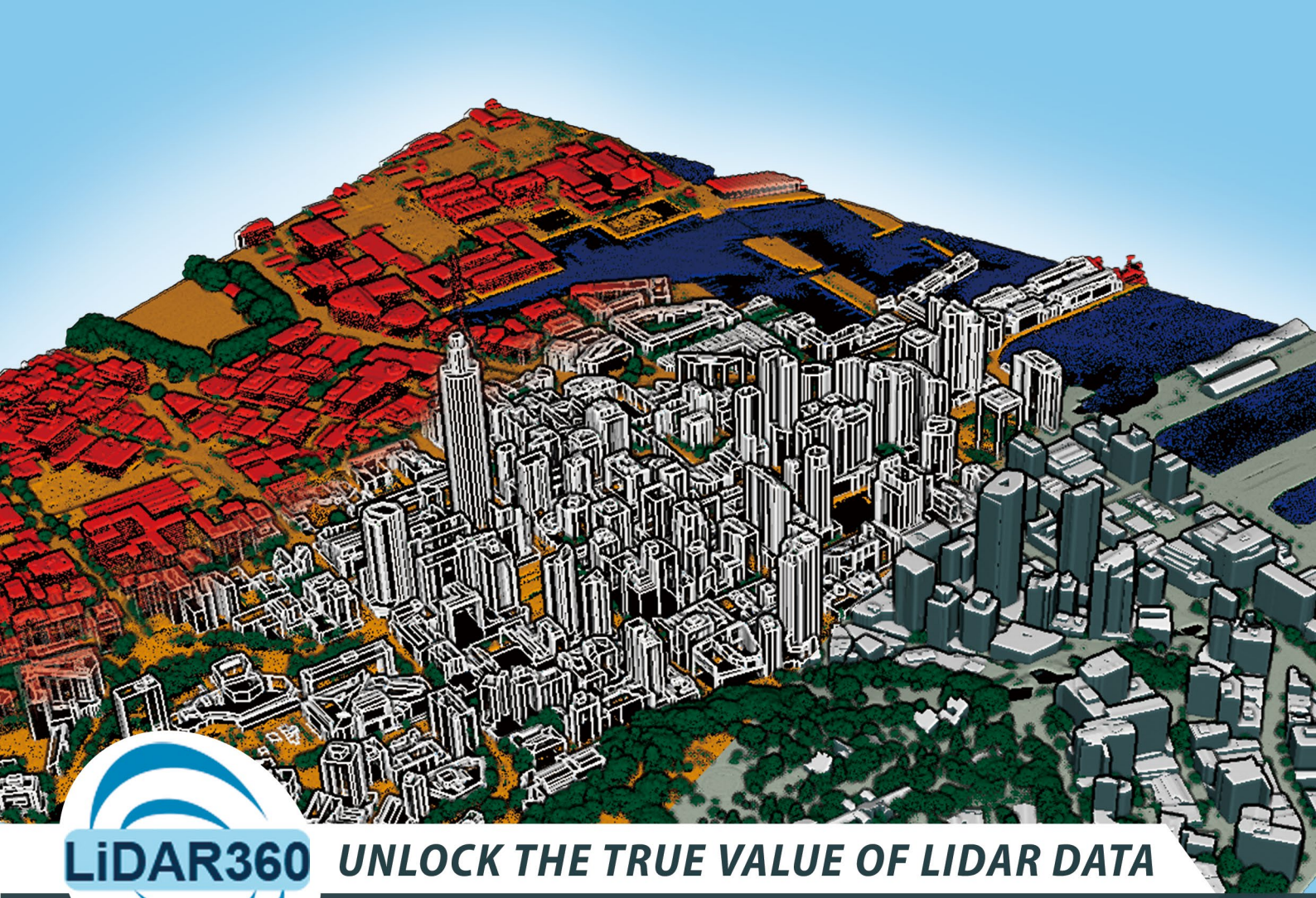


LiDAR360

UNLOCK THE TRUE VALUE OF LIDAR DATA

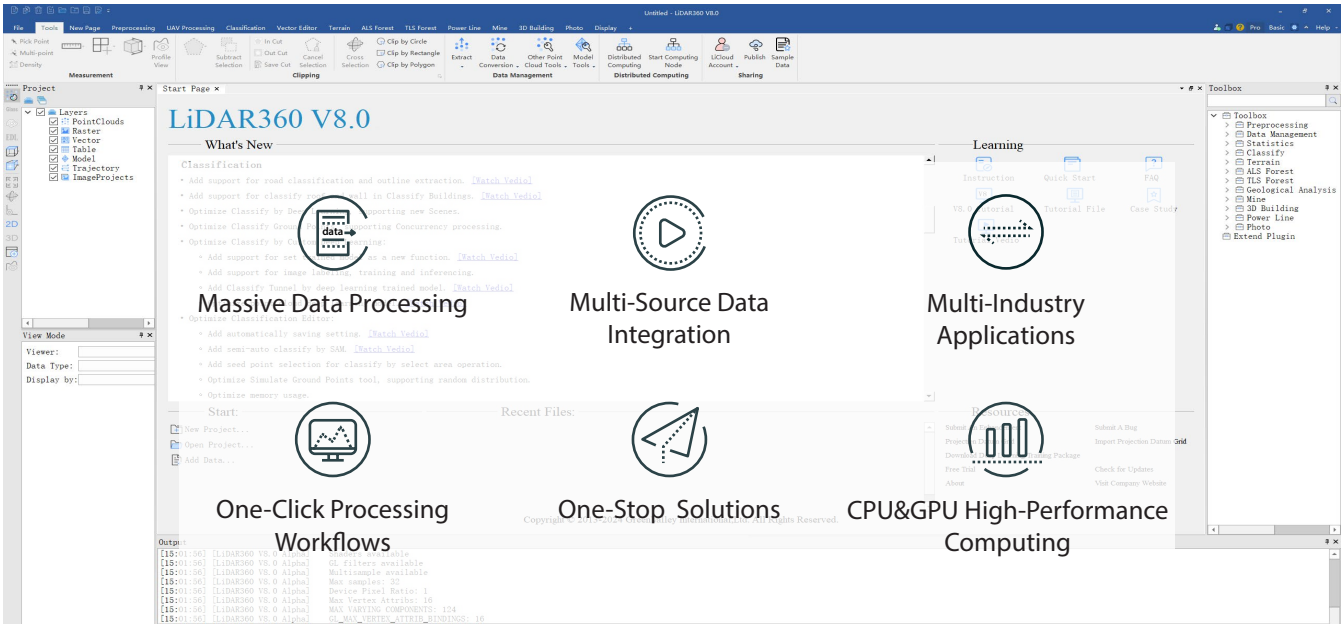
LiDAR360

Professional LiDAR Solutions

SOFTWARE

PROFESSIONAL GRADE LIDAR POINT CLOUD PROCESSING PLATFORM

LiDAR360 is an application software designed for processing airborne, mobile, and UAV LiDAR data and images. It features over a dozen internationally leading data processing algorithms, providing TB-level data visualization and processing capabilities. LiDAR360 covers more than 700 tools across various industries, including Topographic Mapping, Forestry Survey, Engineering Surveying, Mine Safety, Digital Twin, Geological Disaster Assessment, and Powerline Hazard Inspection. Offering one-stop solution to users in 137 countries and regions worldwide.



Platform

- **Accuracy Optimization and Quality Check**

One-click elimination of point cloud/image elevation discrepancy caused by various error sources such as boresight, trajectory and laser, enhancing accuracy and quality throughout the entire process. Utilize target recognition to check point cloud accuracy by control points, and seamlessly transform data into the control point coordinate system.

- **Image Project Processing**

Supports aerial triangulation (AT) for RGB, infrared, and hyperspectral images captured from nadir or oblique angles, including camera calibration, distortion correction, and feature interaction, resulting in optimal image outcomes. Targets automatically detection and GCPs matching by one-click, enhancing data quality and absolute accuracy.

