**V7.0.0 20231016**

* Preprocessing
  + Add mirror angle correction in trajectory adjustment for livox laser
  + Add hybrid adjustment, improve point cloud accuracy
  + Optimize data registration process, supporting registration of point clouds and models
  + Add automatic trimming for boresight
  + Add Z-value recording in projection coordinates for trajectory
* Data Management
  + Add point cloud RGB brightness and contrast control tool
  + Add smoothing line tool, provide various smooth methods
  + Add point clouds to PLY tool
  + Add building model export to DAE
  + Add smoothing meshes tool
  + Optimize reprojection Tool, supporting to copy projection coordinates and modify, enabling favorites management, and allowing selection of projections from the layer directory tree
  + Optimize boundary extraction, supporting the extraction of inner rings and island-like boundary
  + Optimize extract color from Image tool, supporting coloring based on image projection
  + Optimize point cloud to image tool, enabling the generation of RGB images from multiple attributes
  + Optimize smoothing tool, supporting joint smoothing of multiple files
* Classification
  + Add deep learning urban/rural scene classification.
  + Support multiple segment classification for classify by height above ground
* Terrain
  + Add drainage analysis tool
  + Add construction progress analysis tool
  + Add contour consistency check tool
  + Add contour semi-automatic process tools
    - Add break contour tools
    - Add join contour tools
    - Add filter minimum area tool
    - Add check contour consistency
    - Add Generate elevation annotation point tool
  + Add generate elevation annotation points on contour lines
  + Add generate DOM from aerial projects tool
  + Optimize TIN to DEM tool to solve the problem of external interpolation outside boundary
  + Optimize dimming of mountain shadows
  + Add automatic elevation calculate for vector features in LiTIN editor
  + Section analysis
    - Support tunnel section parameterized design
    - Support generating section based on slope
    - Support distance display for section comparison
    - Support exporting the central line trajectory of tunnel
* Forestry
  + Add biomass estimation and biomass model management
  + Add deep learning-based single individual segmentation to improve tree detection
  + Add forestry attribute custom format to simplify attribute usage
  + CHM segmentation adds east-west and north-south crown width parameter extraction
  + Optimize forest metrics by grid, supporting class selsction
  + Optimize TLS forest metrics, support exporting csv result
  + Optimize TLS seed point editor, support rectangle selection
* Mine
  + Add inter-ramp compliance tool
  + Optimize toes and crests extraction, support auto-separating of toes and crests
  + Optimizing poisson reconstruction with grid density preview
  + Optimize mesh surface reconstruction to improve efficiency and effectiveness
  + Mesh model editor
    - Support both front and back mesh display, and overlay display of points, lines, and surfaces
    - Support mesh selection tools such as lasso, polygon, and rectangle
    - Support mesh back faces selection and invert selection
    - Support mesh visible and through selection
    - Support selection expand and shrink, component selection, and flood selection
    - Support hide selection, select all, and deselect all
    - Support filling all holes and filling single holes
    - Support bridging holes
    - Support mesh smooth
    - Support mesh decimate
* Building
  + Add extracting building footprint from image
  + Add building model registration with image
  + Add projecting textures from photos
  + Add manual image texture mapping, material texture mapping, and material library management
  + Add building attribute management, including adding, deleting, and editing attributes
  + Add automatic calculation of building attributes, including volume, height, and house shape
  + Improve building model editing
    - Add surface division
    - Add surface refitting
    - Add curved surface editing
    - Building split patch supports split by polyline
    - Add file management after deletion
* UAV Processing
  + Supports one-click processing of trajectory adjustment, pos process, cut point cloud by trajectory, cut overlap, smooth points, subsampling, remove outliers, classify ground points, classify by deeep learning
* Vector Editor
  + Add vector entity attribute-linked editing, supporting batch elevation modification
  + Add merge polylines
  + Support gpkg data format
  + Add vector text labeling
  + Add boolean operations for vector entity
  + Add vector intersection
  + Add copy parallel
  + Add extraction of building outlines based on models
  + Optimize layer management, seamlessly aggregating CAD and GIS data
  + Optimize vector display, supporting vector node display settings
  + Optimize reshaping and draw by intersection tool
* Other
  + Add vector display line width setting
  + The directory tree adds trajectory and aerial project management
  + Support selection of attribute fields to display, data saving as new, attribute editing, and attribute filtering
  + The selection and clipping tool supports saving remaining data
  + Volume measurement reporting support and saving the current scene graph
  + The rolling screen tool supports multiple data types such as point clouds, models, vectors, and tables
  + Mesh editing, LiBIM, LiModel, LiTIN, and other editing supports shortcut key settings
  + Support gradual background color setting for rendering scene

**V6.0.6 20231027**1. Fixed the contour base problem for the generate contour function.   
2.Fixing the issue of initial contour layer recording errors when generating contour lines using big data at the junctions of valleys and peaks in mountainous areas.

