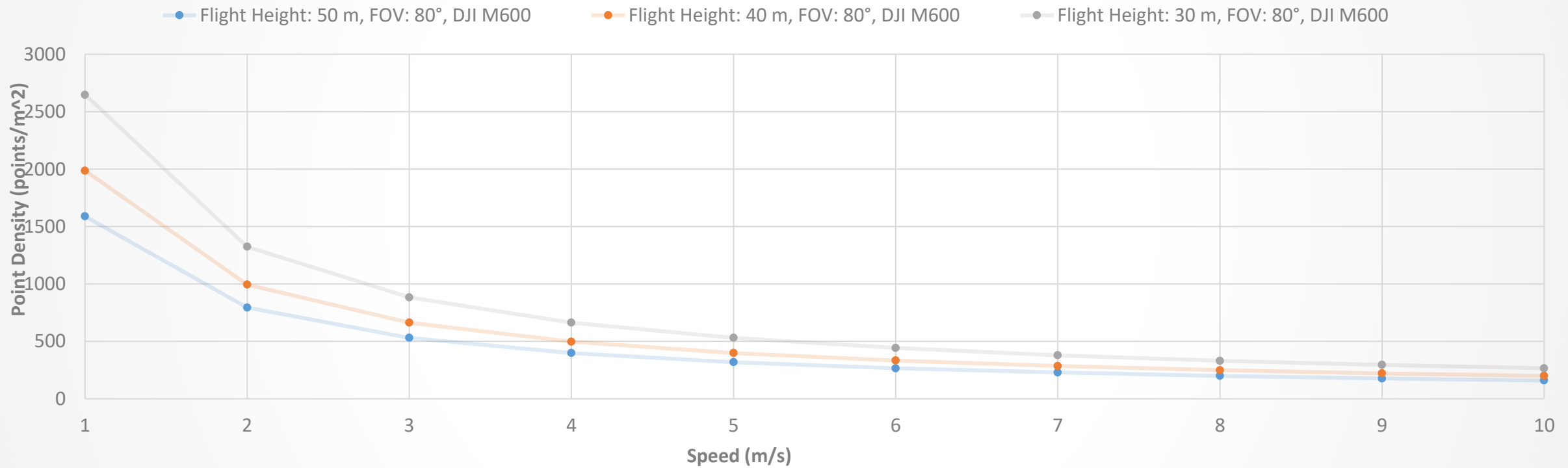
01. Products

02. Transmission Tower & Powerline Inspection Solutions

03. Project Example

04. WHY GVI

LiAir 50 (2 returns)



Products

01. Products

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03. Project Example

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LiAir- Small Aerial Systems

	Weight	Accuracy	Sensor Range	Field of View
LiAir 200	4.24 kg	5 ~ 10 cm	max. 220 m	360°



sUAV



Products

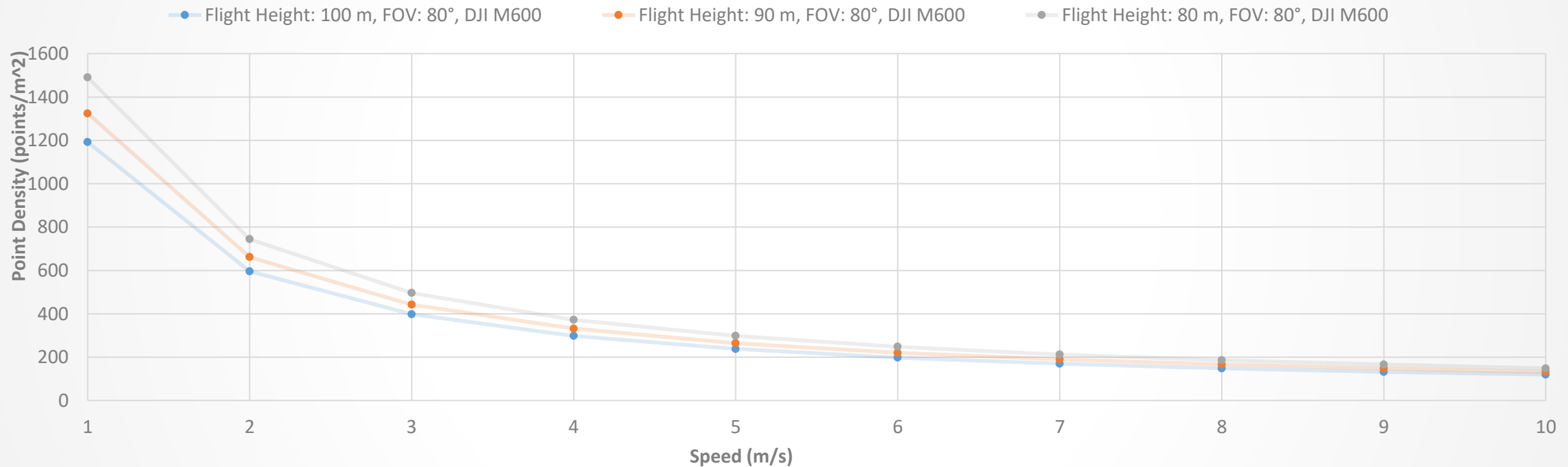
01. Products

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LiAir 220 (2 returns)



Products

01. Products

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LiAir- Small Aerial Systems

	Weight	Accuracy	Sensor Range	Field of View
LiAir 250	3.78 kg	5 cm	max. 250 m	360°



SUAV



Products

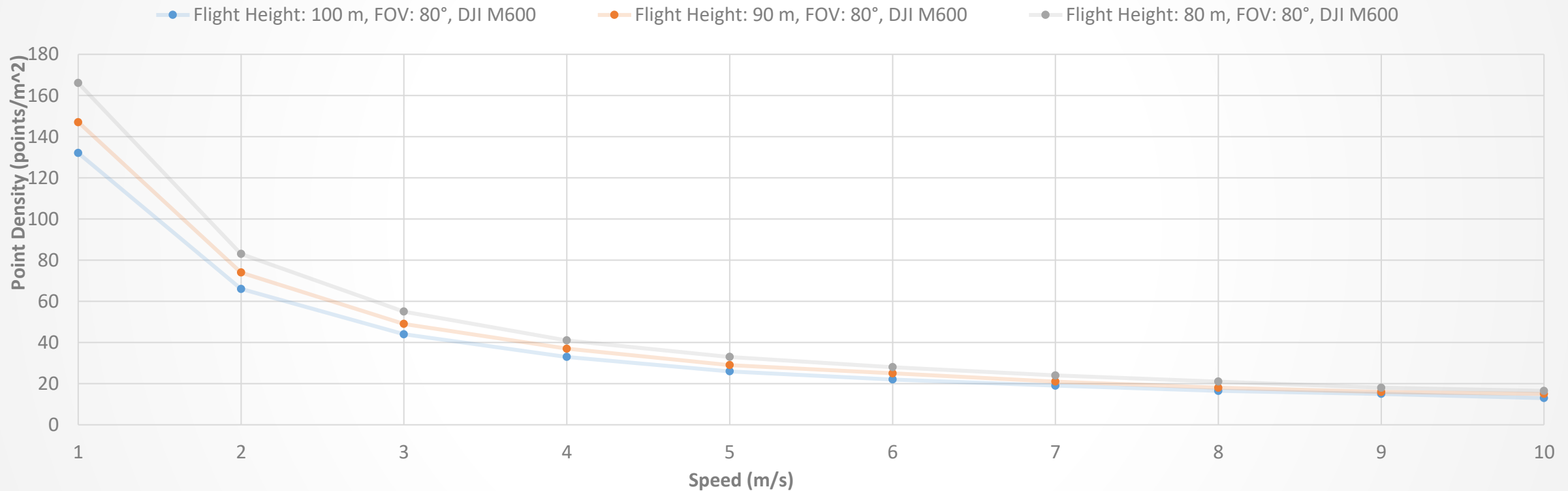
01. Products

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LiAir 250 (5 returns)