- **Batch Processing and Distributed Computing**

Freely combine various processing workflows to build one-click processing capabilities. Can be configured to run on a computer cluster, with processing distributed across several computer nodes connected to the local network, greatly enhancing computational efficiency.

Distributed Computing Reference Efficiency Table

Device Configuration	Function	Data Size	Compute Nodes Number	Efficiency Improvement
System: Windows 10 **CPU:** 11th Gen Inter® i7 **GPU:** NVIDIA RTX 3050	Classify Air Points	15GB	3	123%
			4	137%
	Smooth+ Subsampling+ Remove Outliers+ Classify Ground Points	30GB	4	168%
			5	278%
			6	375%

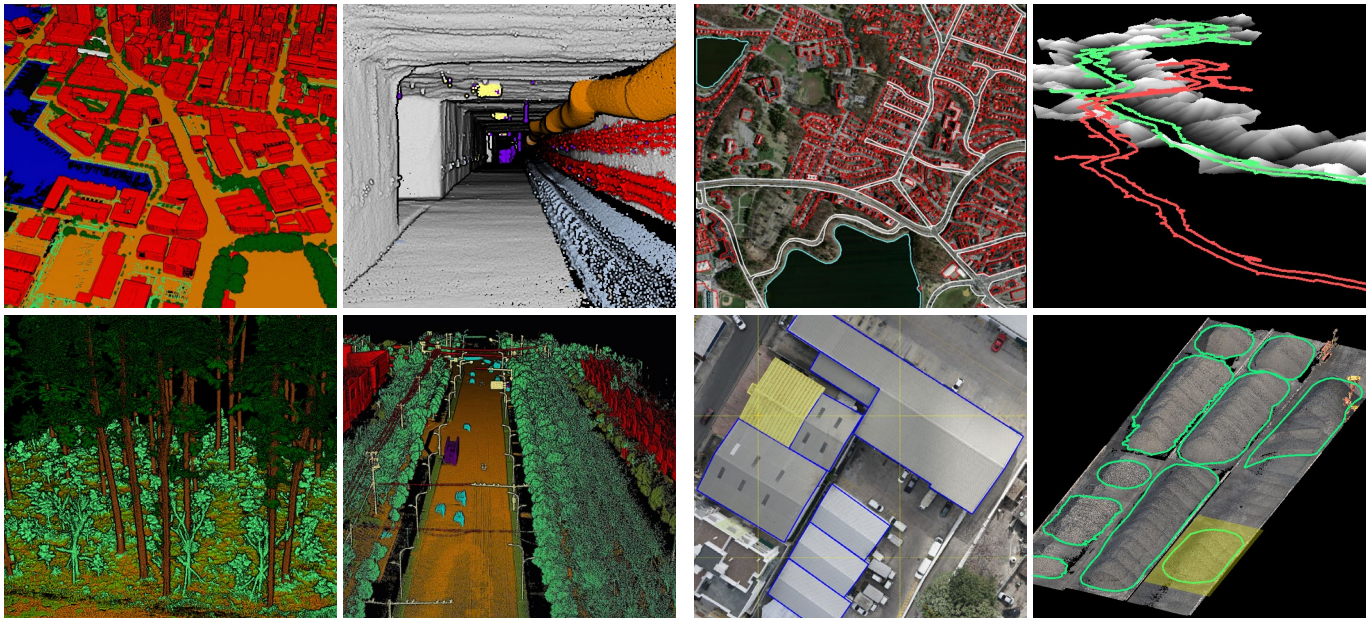
Due to the influence of different device configurations, switches, network bandwidth, and structure, the efficiency improvement of distributed computing may vary. The above figure is for reference only.

- **Features Extraction & Classification**

Using AI algorithms, one-click classification of 32 types of features in point clouds, including ground, buildings, vegetation and so on. Extract various feature contours from images. Supports AI training for point clouds and images, creating models for classifying/extracting any feature to meet multi-industry application needs. Semi-automatic classification editing with SAM.

- **Vector Editor**

Seamlessly integrates CAD/GIS data, collaborates with multi-source data, offering over 50 editing, annotation, and semi-automatic feature extraction tools, providing a new experience for 2D and 3D vector drawing.



01 Photo Module

- Supports the rapid construction of orthophotos from RGB, infrared, and multispectral data collected by single or multiple cameras.
- Accuracy correction using control points is supported, and targets can be automatically identified and matched to easily enhance the quality and absolute accuracy of the image project results.
- Improves the accuracy of point cloud and image matching, providing reliable support for intelligent feature extraction, interactive processing, orthophoto production, and model texturing.

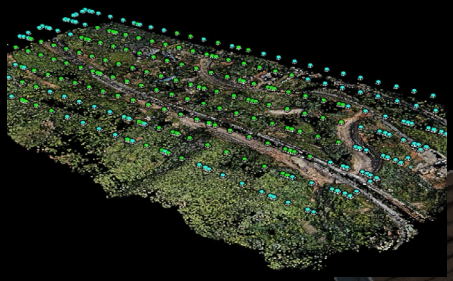
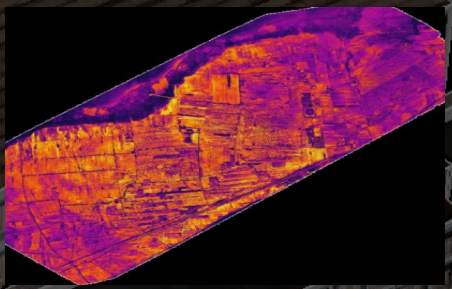
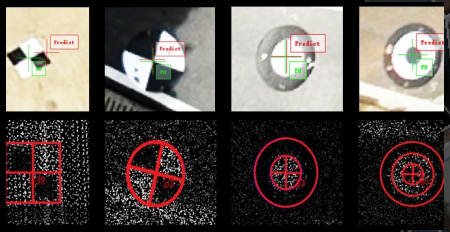


Image Project Construction

Ture Color

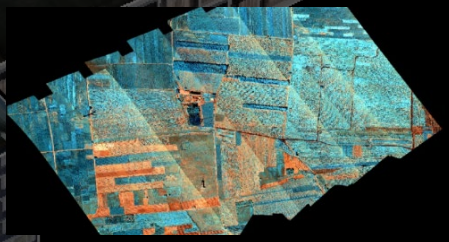


Infrared



Target Identification Types

Multispectral



Hyperspectral

Forestry Survey and Management 02

LiDAR has unique advantages in forestry surveys. LiDAR360 can automatically extract forest parameters such as canopy density and clearance rate, as well as single tree attributes such as tree height, diameter at breast height, crown width, and trunk volume based on LiDAR point cloud data and conduct intelligent statistical analysis to help sample plot surveys, carbon sink detection, and other applications, providing unparalleled support for forest resource surveys.