**V6.0.5 20230906**

1、Optimizing the quality of DEM/DSM generated by TIN interpolation.  
2、Resolving the discrepancy between contours and annotation points.  
3、Resolving failed selection of region classification and adding breaklines in the TIN window. Resolving inaccurate elevation capture when adding breaklines.  
4、Resolving ineffective classification selection when exporting point cloud as dxf format.  
5、Resolving result missing in deviation analysis when processing massive data.

**V6.0.4 20230525**

1.Added support for saving sub-models when selecting the clipping tools to cut OBJ data, and fixed the problem of loss of accuracy.   
2. Fixed the failure of clipping by polygon, tile by polygon function, and vector file attribute naming.  
3. Fixed incorrect results when building contour extraction function obtained data from files in vector editor.  
4. Fixed the problem of point cloud classification failure in the powerline module.  
5. Fixed the problem that LiModel editor fails to load vector polygons.  
6. Fixed the problem that the TLS coverage result is incorrect.  
7. Fixed the concave boundary generation error of the extract point cloud boundary tool.

**V6.0.3 20230317**

1. Optimize the function of generating contours, the dxf elevation annotations retain three decimal places.  
2. Optimize the normalize by ground points tool, providing two normalization methods.   
3. Fix the data display problem for high resolution displays.  
4. Fix the software crashing problem when exporting LAS 1.4 with additional attributes.  
5. Fix incorrect acquisition of scene when multiple point clouds are calculated by the volume measurement tool.  
6. Fix the bug that the clustering function cannot correctly write the clustering results when attribute filtering and statistical information are not selected.  
7. Fix the problem that the command line calling the batch processing function cannot be used normally.   
8. Fix the Generate DOM tool problem when importing non-default coordinate system from LiGeo projects.   
9. Fix the incorrect calculation problem of the TLS Gap Fraction tool.

**V6.0.2 20230113**  
1. Added more support to data import formats for the batch processing tool including PCD, PLY, ASCII, and E57 point cloud formats.   
2. Reproject tool supports deletion of user-defined projected coordinate systems.   
3. Added support for applying GeoID when importing trajectory.   
4. Fixed the problem that the classify low points tool fails to run.   
5. Fixed the problem of failure when converting multiple point clouds to dxf.  
6. Fixed the data display problem on high-resolution monitors.   
7. Fixed the display problem when clicking the measurement label of the model file.   
8. Fixed the display problem when editing seed points under profile view.

**V6.0.1 20221216**  
1. When generating tif files such as DEM\DSM\DOM, added the TFW file for generating image coordinate information.  
2. The East-West and North-South crown diameter parameters are added to CHM tree segmentation results.   
3. Fixed the problem that the source coordinates are set incorrectly when the image range is inconsistent with the point cloud range when generating DOM.  
4. Fixed the problem that the trajectory adjustment fails due to the lack of files when reading the ligeo project for multiple flight adjustments.  
5. Fixed the problem of source coordinate accuracy decrease when using the General mode to generate DEM.

**V5.4.3 20221203**  
1. Optimize the function efficiency of point cloud clustering;  
2. Fixed the problem of accidental collapse of point cloud vectors in the mining module calculation method;  
3. Fixed the problem that when the vector editing module is saved as a dxf file, the layer named by multi-byte characters is imported into CAD to display garbled codes.  
4. Fixed the crash problem during batch processing using las point cloud data;

**V5.4.2 20221024**  
1. Improved the processing efficiency of the reprojection function;  
2. Optimize texture mapping, support mixed color assignment of different bit images;  
3. Support osgb model data point measurement;  
4. Fixed the problem of exiting the block editing after selecting the grid fast after the classification editing and block editing;  
5. Fixed the problem that reprojection crashes during batch processing;  
6. Fixed the crash problem in some cases of seven-parameter conversion;

**V5.4.1 20220927**

1. Support external import of Geoid;  
2. Solve the problem of the loss of precision of the vector arc in the section import  
3. Solve the problem of generating DXF format contour line elevation annotation point label unit identification error