Products

01. Products

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LiEagle- Large Aerial Systems

LiEagle

Weight

20 kg

Accuracy

10 cm

Sensor Range

max. 1350 m

Field of View

330°



HELICOPTER



Products

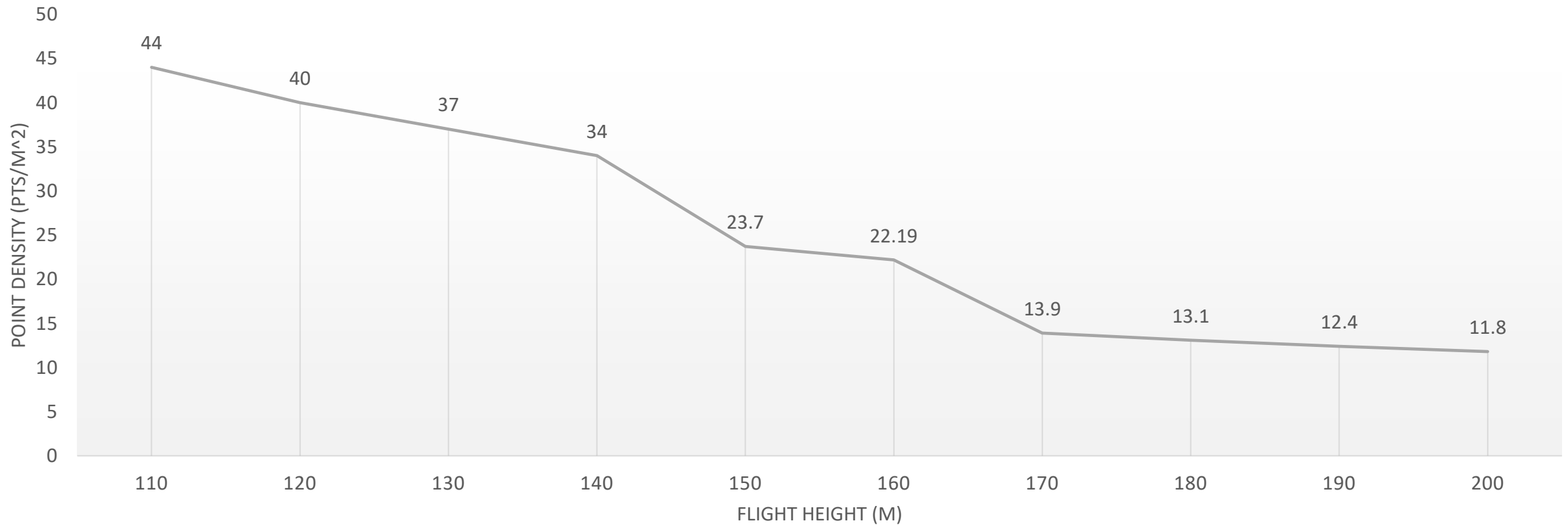
01. Products

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LiEagle (Flight Speed: 80 km/h)



Products

01. Products

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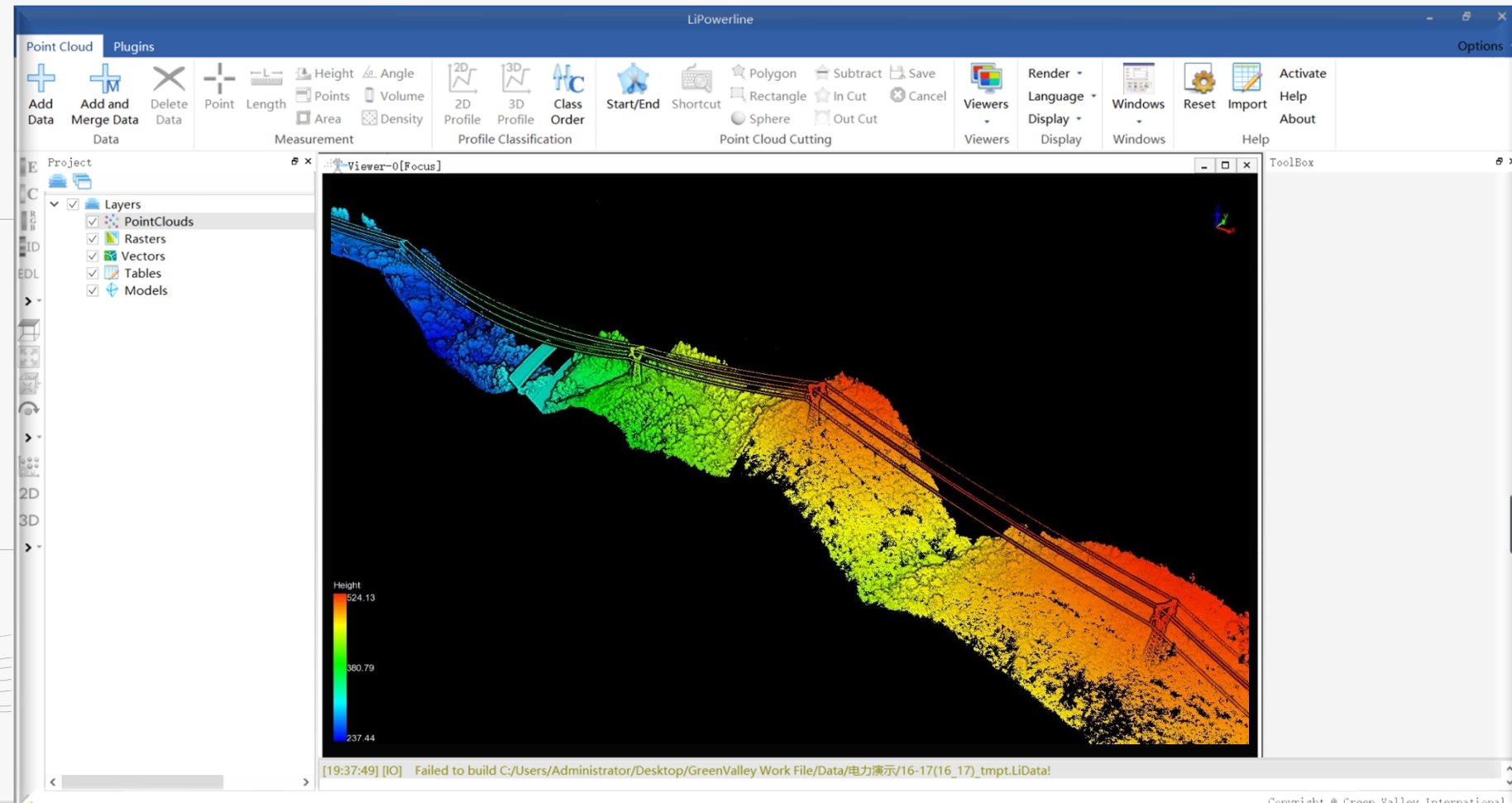
	LiAir V (M210)	LiAir 50 (M600)	LiAir 220 (M600)	LiAir 250 (M600)
Weight	1.03 kg	3.4 kg	4.24 kg	3.78 kg
Max Wind Speed	12 m/s	8 m/s	8 m/s	8 m/s
Recommended Flight Speed	5-8 m/s	5-8 m/s	5-8 m/s	5-8 m/s
Recommended Flight Height	100 m	50 m	90 m	100 m
Flight Time	24 min	22 min	19 min	21 min