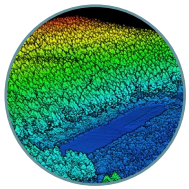
LiDAR Data Acquisition

Helicopter

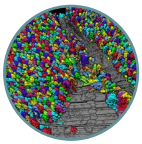
UAV

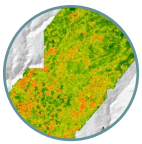
Terrestrial

LiDAR Data Processing



Integrated Data Presentation, Analysis, and Assessment

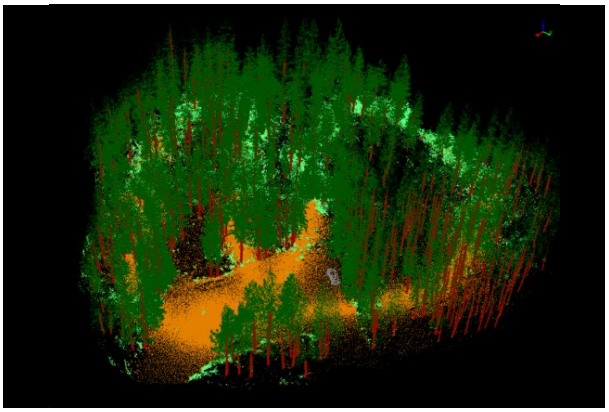




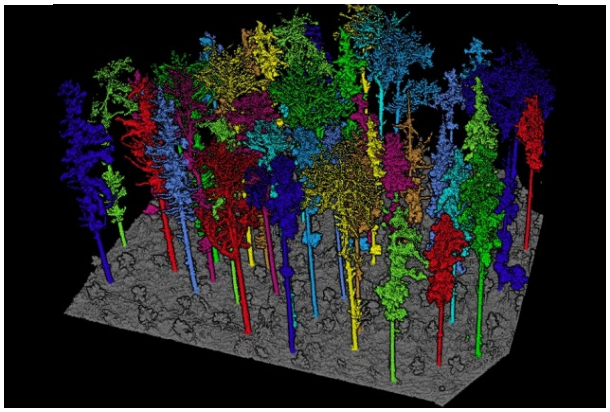
a full range of forestry 3D scanning techniques

Forest Inventory Surveys

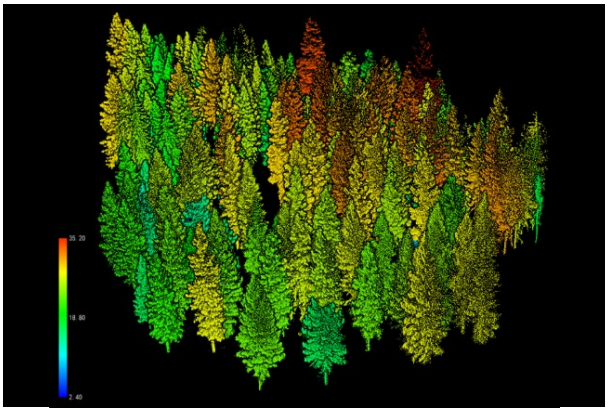
- From airborne or ground-based laser point clouds, segment each individual tree, classify trunk and foliage point clouds, and obtain attributes such as tree height, branch diameter at breast height, trunk curvature, and calculate over 20 properties including biomass and trunk volume. This enhances the efficiency and accuracy of forestry surveys.



Forest Classification



Individual Tree Segmentation

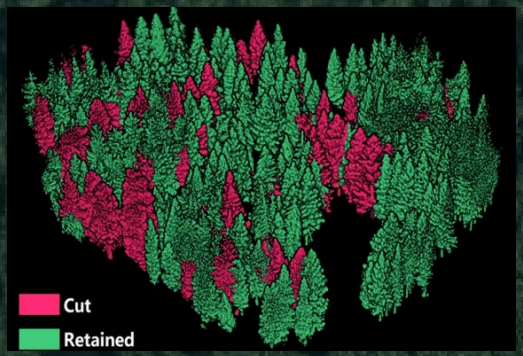


Display by Tree Height

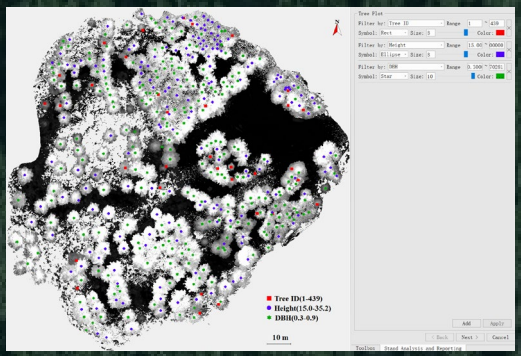
Individual Tree Atributes	
Location	DBH
Tree Height	CBH
Crown Length	Trunk Volume
Crown Length(S-N)	Trunk Curvature
Crown Length(E-W)	Trunk Sections
Crown Area	Biomass
Crown Volume	Above Ground Biomass
Altitude	Under Ground Biomass
Slop	BCF
Aspect	RSR
Azimuth&Distance	etc.

Individual Tree Attributes

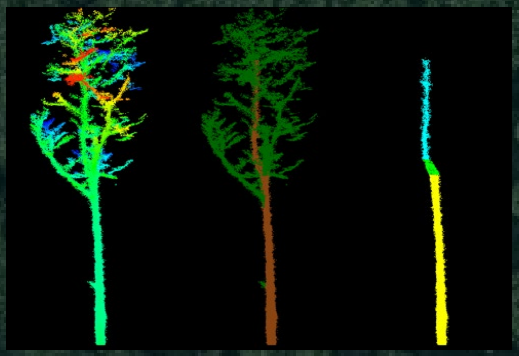
- Perform thinning and trunk cutting analysis, calculate standing timber volume, and assist in forest management and administration.
- At the stand scale, calculate canopy area index, canopy closure, and other stand parameters, and use various regression analysis functions to invert forest parameters.
- This provides precise and efficient support for forestry resource surveys, detailed management, carbon sink monitoring, and related tasks.



Thinning Analysis



Sample Plot Map



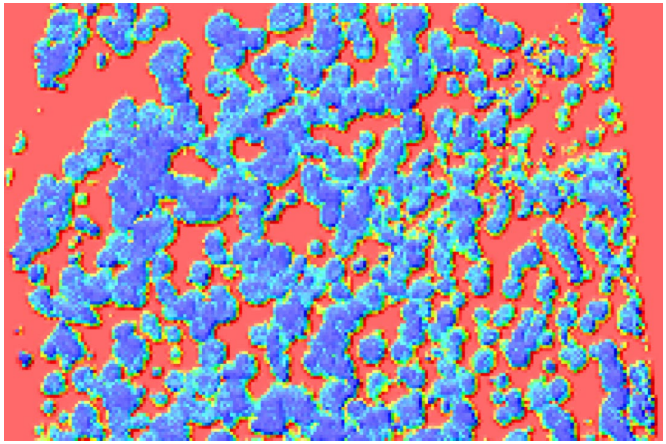
Trunk Cutting

Standing Tree Volume

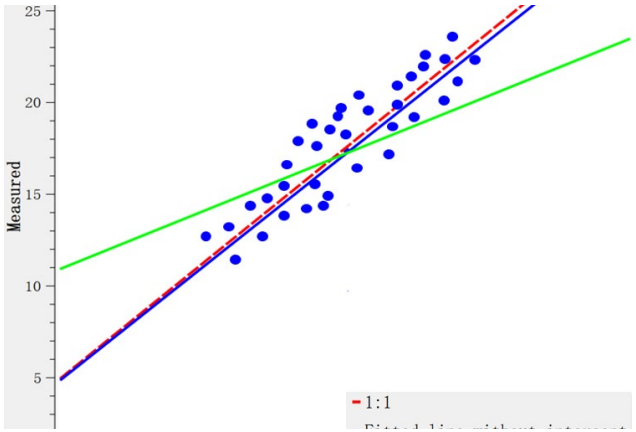
Tree Model (70 Built-in Species)

Position	Height(m)	DBH(m)	CrownDiameter(m)	TrunkVolume(r
(X, Y, Z)	10.6	0.198	6.2	0.10956