**V5.4.0 20220915**

1. Add the function of extracting by additional attributes；  
2. Add the function of segment by attribute；  
3. Volume measurement add the triangulation method for volume measurement, and the volume calculation is more accurate;add volume measurement of solid model;  
4. Projection and Coordinate Transformation add geoid option;support independent selection of horizontal projection and vertical projection;add four parameters and geoid joint conversion;add geoid model fitting;add model data conversion options to the manual rotation and translation and the manual registration tools;  
5. Add the function of classify by additional attributes;  
6. Add model smoothing function;  
7. Vector Editing add point break, line break, merge, delete functions;add Bspline and BezierSpline drawing; add Bspline and BezierSpline shaping;add 2D and 3D vector drawing elevation mode settings;add polyline smoothing tool;add highest and lowest points snapping;  
8. Add the function of manual tree species marker;  
9. Added single-tree attribute settings to support the selection of calculation methods such as tree position and crown width;  
10. Mine Module support automatic extract of toes and crests;support volume change analysis;  
11. Add gallery mode to the common editing tools in the interface, which supports floating display of tools;  
12. The classification class supports 0-255 class selection;  
13. Support 2D and 3D data linkage;  
14. Custom tab settings window supports tool searching;  
15. Data rendering add raster, vector, model, and table data to display by window;display by window supports point cloud, raster, vector, model, table data filtering by value range; add raster data hillshade feature rendering;support data to save the last right-click attribute rendering settings;  
16. Multi-point selection supports coordinate positioning;  
17. Strip alignment supports the use of selected categories for boresight error calculation;  
18. Trajectory adjustment supports the import of multiple trajectories;  
19. Control point report supports import label display and export report format setting;  
20. Point cloud subdivision functions support preview;  
21. Boundary extraction supports extraction to the same vector file;  
22. Classification editing add the semi-automatic classification of buildings and noise points;support 3D editing mode;support joint image editing;support block editing by range, scale and external import range;improve the function of ground point similation;  
23. TLS seed point editing support profile and main window position displaying;add shortcut key for the main window height filter function;profile view window supports range line display;optimize DBH batch extraction function to improve tree recognition accuracy;  
24. Clear TreeID tool supports height filtering;  
25. Optimize the display of geostatistical rose diagram.

LiDAR360V5.3.5 20220615

1. The start mileage parameter of the section analysis function supports the decimal precision setting.   
2. The powerline module supports the importation of tower coordinates in kml format.   
3. Fix the software crash problem when clipping by polygon and checking the options to generate extra polygon files.   
4. Fix the Chinese display problem of 2004 version dxf format files.   
5. Fix the garbled output problem when applying geoid in reprojection from Chinese paths.   
6. Fix the crash problem of the classify by machine learning tool.

**V5.3.4 20220506**

1. Fixed the problem that the calculation results of the control point report are incorrect when the elevation difference between the point clouds and control point coordinates is large.

**V5.3.3 20220429**

1. Fixed the bug that the regression analysis tools do not recognize the Chinese path when writing files.  
2. Fixed the crashing problem of processing big data for raster flow and fill analysis tools.   
3. Fixed the software activation failed problem after the online update.

**V5.3.2 20220427**

1.Fixed the bug of displaying garbled characters in the Chinese interface of the measurement tool units  
2.Fixed the problem that the name of the projection information for exporting data in las1.2 and las1.3 format was incorrectly written

**V5.3.1 20220422**

Added geoid model information in the output window after reprojection, and updated the geoid model library for North America, Japan, and other regions.   
2. Camera roaming supports roaming along the trajectory data from different perspectives.

**V5.3.0 20220414**

1. Added building and vegetation categories based on deep learning  
2. Added DEM edge   
3. Added DEM accuracy evaluation   
4. Added CSF filter  
5. Added vertical stretch display option for the profile view and edit tools.   
6. Profile view tool in classification added simulate ground points and DEM preview functions. Supported selection and edit of multiple blocks of the tiled data.  
7.Color rendering added real-time contour rendering and improve the convenience of rendering point cloud attributes  
8.Ground point classification supports terrain scene selection  
9.Support coordinate and projection transformation during point cloud data import  
10.Manual translation and rotation tools support setting the rotation center  
11.Improve the efficiency of generating contour lines by 2-10 times  
12.Optimize the efficiency of functions such as denoising, smoothing, ground point classification, noise filtering, etc. Support multi-threading and memory resource settings in the options  
13.Optimize the image rendering operation experience and improve the fluency  
14.Added batch processing for TLS forestry module   
15.Solved the problem of shortcut key customization conflict, support unified control

**V5.2.5 2022.02.24**

1. Add the function of importing external vertical datum data on the start page.

2. Improve the generation of DEM/DSM to support standard map production.

3. Fix the errors caused by the use of shaping elements and segmentation tools when adding a new vector data layer.

**V5.2.4 2022.01.27**

1. Optimize the drawing accuracy of the section point cloud grid.

2. Fix the incorrect additional attributes export problem when converting point clouds into other formats in the batch processing function.