Products

01. Products | 02. Transmission Tower & Powerline Inspection Solutions | 03. Project Example | 04. WHY GVI

LiPowerline

Full-Workflow Data
Processing with
Advanced
Algorithms



Part TWO

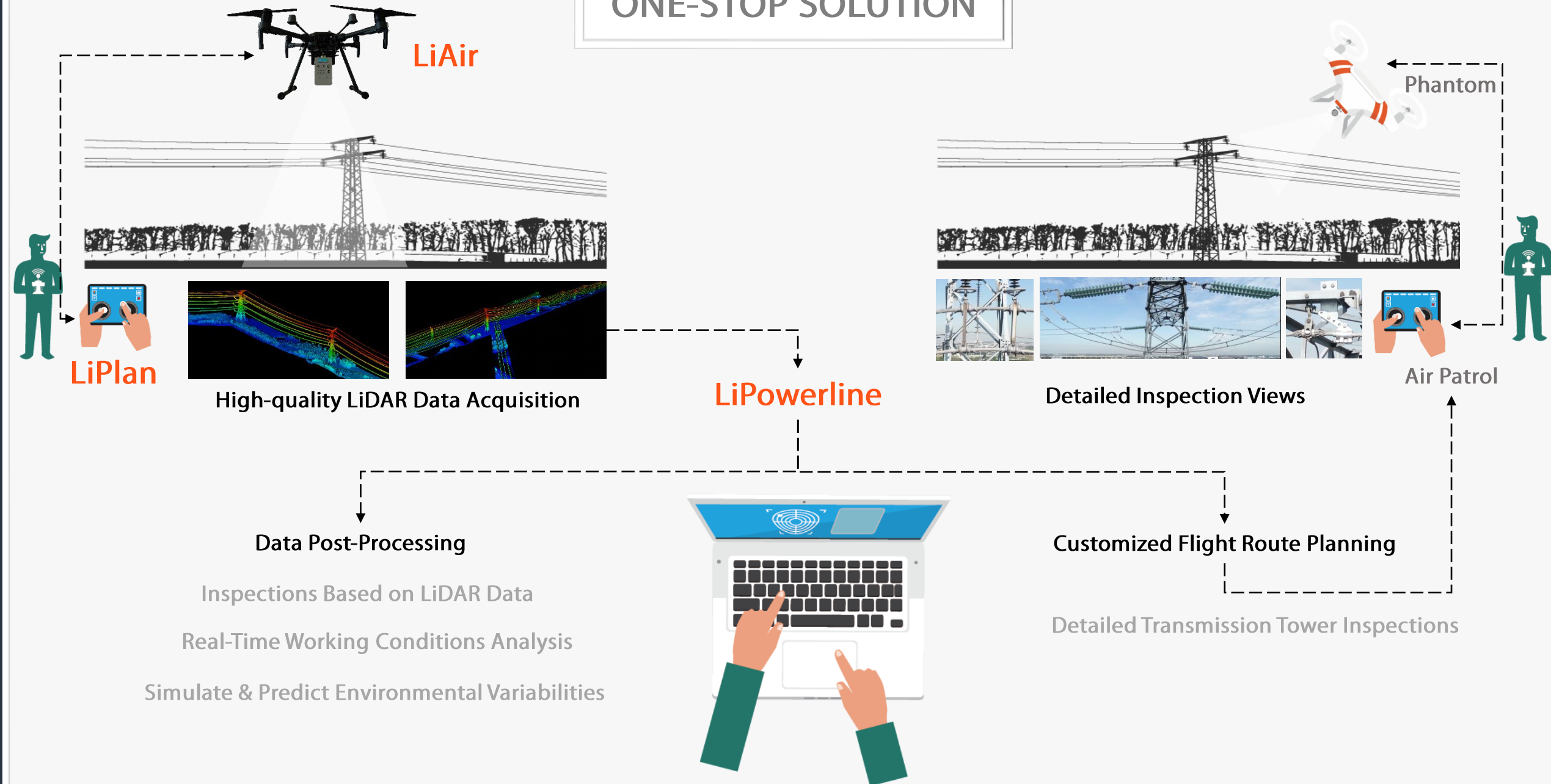


Transmission Tower & Powerline Inspection

ONE-STOP Transmission Tower and Powerline Inspections

Several processes and tasks need to be completed from the initial planning stage of an inspection or maintenance operation. A one-stop Solution combines **Customized Flight Route Planning, Sensors, UAVs, and Data Post-processing** systems to cover each **step** of the inspection process. This ensures a seamless communication through and between each stage, making the entire inspection process as efficient as possible.

ONE-STOP SOLUTION



Transmission Tower & Powerline Inspection Solutions

01. Product

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Send Drones to Inspect What You Cannot See

This will allow your operators to carry out the repairs and maintenance work in a more efficient matter, while also decreasing any safety hazards.

Transmission Tower & Powerline Inspection Solutions

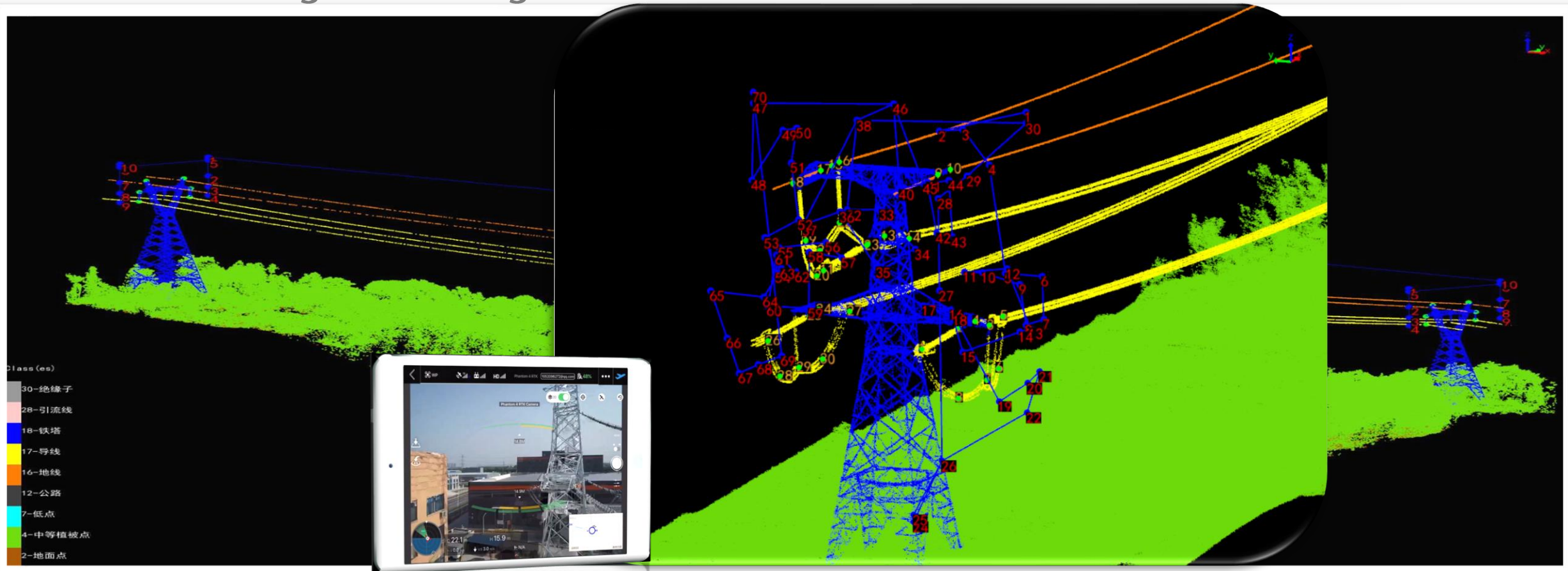
01. Product

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03. Project Example

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1) Customized Flight Planning



Transmission Tower & Powerline Inspection Solutions

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2) Detailed Transmission Tower Inspection

The large set of high-resolution **images** of the main components of the tower **can be automatically named** by the system.

e.g. 500kV-TowerNo.2_Berkeley-#-Middle Part-Next to TowerNo.1-Insulators-a horizontal angle-Feb. 17th, 2020