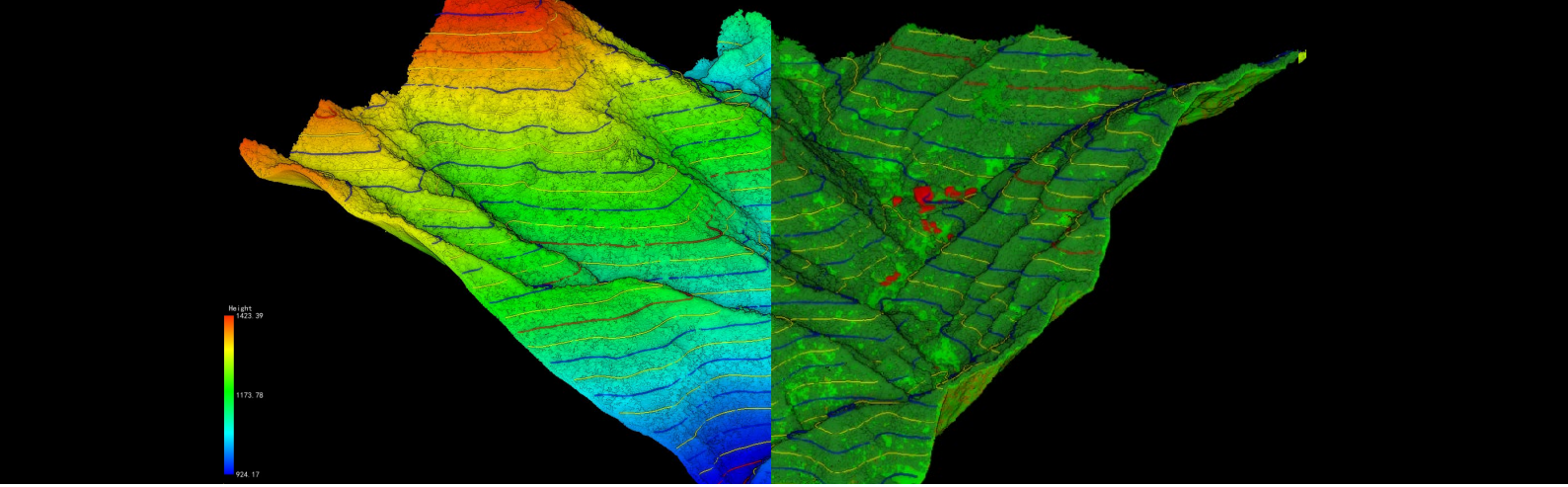
Individual Tree Report



Forest Metrics



Regression Analysis



Surveying and Mapping 03

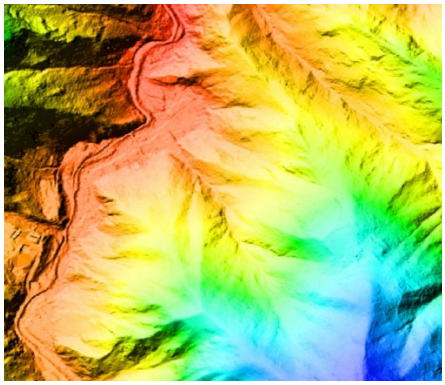
LiDAR can penetrate the canopy to capture sub-canopy terrain features, quickly obtaining large-scale, high-precision terrain point cloud data. LiDAR360 accurately captures ground points and produces a variety of standard terrain products, including DEM, DOM, DSM, and contour lines. It also supports the entire workflow of terrain product production, quality inspection, and finishing with simple and user-friendly interactive tools.

- **Topographic Mapping**

Supports analyzing a wide range of derived results based on terrain data, such as slope, aspect, and annual solar radiation. It can also generate REM (Relative Elevation Model), analyze drainage lines, and identify flood areas, aiding in hydrological applications.

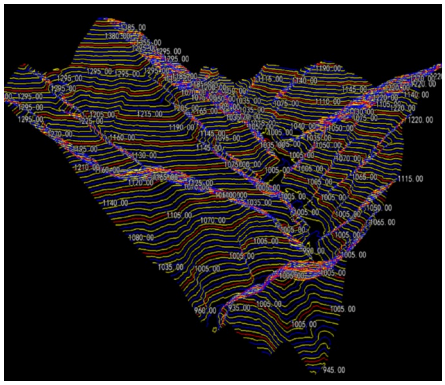
- **Engineering Survey**

Supports calculating earthwork volumes across multiple areas, comparing volume changes, and monitoring construction progress. It also supports cross-sectional analysis of roads and tunnels, calculating overbreak/underbreak volumes, thereby enhancing cost efficiency and effectiveness in engineering surveys.