3. Fix the problem of incorrect reading and writing of point cloud data in pcd format.

4. Fix the problem that RGB information is not saved when LiData is converted to LAS 1.4.

5. Fix the logic problem of saving editing results in vector editing and the crash problem of saving empty dxf files.

6. Fix the geographic coordinate system and the projected coordinate system conversion failed bug when calculating the seven parameters.

**V5.2.3 2022.01.06**

1. Fix the problem of data corruption in the control point report function.

2. Fix the incorrect offset problem of e57 format point cloud data.

**V5.2.2.0 2021.12.17**

1. Section analysis:

1.1 Import/export reference line supports simultaneous import of centerline and cross-section, and automatic matching them.

1.2 Support automatic matching of annotation information when importing cross-sections in dxf format.

2. Linear regression analysis module, change ordinary linear regression to a more robust multiple regression (Theil-Sen Estimator) and solve the accuracy problem.

3. Solve the calculation error of concave polygon volume measurement, special polygon (such as 8-character polygon) cannot be calculated according to the file volume calculation function.

4. Fix the redo and undo do not work bug during editing in the profile editor.

**V5.2.1.0 2021.12.1**

1. Fix the "show field" crash bug in the right-click menu of vector files.

2. Fix the bug that the viewer status is incorrect in some cases after profile editing.

**V5.2.0.0 -30/11/2021**

1.Breakline

-1.1 Point cloud profile editor supports breakline drawing

-1.2 Improve LiTIN editor breakline drawing

-1.3 Support adding breaklines to DEM and contour lines

2. Add extract water area tool

3. Support point clouds in PCD format

4. Section Analysis

-4.1 Support create section by adding model data

-4.2 Support adding section at any position

-4.3 Optimize create section by point cloud and fix the missing section caused by the missing point cloud

-4.4 Optimize export of section to meet production requirements

5. Optimize projection and coordinate conversion, add support for storage of user-defined conversion models, parameters can be created and applied directly

6. The measurement tool supports unit setting

7. Optimize the efficiency of the control point report function with an average increase of 40%

8. Generate CHM function to support big data processing

9. Strip alignment supports SBET format trajectory data

10. Contour function supports class selection

11. Roaming tool supports pause during roaming

12. Add trial application on start page

13. Point cloud data GPS time conversion supports selecting date for conversion

14. Mutual conversion between shp and kml supports geographic coordinate system

15. Subdivision tool supports buffer setting

16. Support report custom settings

17. Optimize the bit rate of the screen recording tool to provide a defaul value based on the system resolution

**V5.1.4.0 -02/11/2021**

1. Updated Spanish translation;

2. Fixed the bug that the terrain change detection report resource file path is incorrect;

3. Fixed the bug that the contour line generation function does not include projection information when batch processing;

4. When merging data, if the RGB range is inconsistent, it will be unified to the 65535 range.

5. Support export contour to dxf (2004) format.

**V5.1.3.0 -16/09/2021**

1. Added Spanish;

2. Fixed the problem of CHM segmentation crash on some computers;

3. Modify the problem that the reprojection cannot be successfully invocated;

**V5.1.2.0 -09/09/2021**

1. Fixed the problem that the CSV result of the terrain change detection function is not correct;

2. Modify the manual translation and rotation function to import and export the matrix as a world coordinate matrix, add rotation center display;

**V5.1.1.0 -02/09/2021**

Fix the trajectory adjustment failure problem.