Detailed Inspection Views

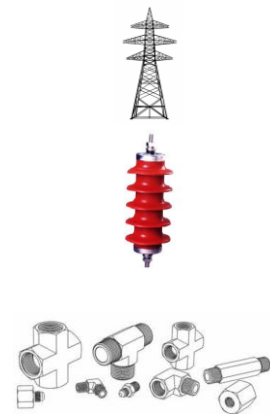


Main Inspection Targets

Pylon

Insulators

Power Line Fittings



Transmission Tower & Powerline Inspection Solutions

01. Product

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03. Project Example

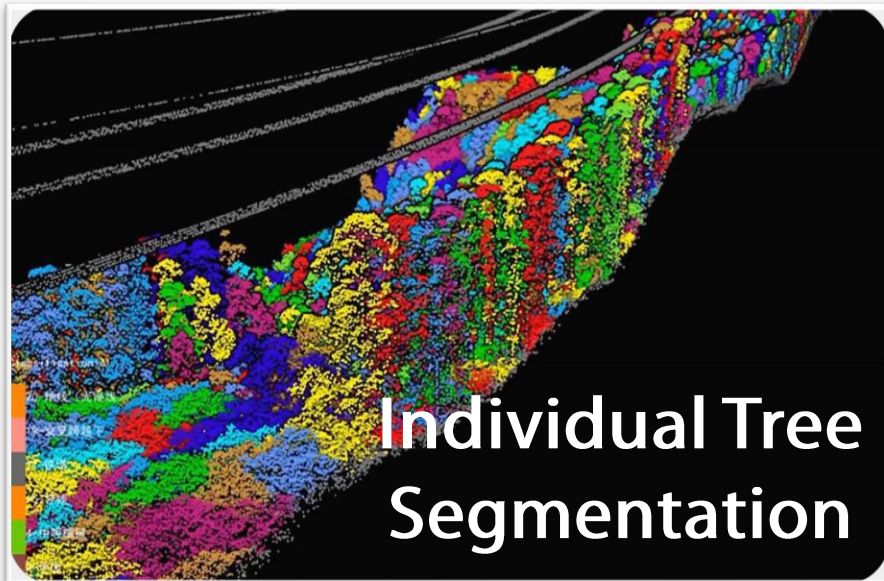
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Issues such as vegetation encroachment, downed wires, and line sagging due to ice-load, wind and air temperature **can be effectively detected using LiDAR.**

Transmission Tower & Powerline Inspection Solutions

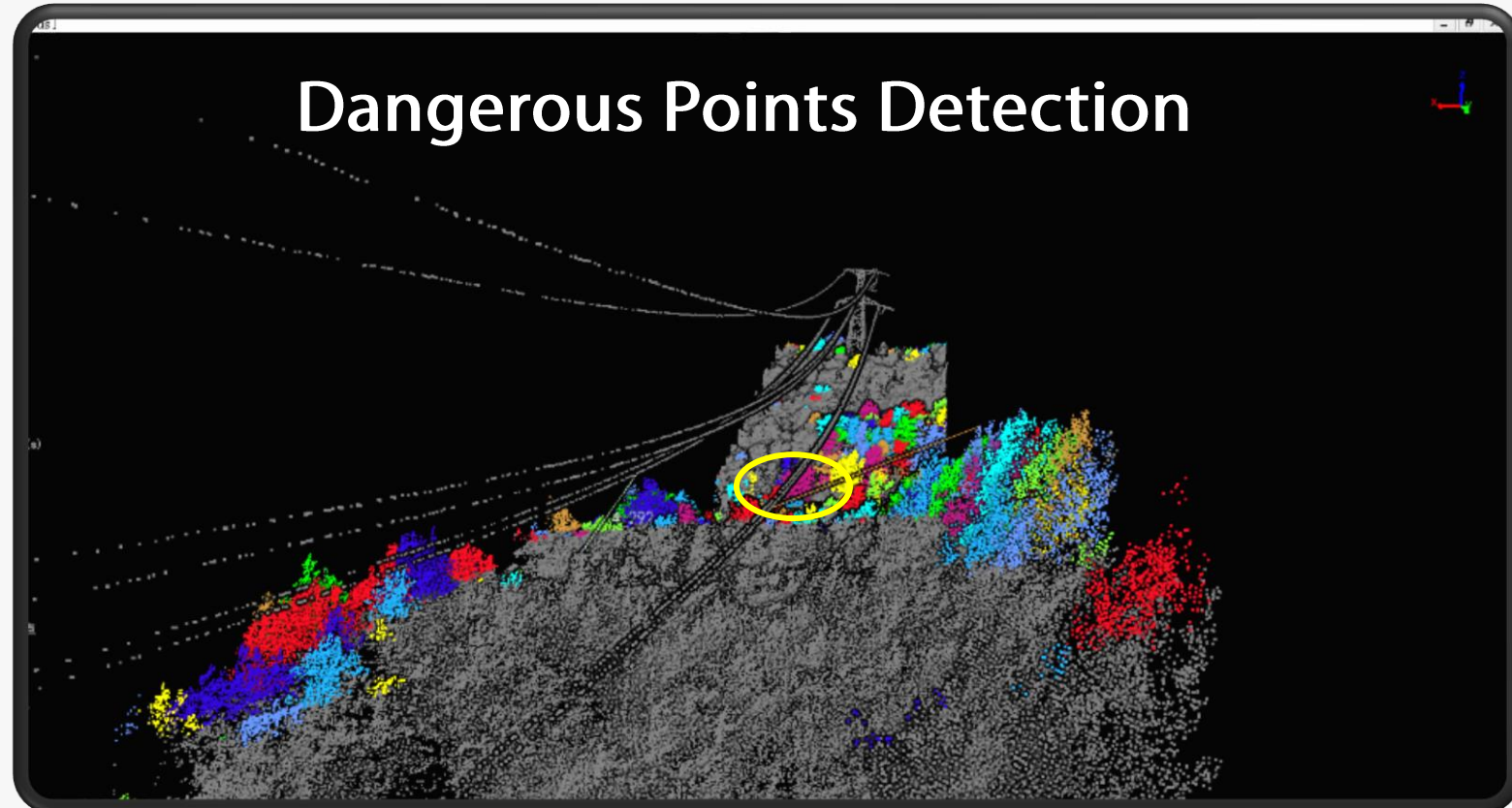
01. Product | 02. Transmission Tower & Powerline Inspection Solutions | 03. Project Example | 04. WHY GVI

1) Real-Time Working Conditions Analysis



a/Powerline/3-4_Extract by Class1_ALS Point Cloud Segmentation.csv

TreeLocationX	TreeLocationY	TreeHeight	CrownDiameter	CrownArea
7943.050	2564153.460	55.610	3.321	8.662
7949.690	2564155.070	55.500	3.696	10.726
7933.110	2564152.830	53.780	6.905	37.444



Transmission Tower & Powerline Inspection Solutions

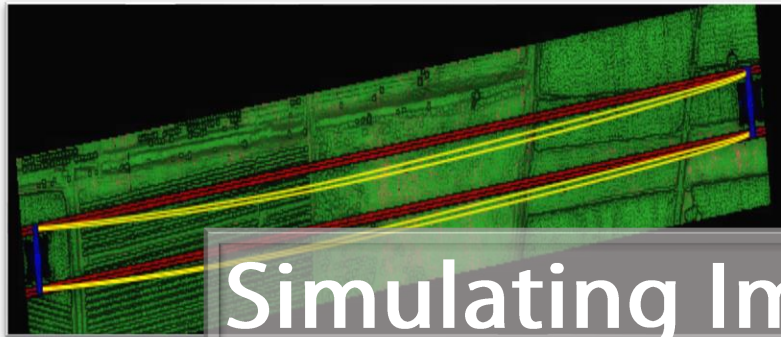
01. Product

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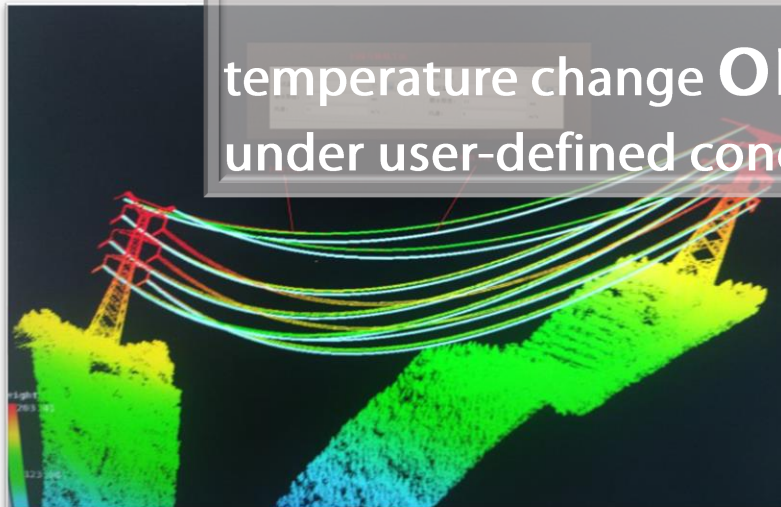
03. Project Example

04. WHY GVI

2) Simulation & Prediction Base On Environmental Factors



Simulating Impacts of tree fall, wind, ice-loading, and temperature change **on conductor sag** and **sway** under user-defined conditions.