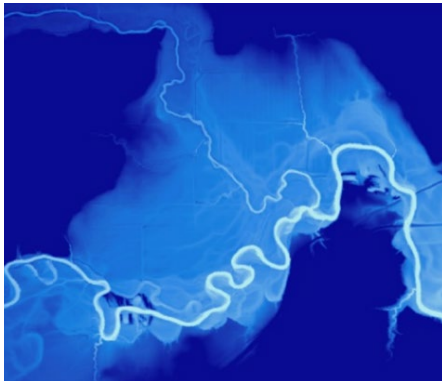


DEM

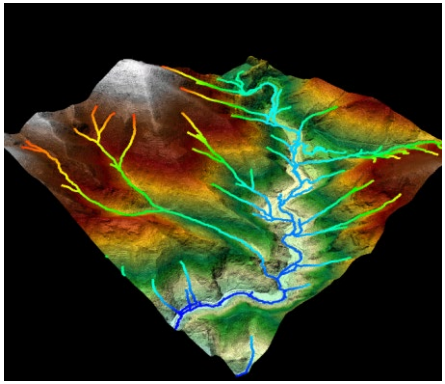
DSM



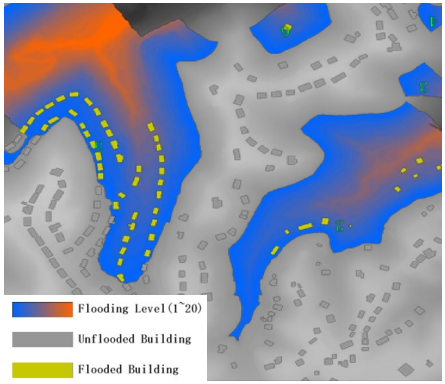
Contour



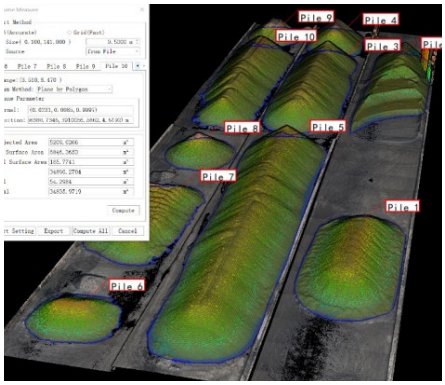
REM



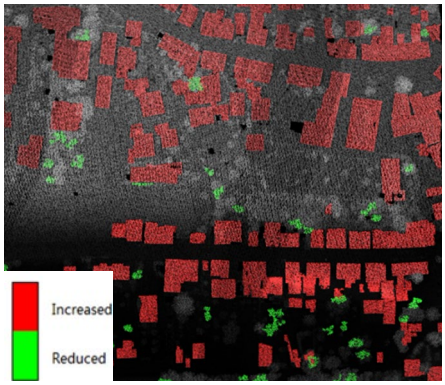
Drainage Analysis



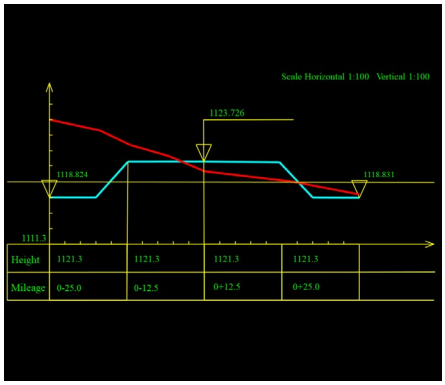
Flood Analysis



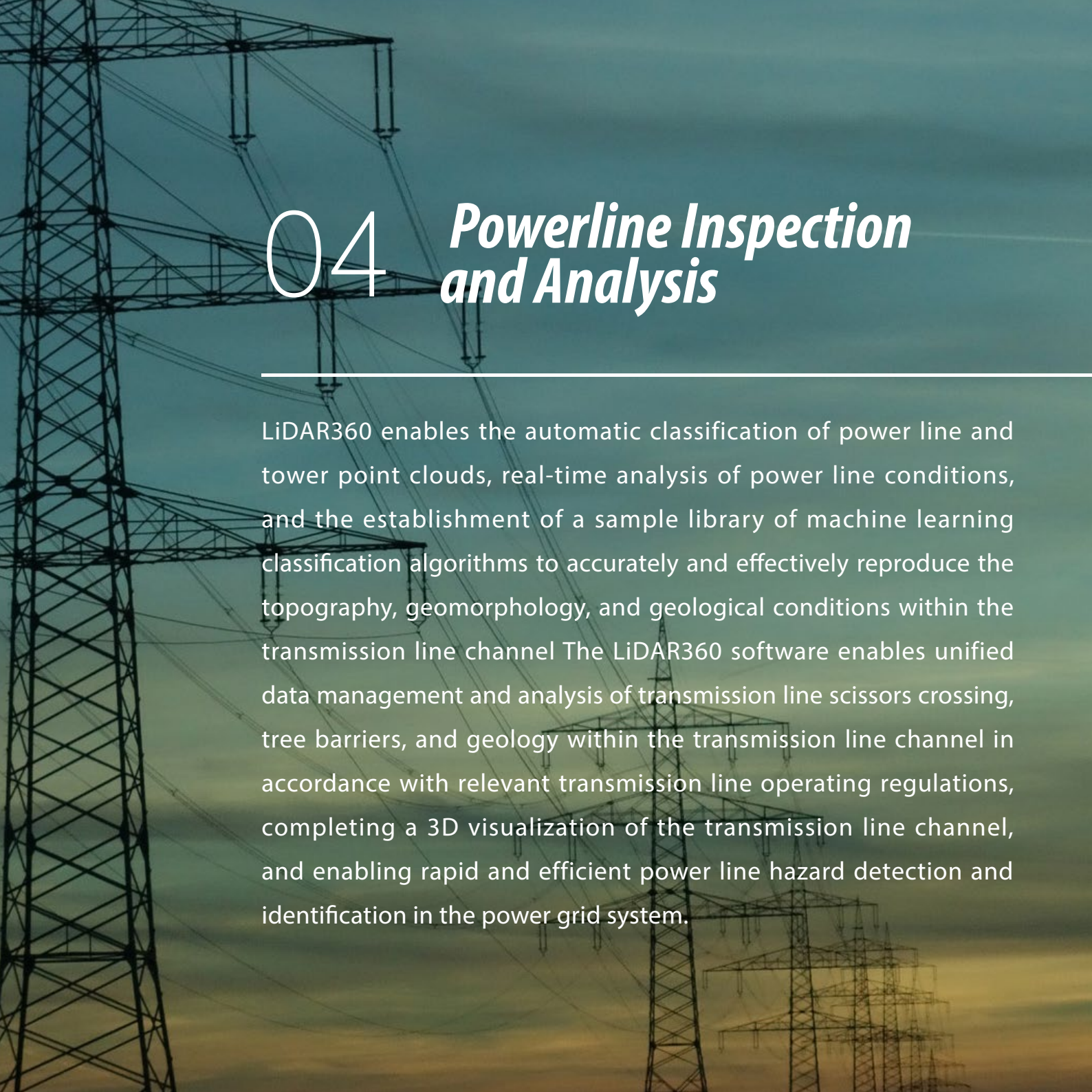
Volume Measurement



Change Detection

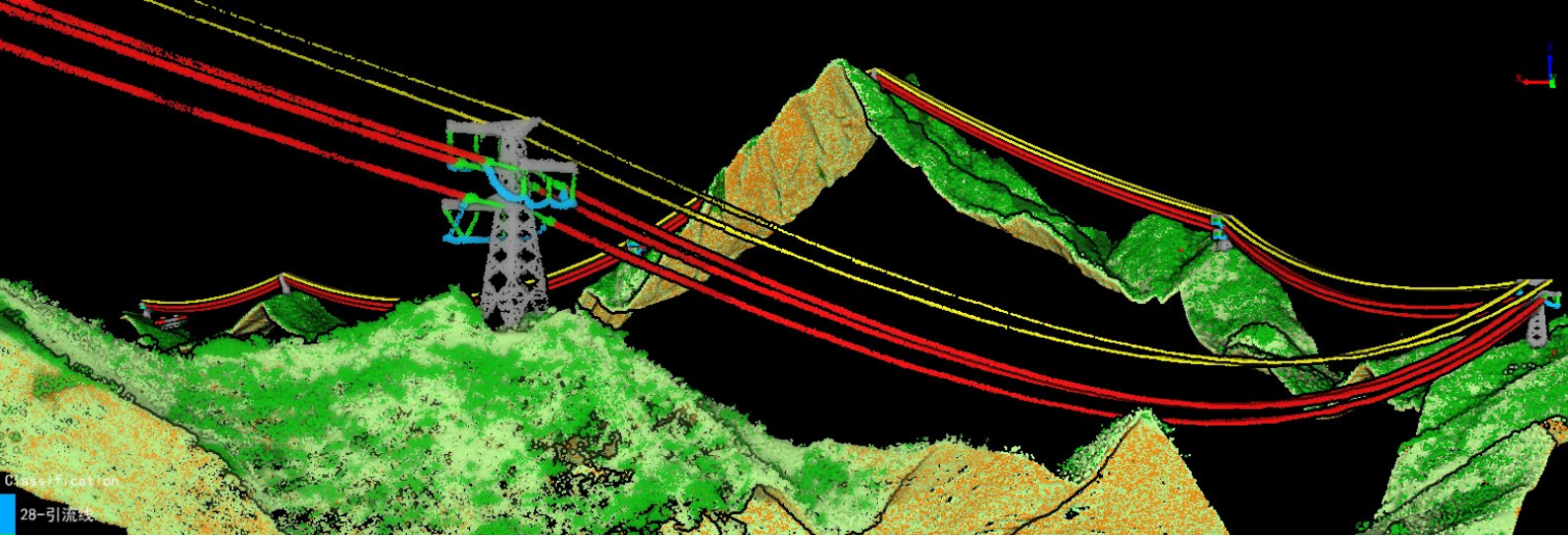


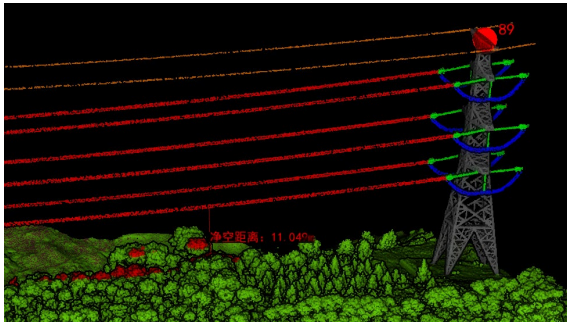
Section Analysis

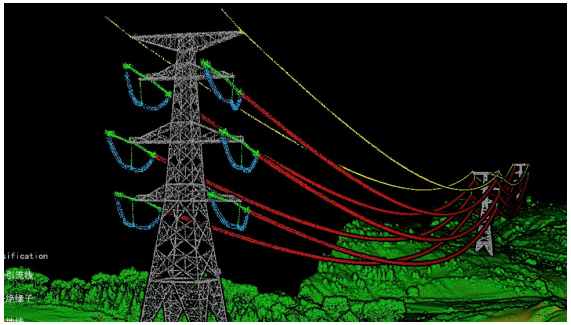


04 Powerline Inspection and Analysis

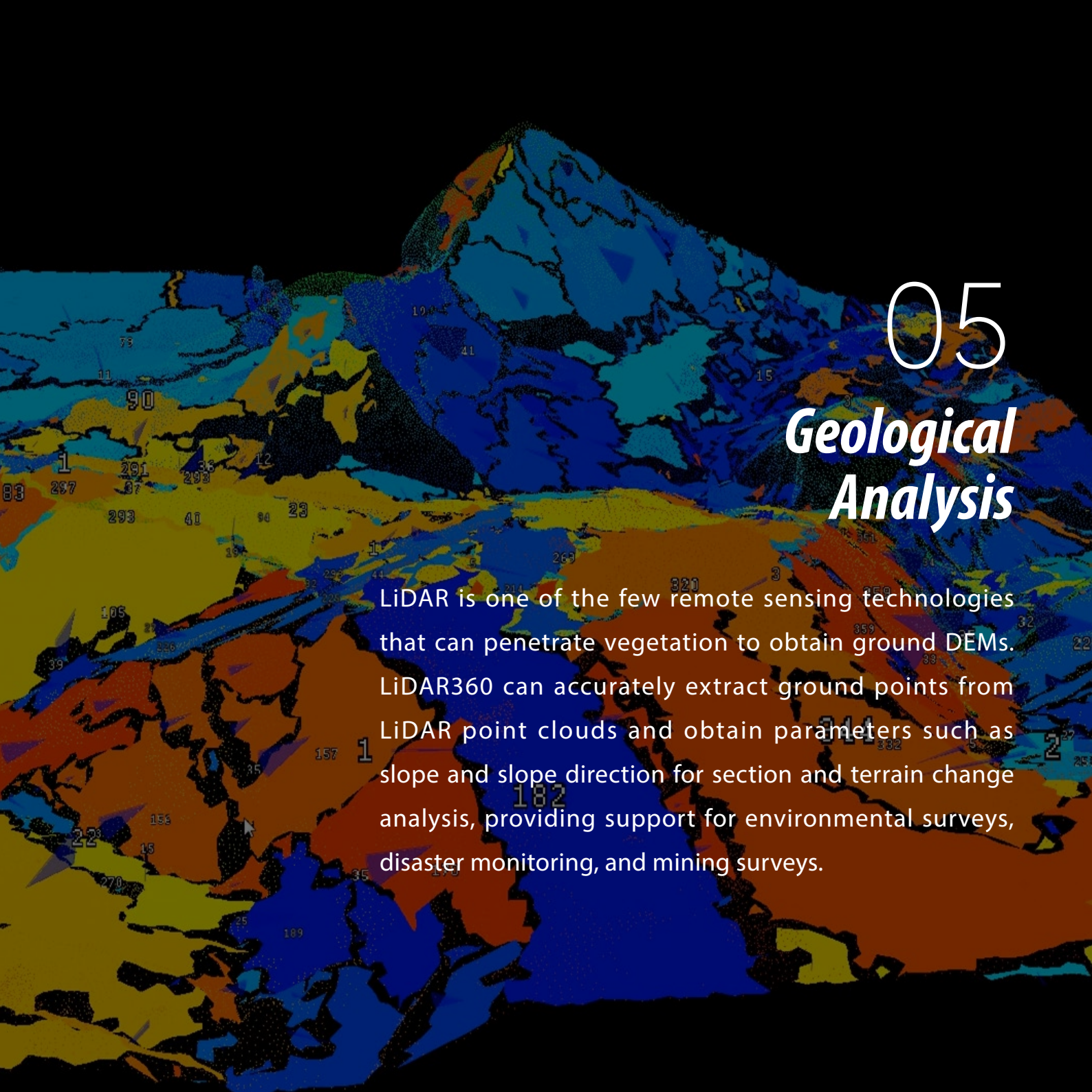
LiDAR360 enables the automatic classification of power line and tower point clouds, real-time analysis of power line conditions, and the establishment of a sample library of machine learning classification algorithms to accurately and effectively reproduce the topography, geomorphology, and geological conditions within the transmission line channel The LiDAR360 software enables unified data management and analysis of transmission line scissors crossing, tree barriers, and geology within the transmission line channel in accordance with relevant transmission line operating regulations, completing a 3D visualization of the transmission line channel, and enabling rapid and efficient power line hazard detection and identification in the power grid system.





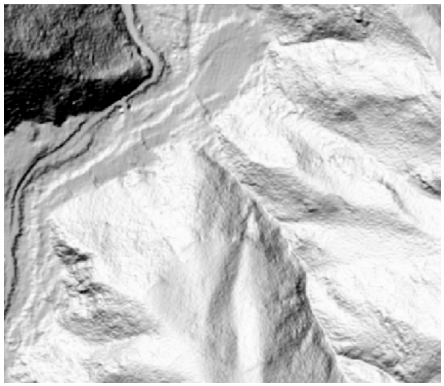