**V5.1.0.0 – 24/08/2021**

**- \*\*New Features\*\*：**

\* Add mine module

- Extract tunnel points

- Compute normal vectors

- Triangulation modeling

- Triangulation modeling (poission)

\* Vector editor

- Support 3D vector drawing

- Add tools for shaping elements

- Add split polygon tool

- Add semi-automatic extraction of building outlines

- Add semi-automatic extraction of road shoulders

- Add intersection drawing line

- Add section auxiliary drawing

- Add associated window to assist drawing

- Add selection file editing

- Add temporary draft editing

- Support 3D capture

- Support 3D selection

- Support shortcut key setting

- Support rollback and redo

\* Add the hover mode, support the use of hover mode under measurement point selection

\* Add cutting by straight line

\* Add dividing by polygon

**- \*\*Enhancement\*\*：**

\* Profile editing classification

- Select tool support category settings, to be individually set and recorded

\* Select cutting to support cutting of the triangulation model

\* Tree segmentation point cloud editing supports directory tree control display and hidden

\* Cut by polygon, support inner and outer cutting options

\* Manual translation and rotation support X\Y\Z component progress control

\* Directory tree

- Support right-click to open the folder

- Vector data supports dxf format

**V5.0.13.0- 11/8/ 2021**

1.Added support for GPS time conversion of trajectory data.  
2. Optimize the GPS time conversion method of point cloud data.  
3. Fix the bug that failed to determine week, second, and standard time of GPS time of point cloud data.   
4. Fix the bug that failed to read projection information of LAS data.  
5. Fix the bug of reading failure caused by blank lines in the ASCII format of Ply data.  
6. Fix the problem that failed to activate the software online under certain computer environments.

**V5.0.12.0 -14/7/ 2021**  
1. Fixed the issue that the contour line was crossed because of the large missing ground points   
2. The national standard code of contour line type is written in contour line generation from point cloud.

**V5.0.11.0-7/7/ 2021**

1. Fixed errors in the operating environment of ALS forest regression analysis.

2. Fixed errors of incorrect echo reading of las file.

**V5.0.10.0 – 1/7/2021**

1. Fix the crash of ToolBox search function.

2. Fix software crash caused by reading wrong PLY file.

3. Adjustment of the dxf file exported by the section analysis.

**V5.0.9.0-17/6/ 2021**

1. Fix the problematic default parameters of the "Remove Outliers" tool.   
2. Add the options of generating cross-section profiles at the corner point and the endpoint.   
3. Fix the point cloud misalignment problem caused by the loss of accuracy in reading the dxf file.   
4. Fix the display problem when filtering seed points in ALS Seed Point Editor.  
5. Fix the parameter setting window display problem when editing the profile.  
**V5.0.8.0 -2/6/ 2021**

Modify the projection library environment issues and License expiration issues

**v5.0.7 – 28/5/2021**

Bugs Fixed:

Fixed the bug that CRS reprojection custom geoid model failed

**v5.0.6 – 24/5/2021**

Bugs Fixed:

Optimize the efficiency of CHM segmentation

Fixed the bug that the header of POS and the seed point files was not automatically recognized when being opened

Fixed the bug in TLS seed point editor that seed points were not displayed in the profile view

**v5.0.5 – 6/5/2021**

Bugs Fixed:

Improve the calculation method of volume measurement, and add three-point fitting plane

Fixed the bug of section analysis

**v5.0.4 – 20/4/2021**

Bugs Fixed:

Fixed the bug of exporting LiTower file error

Fixed the bug of getting the most recently used projection information

Fixed the bug that some functions cannot change the output path

**v5.0.3 – 14/4/2021**

Bugs Fixed:

The trajectory adjustment function supports user-defined pos attribute field

Fixed the bug of crashing when exporting to LAS 1.4

Fixed the bug in the coordinate convert tool

Fixed the bug that the point cloud is not displayed in ALS and TLS seed point editor

**v5.0.2 – 8/4/2021**

Bugs Fixed:

Improve the performance of point classification in the profile tool

Improve the Geological module to avoid crashing

**v5.0.1 – 1/4/2021**

Bugs Fixed:

Fixed the crash bug of user defined coordinate projection

Fixed the bug of add and merge point cloud data when loading large amounts of data