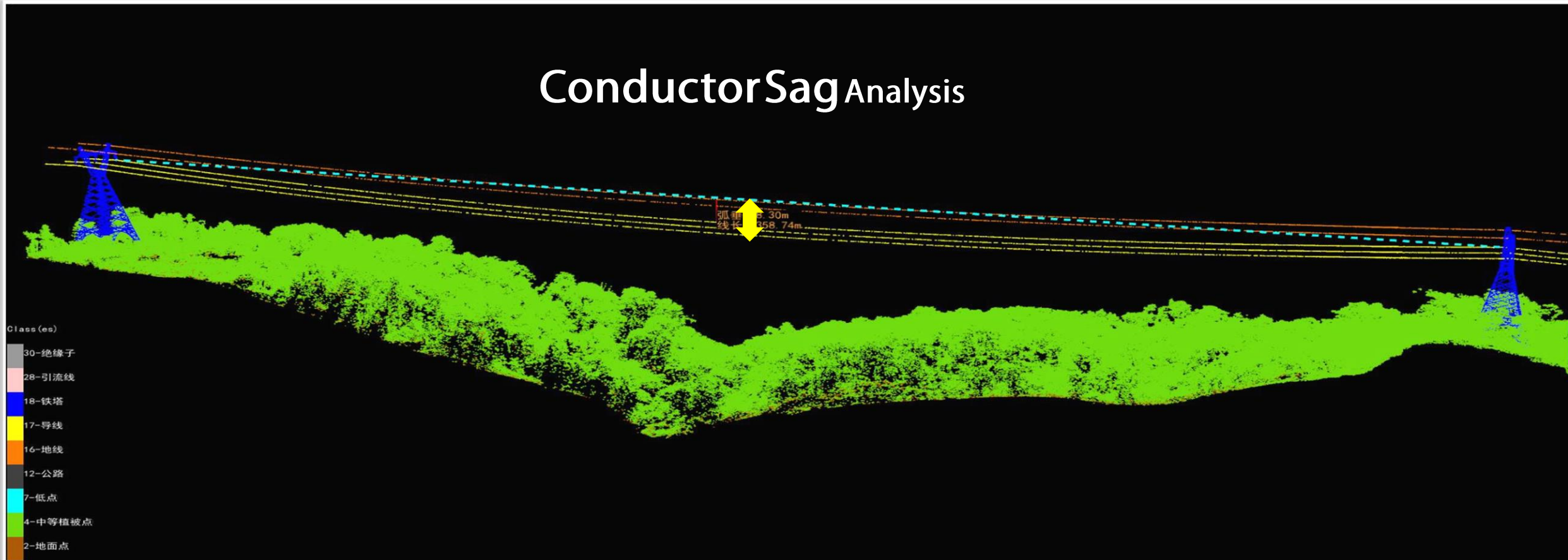


Transmission Tower & Powerline Inspection Solutions

01. Product | 02. Transmission Tower & Powerline Inspection Solutions | 03. Project Example | 04. WHY GVI

3) Inspection Based on LiDAR Data

Conductor Sag Analysis



Transmission Tower & Powerline Inspection Solutions

01. Product

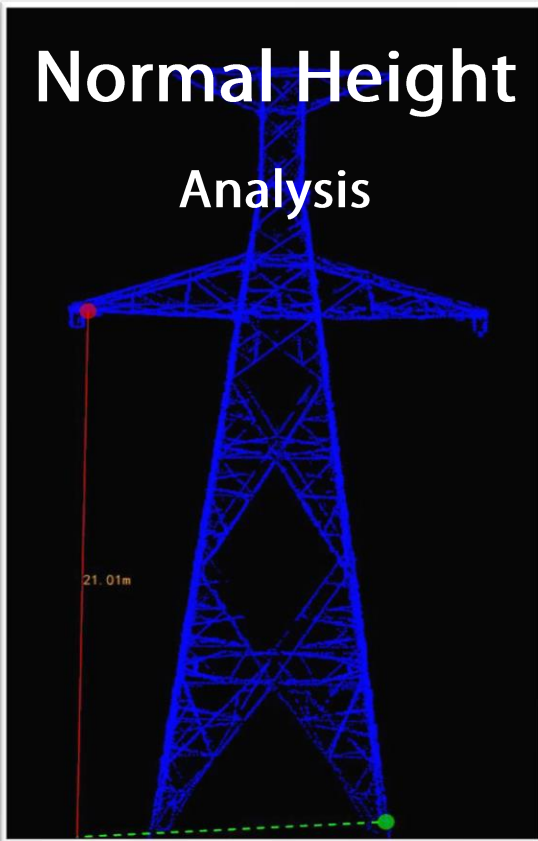
02. Transmission Tower & Powerline Inspection Solutions

03. Project Example

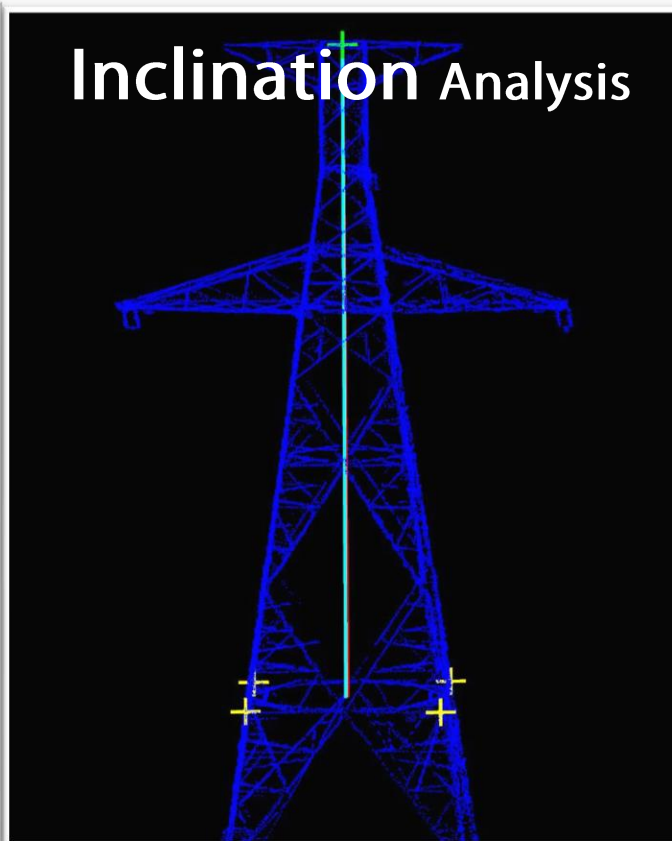
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3) Inspection Based on LiDAR Data