- Highly accurate and precise 3D modeling, identification, and extraction of towers, conductors, tooling components, and underline features.
- Analysis of abnormal conditions within the line channel, such as tree barriers and scissors crossing; rapid detection of dangerous trees, line, and road scissors crossing beyond the transmission line's safe distance; accurate calculation of the number of hidden hazards and dangerous distances within the channel environment; and other situations.
- Supports individual tree segmentation of trees in transmission channels, quickly detects the number, location, height, and crown width of hidden tree hazards, and accurately calculates the felling volume of hidden tree hazards, providing guidance for field work on hazard identification in the power grid industry.

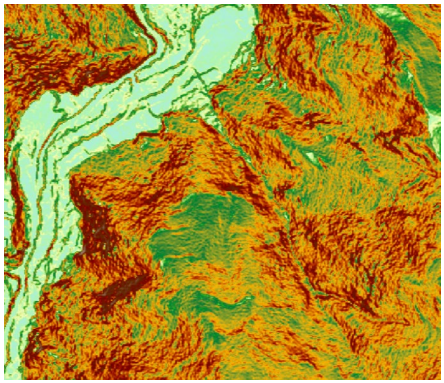


05 Geological Analysis

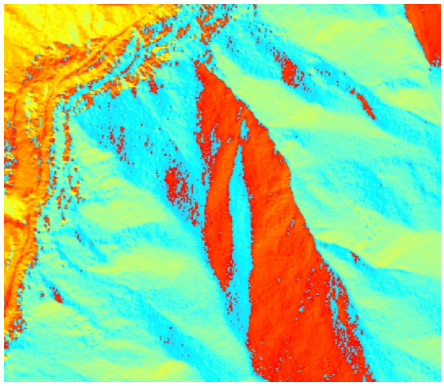
LiDAR is one of the few remote sensing technologies that can penetrate vegetation to obtain ground DEMs. LiDAR360 can accurately extract ground points from LiDAR point clouds and obtain parameters such as slope and slope direction for section and terrain change analysis, providing support for environmental surveys, disaster monitoring, and mining surveys.



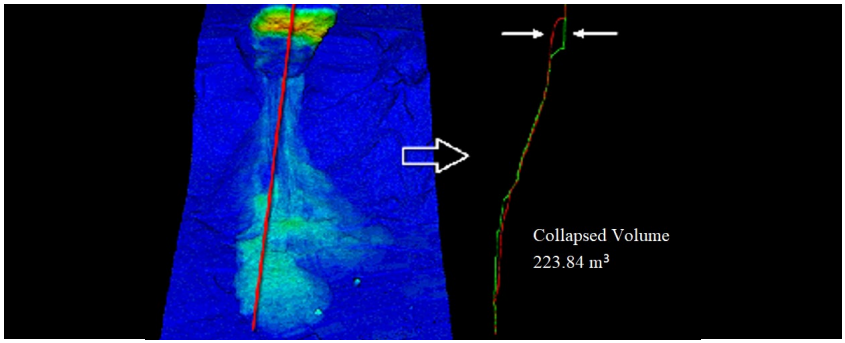
Hillshade



Slope



Aspect



- **Rapid response**

Fast and accurate acquisition of microtopographic features of addressed hazards, such as landslides.