Fixed the bug that the pos file information cannot be viewed

Fixed the crash bug of display by additional attributes

Fixed the bug that the seed point cannot be delete in TLS Seed Point Editor

**v5.0 -15/03/2021**

*New Features*

Add geology module

Add flow direction funtion

Add flow accumulation function

Add fill function

Add slope/aspect query function

Add data IO API for software development

Support creating LiData point cloud file

Support reading LiData point cloud file

Support modifying LiData point cloud file

Add powerline module

Add deep learning classification of powerline function

Add danger point detection function

Add customization of the danger point detection

Support danger point visualization

Add point cloud smoothing function

Add trunk extraction function

Add elevation annotation points generation based on contour lines function

Add new format transform tools

shp to kml

kml to shp

Support background grid display in viewers

Support extracting point cloud by Tree ID

Support clear individual tree record and segmentation by Tree ID

Add calculating forest metrics

*Enhancement*

UI

Brand new Ribbon user interface style

Support free dragging of child windows

Support customization of UI pages

Supports automatic hiding of docked window

Support one-click industry application processing

Strip alignment

Add strip adjustment function

Support clipping trajectory by quality and selecting with brush on trajectory

Directory tree

More comprehensive point cloud information display

Support selecting version of LAS file when right-clicking to export

Support right-clicking to add additional attributes of point cloud

Support right-clicking to rename files

Support setting the point size of table data

Expand the projection library to support more projections and geoid

Optimize PCV efficiency and support more point cloud calculations for PCV

Optimize ALS automatic individual tree segmentation

Improve point cloud attribute extension of individual tree, slope and altitude information is added.

Optimize individual tree seed point editing

Improve method of profile selecting

Improve method of adding and deleting seed points

Add viewpoint position and direction for easy positioning of trees

Real-time update of attribute table corresponding to seed point modification

Support undo and redo

Support setting profile view point distance

Optimize individual tree point cloud editing

Improve method of profile selecting

Support creating individual tree by specifying a chosen tree

Support setting profile view point distance

Automatically save configuration

Optimized profile point cloud editing

Improve the efficiency of block editing by more than 50%

Support mouse position tracking in profile window

Support data exporting

Add section comparing analysis function in section analysis

Upgrade LiModel format to solve the problem of coordinate accuracy loss

Reduce the GPU usage rate of point cloud display by 20%

Support multiple calls to the same function in batch processing

Fix the bug when using cross selection and clipping tool simultaneously

**v4.1.5 – 18/11/2020**

Bugs Fixed:

Fixed a bug in calculating forest metrics by polygon

Fixed the bug of the reprojection tool that the reprojection process fails when the value of dZ is customized

Fixed the bug of the TLS forestry module that manually added seed points were not participated in the individual tree segmentation process

**v4.1.4 – 3/11/2020**

Bugs Fixed:

Fixed the bug of Control Point Report

Fixed the error in data display control of directory tree

Fixed the bug in exporting section view in PDF format

Fixed the bug of incorrect display of MultiPolygon vector files

Fixed the bug that profiles cannot be drawn in the ALS seed point editing mode

Fixed the bug that the from data type cannot be chosen in filtering tool under the profile window

Revise the tool of calculating forest metrics by grid by remove the restrictions on the size of X Size and Y Size

Fixed other bugs

**v4.1.3 – 12/8/2020**

Bugs Fixed:

Fixed the bug of using all points for Volume Measurement

Support multi-window mode in the Volume Measurement tool

**v4.1.2 – 3/8/2020**

Bugs Fixed:

Fixed the bug that the attribute of point source ID is lost after converting to .LAS from .LiData

Fixed the bug of volume measurement

Fixed the bug of without displaying data in the drop-list in the Convert LiModel to TIFF

Fixed the bug of generating forest metrics, maximun and minimum file name incorrectly in TIFF

**v4.1.1 – 23/7/2020**

Bugs Fixed:

Fixed the bug of noise filter

Fixed the bug of loss of scan angle accuracy when converting between LiData V1.9 and V2.0

Fixed the bug of loss of projection information when converting from LAS point cloud data in the geographic coordinate to LiData

Fixed the bug of loss of additional attributes after elevation adjustment

**v4.1.0 – 8/6/2020**

New Features:

Add three-point angle measurement

Add registration of UAV and backpack forestry point cloud data

Add individual tree attribute information expansion

Add detection of forest structure changes

Add DBH measurement

Help menu

Add software usage problems and demand feedback channel

Add FAQ, quick start, official website link, etc.