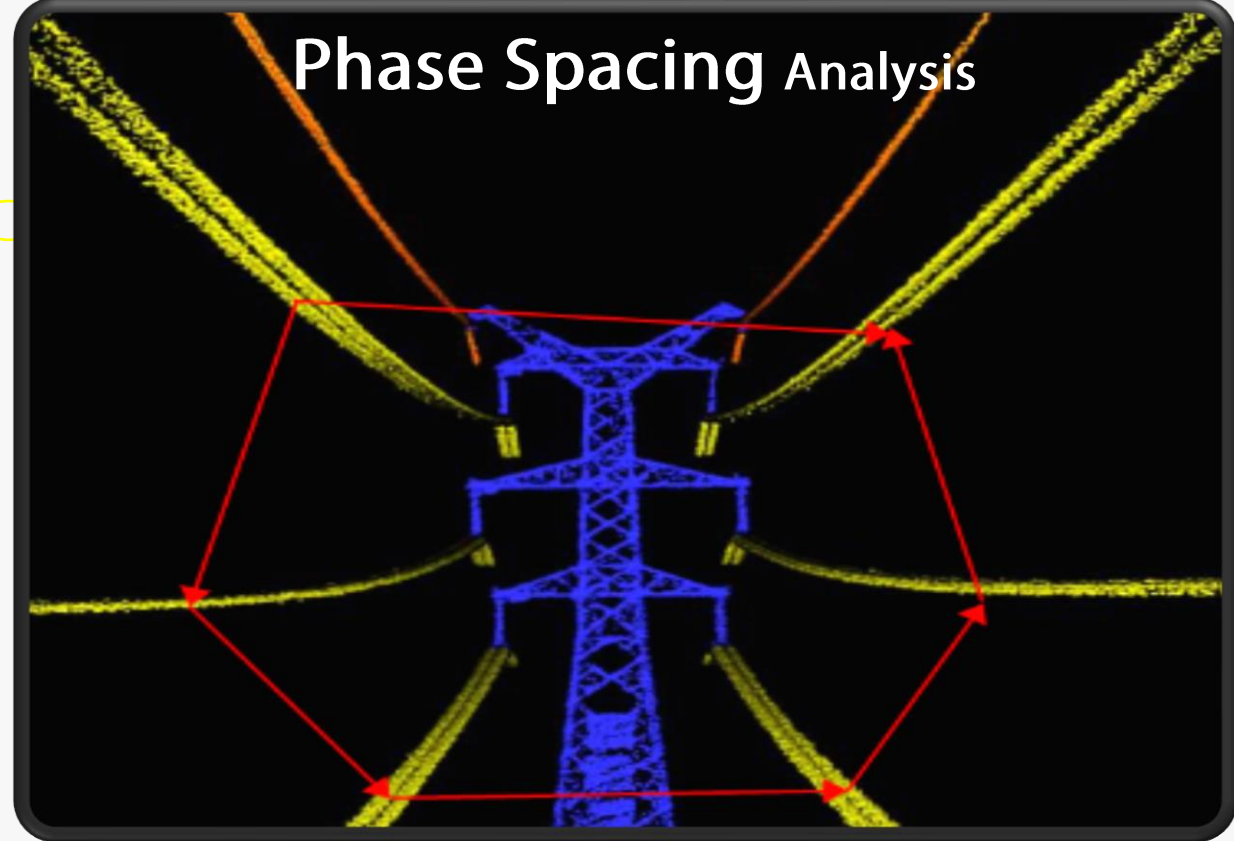
Normal Height Analysis



Inclination Analysis



Phase Spacing Analysis



Transmission Tower & Powerline Inspection Solutions

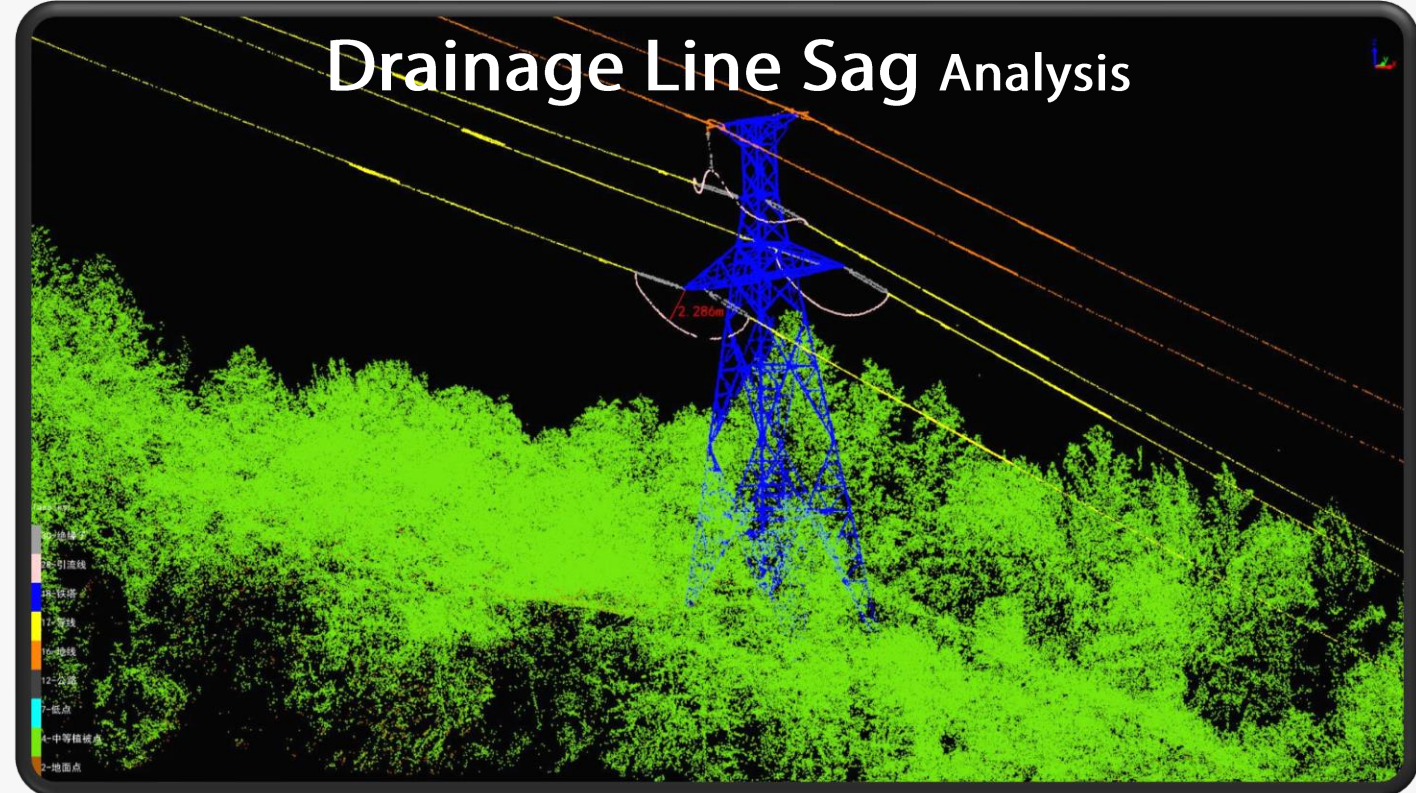
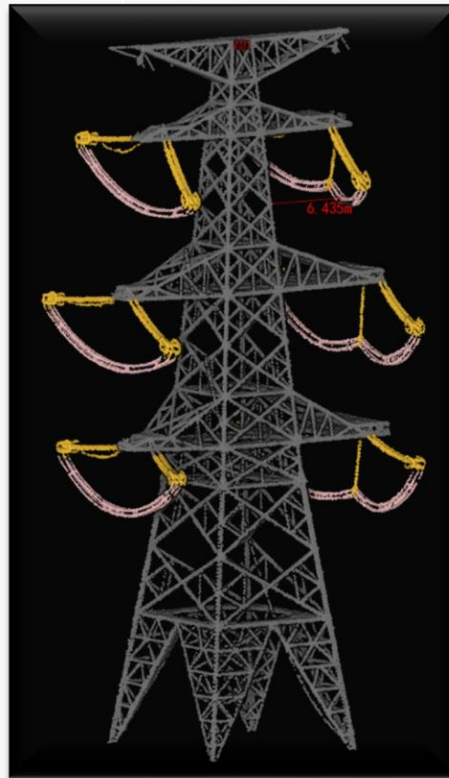
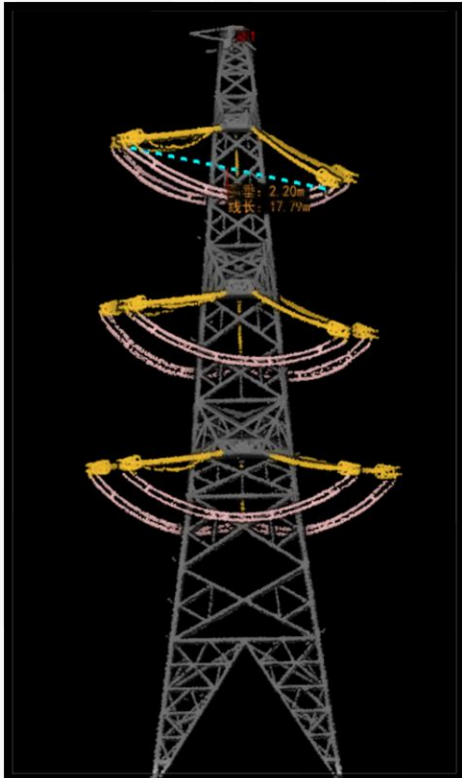
01. Product