- **Parametric multiplicity**

The extraction of parameters such as surface roughness, slope, and slope direction.

- **Precise extraction**

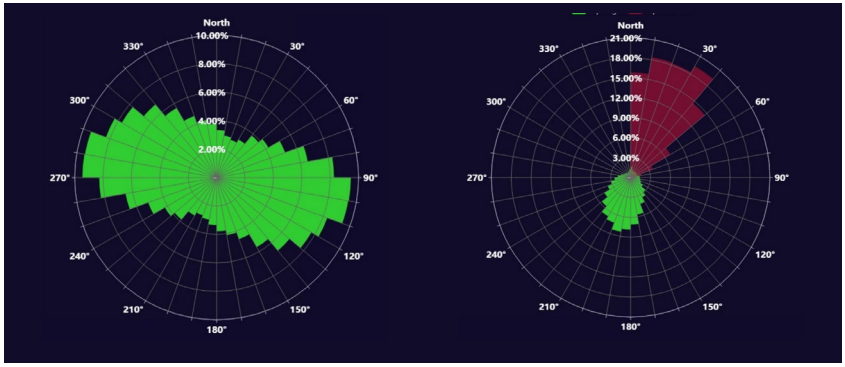
Precise sensing of subtle changes in terrain features over multi-period data for section analysis and structural surface extraction.

- **Early warning**

A disaster warning analysis can be carried out based on the data results.

- **Surface hydrology**

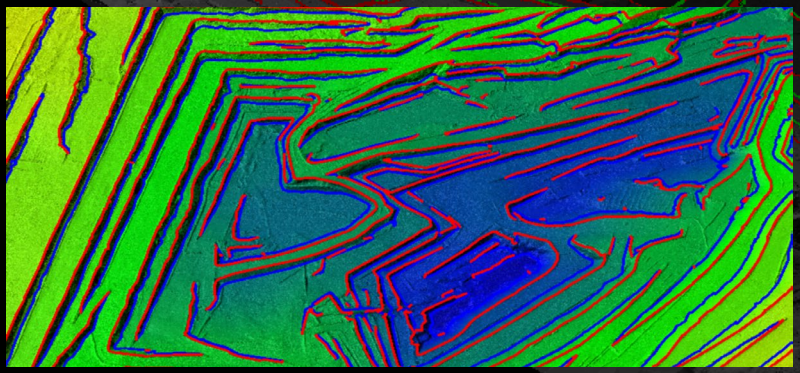
Flow accumulation and depression filling analysis can be carried out.



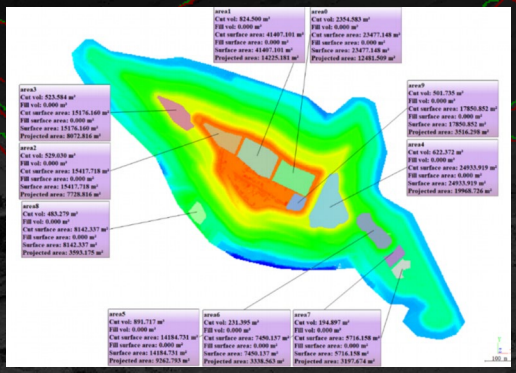
Geographical Rose Diagram

06 Mine Engineering and Safety

Based on the 3D point cloud data obtained from multiple platforms such as ALS, TLS, MLS, BLS LiDAR scanning system, LiDAR360 mining module enables slope line extraction, stockpile volume measurement, and multi-period change analysis of open pit mines, as well as roadway modeling, section analysis, and point cloud classification to meet the needs of applications such as transport step laying, stockpile change monitoring, and construction acceptance, efficiently supporting mining production.

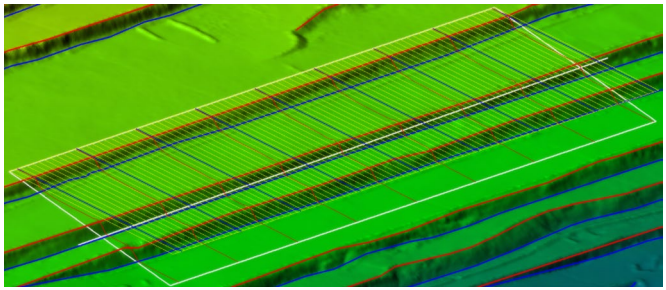


Extract Crests and Toes

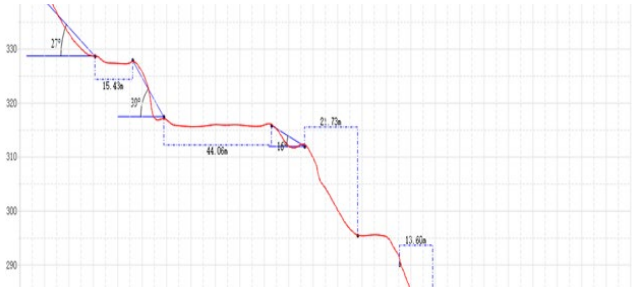


Volume Change Analysis

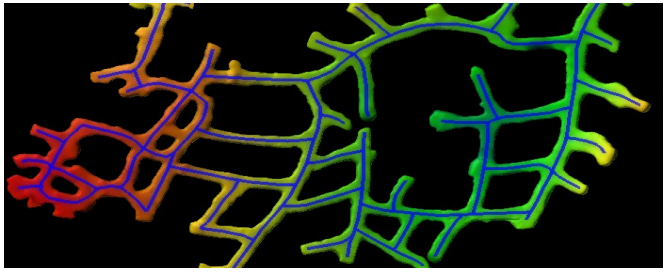
- Automatically model open-pit mines, extract crests and toes line, create stripping plan maps, and analyze Inter-Ramp Compliance.
- Monitor volume change areas and calculate earthwork volume changes.
- For mine tunnels, perform high-precision automatic modeling and provide various semi-automatic optimization tools.
- Calculate tunnel volumes, support backfill analysis, extract centerlines, generate tunnel cross-sections, and calculate changes in tunnel morphology and overbreak/underbreak volumes.