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03. Project Example

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3) Inspection Based on LiDAR Data



Part THREE



Project Examples

Project Example

01. Product

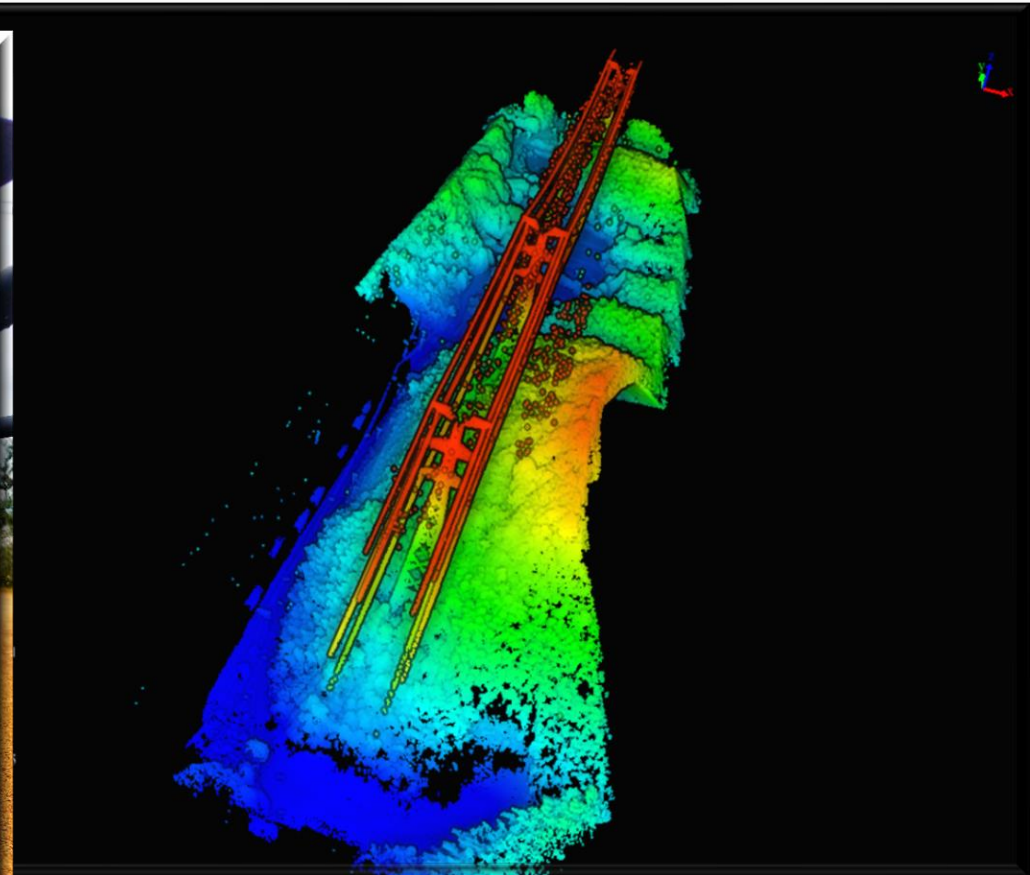
02. Transmission Tower & Powerline Inspection Solutions

03. Project Example

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Project Example 1

- LiAir 220
- 500 KV
- Data Acquisition



Project Example

01. Product

02. Transmission Tower & Powerline Inspection Solutions

03. Project Example

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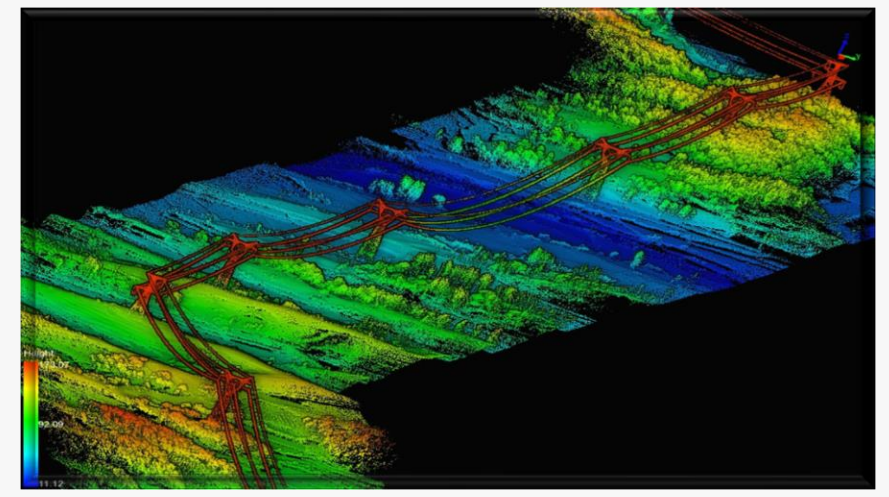
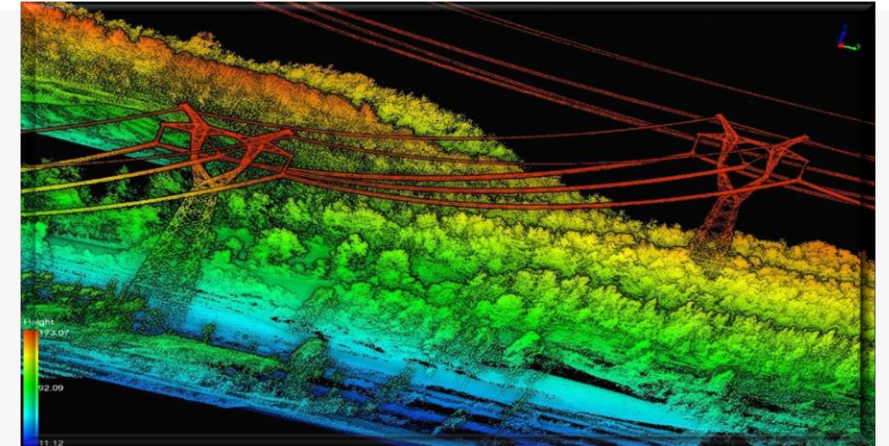
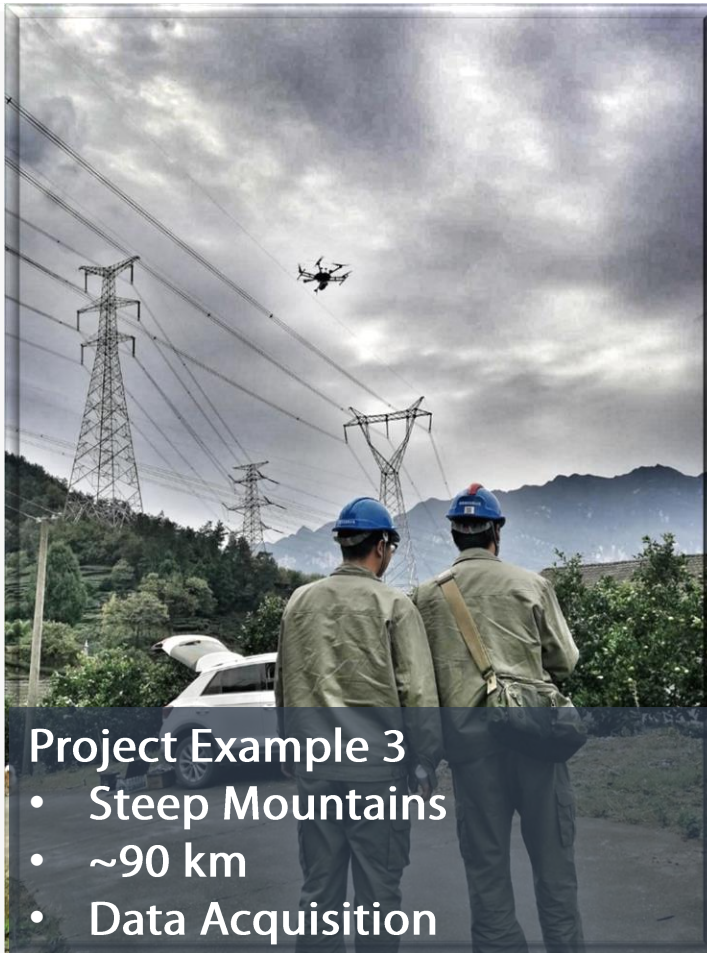
Project Example