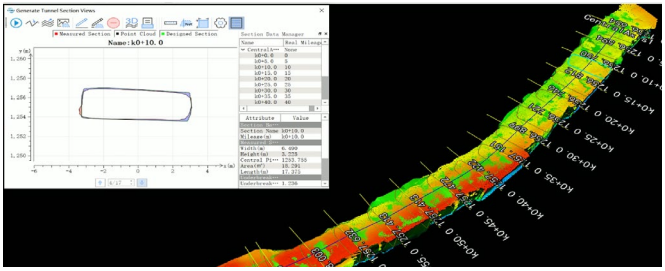
Inter-ramp Compliance



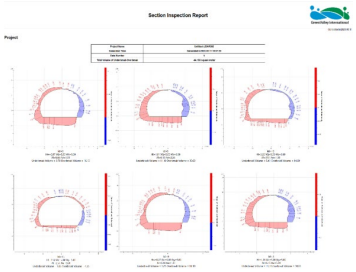
Slop Safety Report



Centerline Extraction



Section Analysis

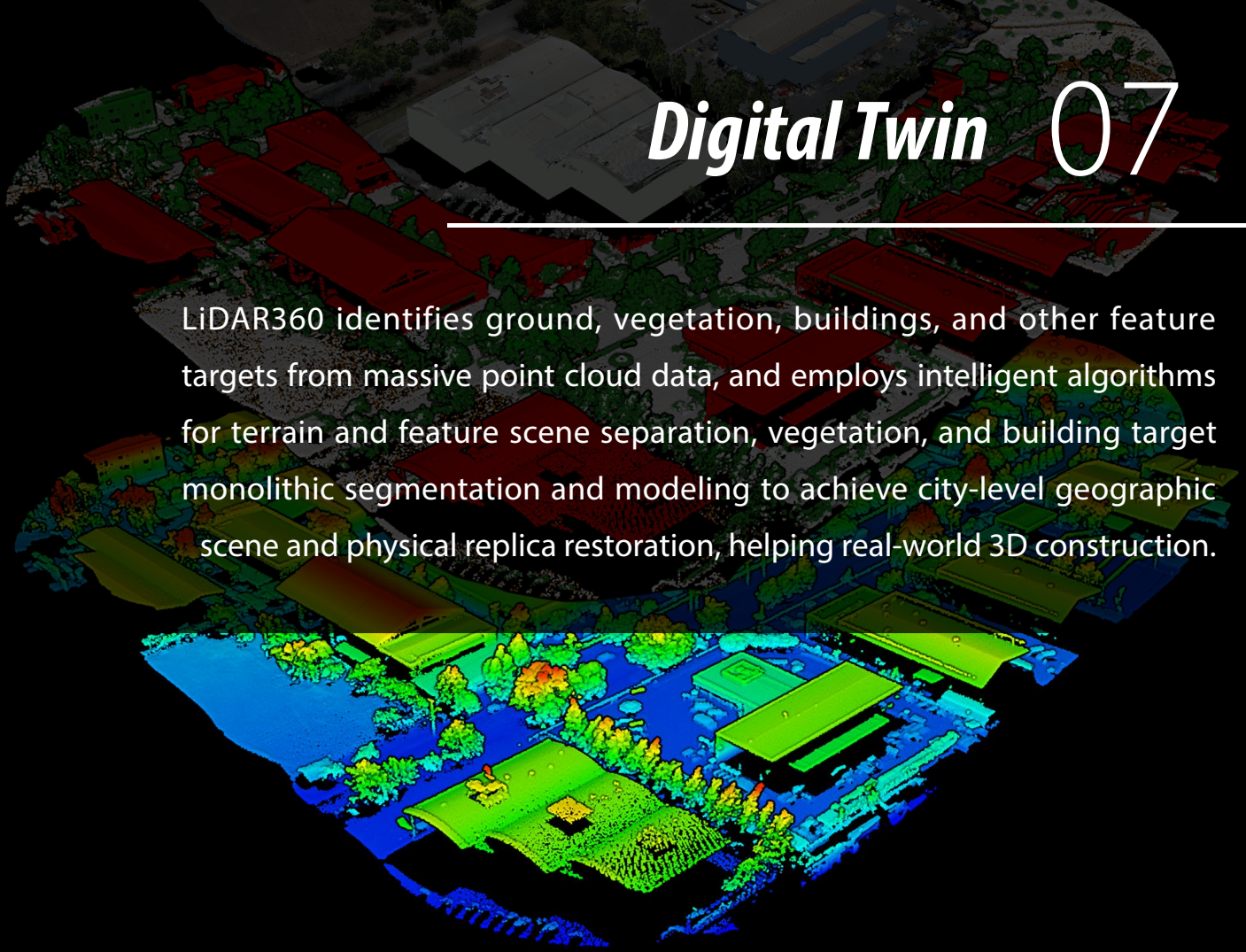


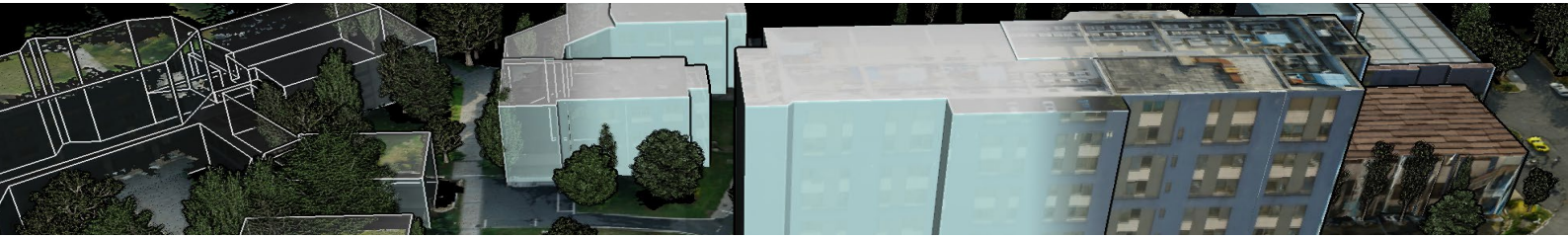
Section Analysis

Tunnel Model (Entirety)

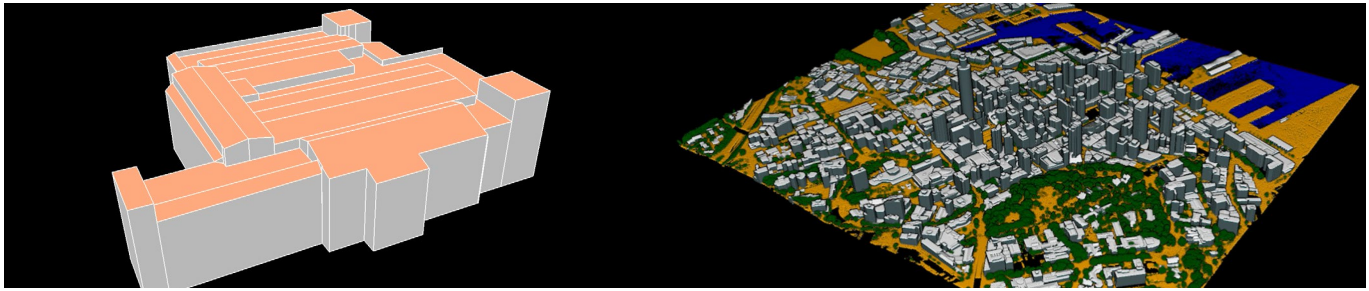
Digital Twin 07

LiDAR360 identifies ground, vegetation, buildings, and other feature targets from massive point cloud data, and employs intelligent algorithms for terrain and feature scene separation, vegetation, and building target monolithic segmentation and modeling to achieve city-level geographic scene and physical replica restoration, helping real-world 3D construction.





- Generate 10,000+ individual building models in 20 minutes, significantly enhancing large-scale scene modeling efficiency.
- Automatically apply textures based on oblique/orthophotos, with built-in model textures and support for custom textures, aiding in digital twin construction.
- Intelligent building model and texture interaction tools ensure users can produce optimal results.
- Automatically calculate eight types of building attributes, including footprint area and base elevation, and inherit 2D vector attributes, supporting filtering, selection, and formula-based calculations of building attributes, efficiently assisting in smart city construction and management.



LOD2 Automatic Modeling

Large-Scale Rapid Modeling

Model Texture Mapping

	BLDG HEIGHT	EAVE HEIGHT	BASE ELEV	ROOF DIR	ROOF AREA	ROOF PERIMETER	FOOTPRINT AREA
1	29.553	22.118	-26.893	17.839	2172.68…	214.488	2146.823
2	6.997	0.989	-4.547	18.449	511.471…	103.066	465.819
3	7.592	5.531	-4.582	19.153	444.500…	97.706	438.296
4	16.188	9.668	-13.548	19.367	3177.89…	248.167	2503.436
5	9.970	5.060	17.950	20.694	703.675…	138.245	702.901
6	6.077	4.891	35.403	22.244	72.0405…	31.415	71.499
7	14.179	3.620	16.291	45.930	1013.85…	144.576	925.127
8	4.250	2.902	27.140	58.066	114.831…	43.122	109.446
9	44.876	32.429	-35.186	60.834	697.885…	100.971	604.379
10	9.246	6.344	-6.276	109.136	1354.19…	175.665	1299.922

Model Attributes Management

www.greenvalleyintl.com info@greenvalleyintl.com
729 Heinz Avenue, Suite 9, Berkeley, CA 94710, USA