01. Product

02. Transmission Tower & Powerline Inspection Solutions

03. Project Example

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Project Example

01. Product

02. Transmission Tower & Powerline Inspection Solutions

03. Project Example

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Project Example 4

- Detailed Transmission Tower Inspection
- Phantom 4RTK, M210 RTK
- Detailed Inspection View



Part FOUR



WHY GVI



About GVI

GreenValley International Inc (GVI), headquartered in Berkeley, California, is a leading innovator of 3D mapping technologies. The company provides a wide-range of advanced aerial, terrestrial, and mobile LiDAR survey and mapping hardware systems as well as cutting edge software and service solutions.

To date, GVI has established a global distribution network of 31 partners covering 19 countries and territories. **Sales grew 300%** in 2019, year-to-year. Customer base now covers 33 countries and territories across the globe.

WHY GVI

01. Product | 02. Transmission Tower & Powerline Inspection Solutions | 03. Project Example | 04. WHY GVI

Product Development History

Hardware:

- LiAir V, LiAir 250, LiAir 220, LiAir50, LiAir 1000
- LiEagle, LiHawk
- LiBackpack DGC50, LiBackpack DG50, LiBackpack D50, LiBackpack C50, LiBackpack 50
- LiMobile, LiMobile Pro

2019 & 2020

Software:

- LiDAR360 v4.0, LiPowerline, LiGeoreference, LiAcquire, LiPlan, LiFuser-BP, LiMapper, LiPPK+LiMapper for P4R, LiCloud.

2014

LiAir, LiMobile, LiForest

2015

LiAir 2.0, LiMapper, LiEagle, LiAcquire

2016

LiDAR360, LiMapper Lite, LiMapper 1.1, LiForest

2017

LiBackpack, LiPowerline, LiDAR360 Lite, LiMapper Pro

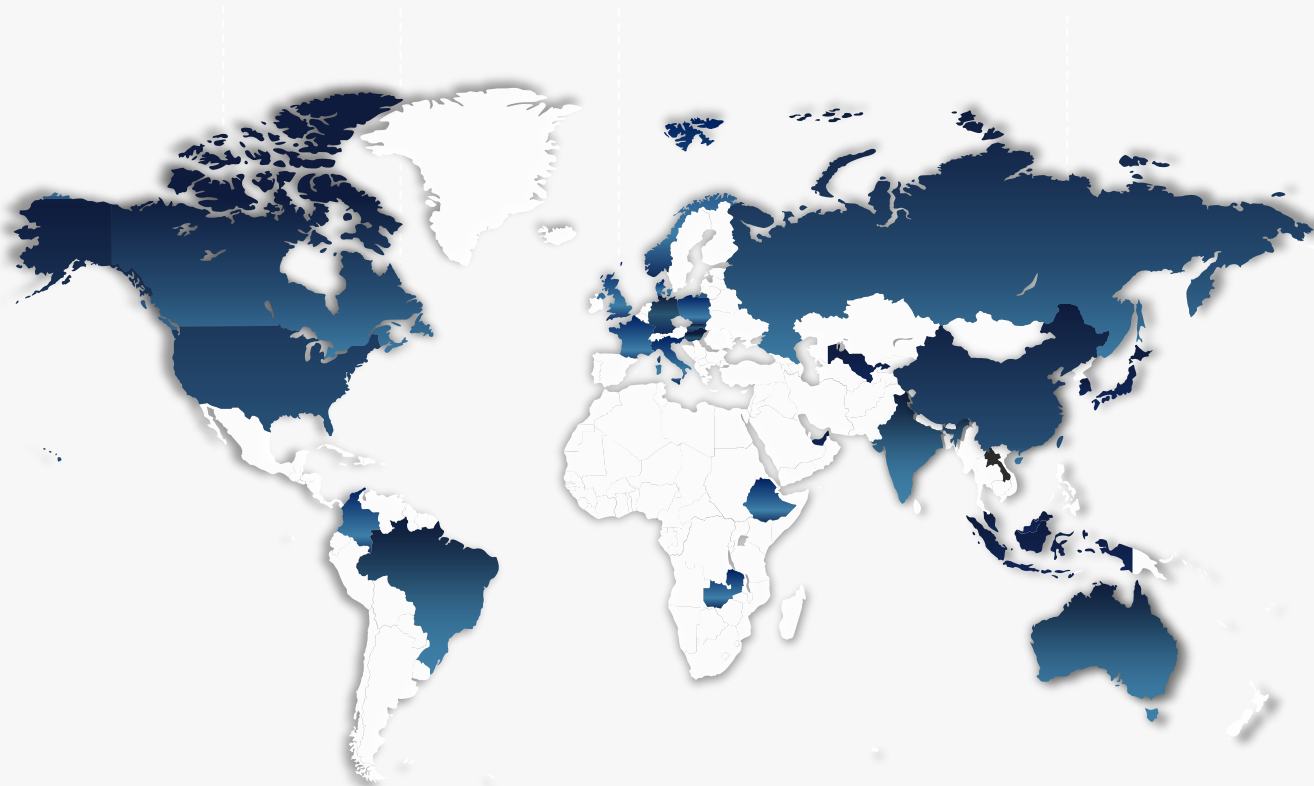
2018

LiBackpack (50, D50), LiAir (50, 100, 200, 250, 1000), LiEagle(1350, 2000), LiPlan, LiStreet

WHY GVI

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Customer Across the Globe



Countries		Countries	
Canada		Denmark	
Japan		Uzbekistan	
China, Hongkong		France	
Indonesia		Republic of Korea	
United States of America		Zambia	
Germany		Italy	
Poland		United Arab Emirates	
Malaysia		United Kingdom of Great Britain	
Russian Federation		China, Taiwan	
Singapore		Slovakia	
Ethiopia		Hungary	
Brazil		Slovenia	
Australia		Colombia	

WHY GVI

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Our Customers



UNIVERSITY OF
GUAM
UNIBETSEDÂT GUAHAN



L-Università
ta' Malta



CIVIL AND WATER ENGINEERING
DESIGN CONSULTANT

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Our Customers





THANK YOU

Please visit our website for more detailed product information and company news

<https://greenvalleyintl.com/>