Enhancements:

Optimize the efficiency of loading multiple files

Improve color rendering of point cloud attributes

Additional attribute management

Support deleting

Support component combination rendering

Improve profile editing and classifying

Support grid scale display in profile window

Support directory tree to manage point cloud tiles in memory

Support import boundary of measurement area with SHP file in volume measurement

Improve the efficiency of filtering function and the density of ground points

Support directory tree to manage point cloud tiles in memory in individual tree point cloud editing function

Support combined calculation in forestry metrics

Support extract point cloud by tree ID, support export the extracted point cloud to LAS and LiData format

Support attribute filtering in ALS seed point editing

Improve LiTIN editing, support 3D view editing, and support the setting of starting height of broken line

Add tunnel cross-section in cross-section analysis

Window layout supports multiple layout modes

Newly designed UI icons

**v4.0.9 – 22/6/2020**

Bugs Fixed:

Fixed the bug of software crashing when performing CHM segmentation without projection

Fixed the bug of re-projection failure

**v4.0.8 – 15/5/2020**

Bugs Fixed:

Fixed the bug of generating DSM and contour in batch processing mode

Fixed the bug of displaying control points

Fixed the bug of naming problem for imported DXF files in the function of section analysis

**v4.0.7 – 7/5/2020**

Bugs Fixed:

Fixed the bug of reading ASCII files

Fixed the bug of reprojecting files with geographical coordinates

**v4.0.6 – 28/4/2020**

Bugs Fixed:

Fixed the bug of Remove Outliers crashing

Fixed the bug of Classify by Height Above Ground

**v4.0.5 – 22/4/2020**

Bugs Fixed:

Fixed the bug of failure of Regression Analysis

Fixed the bug of incorrect converion from .LAS to .LiData in batch processing mode

**v4.0.4 – 9/4/2020**

Enhancements:

Improve the function of Statisics of Individual Tree Attributes

Bugs Fixed:

Fixed the bug of Regression Analysis crashing

Fixed the bug of class update in the memory mode

Fixed the bug of Forest Metrics in Batch Process mode

**v4.0.3 – 27/3/2020**

Bugs Fixed:

Fixed the bug of Point Cloud Segmentation from Seed Points in TLS Forest module

Fixed the bug of data missing when opening files in PLY format

**v4.0.2 – 18/3/2020**

Bugs Fixed:

Fixed the crash bugs in the function of Batch Processing including Normalize by DEM, Remove Outliers and Noise Filter

Fixed  the  bug of Leaf  Area  Index  in ALS Forest module

**v4.0.1 – 5/3/2020**

Enhancements:

Added the function of Classify Closeby Points in batch processing

Fixed the bug of Individual Tree Editor crashing

Fixed the bug of Classify Low Points crashing

Fixed the bug of Batch Fitting DBH by Classification

Fixed other minor bugs

**v4.0 – 30/12/2019**

New Features:

Add denormalization tool

Add classify close points tool

Add manual rotation and translation tool

Add convert ASCII to BLH tool

Add individual tree editor tool. Support to create, merge, and delete tree

Add statistics individual tree attributes tool

Add TLS leaf area index tool

Add ALS forestry metrics calculation in give area tools

Add deviation analysis tool for two data of the same area collected in different times.

Add change detection tool

Add transform GPS time tool. Support to transform GPS time between GPS coordinate time and GPS week second

Enhancements:

Support online update checking and installing

Upgrade the version of LiData to 2.0. Support all the features of LAS 1.4 (except the waveform information) and support the additional attribute of the point cloud file

Support the color rendering for all the attributes of point cloud data

Support the rotation of 2D view

Support fast mode and precise mode in volume calculation and providing the information of the measuring area

Support zooming to the layer by double-clicking the file in the directory tree

Support recovering the data association in the same path for the project file path

Support EDL effect in render to file and save to video tools

Support generating automatic alignment report and clearing the data alignment information

Improve the profile editor. Support customizing hot keys. Solve the problem of profile buffer settings

Improve the EDL effects in orthogonal projection

Improve the cross selection tool. Support data clipping when being used with selection tool, or 2D drawing when being used with vector editor.

Improve data interaction experience：

Improve browsing fluency

Support automatically picking the rotation center

Improve point picking experience

Support measuring components in the measurement tools

Support measuring points number in the density measurement tool

Support recording the original Z value in normalization tool

Improve the data formats supported

Support E57 point cloud format

Support additional attributes for LAS, PLY, and ASCII format point cloud files

Support choosing the version of las file when exporting point cloud in las format (las 1.2, las 1.3, and las 1.4)

Support converting version of LiData (LiData 1.9 and LiData 2.0)

Support converting point cloud in Geographic Coordinate System to projected LiData

Improve the calculation method of individual tree crown volume

Improve the efficiency of the calculation of forestry metrics

**v3.2 – 6/6/2019**

New Features：

Add brightness settings tool

Add ICP registration function

Support exporting TIN in DXF format

Add raster statistics tool

Enhancements:

Optimize EDL display effect in profile editing mode

Optimize the ground point filter

Optimize the efficiency and effect of “Classify Buildings” tool

Support rectangular/circular interactive area selection tool in clipping function

Change band calculator to raster calculator; support custom formula

Support hot keys and right-clicking menu in ALS individual tree segmentation editing tool

Support position uncertainty optimization mode in regression analysis

Support corresponding multiple point cloud files to one trajectory in “cut point cloud based on trajectory” tool

Profile editing and classifying：

Add the lasso selection tool

Add the plane detection tool

Support clearing the triangular network already been built

Support setting the size of brush selection tool

Support setting the step length of the profile translation

Optimize the efficiency of triangular network generating

TLS individual tree segmentation editing：

Support ignoring the Z-values of the input seed file

Support right-clicking menu and hot keys

Support hot keys in single tree attributes measuring

Support display of LiBackpack trajectory file

Manual registration：

Support inputting/outputting coordinate transformation matrix

Support the preview of transformation

Raster and table data：

Support color settings

Support highlighting objects when they are selected

Support centralizing the objects when they are double-clicked

Bug Fixed:

Fix the bug that the order of the vector and table data’s attribute table is wrong.

Fix the bug that only the displayed data will be used in “batch extraction DBH” tool

Fix the bug that profile selection will disappear in the main window if users edit point cloud in profile window

**v3.1 – 31/12/2018**

New Features:

Profile edit and classify:

Support block editing and classifying

Support multiple windows selecting and classifying

Add the brush selecting tool

Block editing mode supports to undo/redo

Add the automatic timing/automatic saving function

Add multiple selecting area filter classification/classification setting tools

Support hot key switch function

Block editing mode supports RAM usage warning

Boundary extraction adds convex hull and concave hull mode

Add check for updates function

Enhancements:

Improve the efficiency of LiData generating

Support to recalculate the histogram of point cloud intensity and elevation

Move the rectify to reprojection and transformation module

Multiple point selecting tool supports to customize the extended attributes

Support projected coordinate systems in JGD2011 coordinate system

Support POS files in more formats. Now support POS file with projected coordinates.

Support converting length units for las and LiData files.

**v3.0.1 – 10/12/2018**

New Features:

TLS data editing tools:

Add circle selection tool

Add profile translation tool

Add DBH inspector tool

Enhancements:

Optimize the color rendering for individual tree segmentation.

Optimize the segmentation of the vector boundary of crown in CHM individual tree segmentation.

Support the .shp file in section tool.

Bugs Fixed:

Fix the bugs already known

**v3.0 – 16/10/2018**

New Features：

Save users’ parameter setting as default, prompt the information about each parameter when putting mouse on it

Support the spike-free TIN generation algorithm

Add the random forest regression model

Add the regression predict analyze

Add the Projections and Transformations toolset:

Seven parameters solution

Four parameters solution

Vertical datum transformation

Add noise classification function

Support to convert raster data to LiData

Enhancements：

Improve the ground point filtering algorithm

Improve the accuracy and efficiency of the TLS individual tree segmentation tool

Upgrade the LiTIN format to support saving the corresponding LiDAR point classes in LiTIN data and display LiTIN data by classes

Improve the editing and flattening TIN data in LiTIN format

Tile by range supports buffer setting and vector exporting

Support subdivisions of Graticules

Support to generate multiple files when performing polygon clipping

Support to select RGB range when convert data to las format

**v2.2 – 20/06/2018**

New Features：

Multi-threaded batch processing support

Measurement of individual tree attributes (total height, crown base height, stem straightness, diameter at breast height (DBH), etc.) from TLS data

Enhancements:

Improved regression analysis which allows for the importation of independent variables from external sources

Output elevation and intensity variables as .tif formatted files

Individual tree segmentation from a selected point cloud class

Improved TLS data editing tools that allow users to (1) batch process data to extract DBH measurements and (2) fit DBHs to point clouds selected in the profile view window

Add crown diameters, crown areas, and crown volumes to the outputs of the TLS individual tree segmentation tool

Functionality added to the Section Analysis Tool in the Terrain Module allowing users to now: (1) analyze .dxf formatted files, (2) import more than one file at a time and draw multiple section lines. (3) define a step value to simplify sections. (4) export multiple section files

Output contour feature as 2D polylines (.shp)

Edit for vector dataset attributes

Bugs Fixed:

Tree heights now updated for tree filtering after tree segmentation tool has been run

Projection information of las data can now be read

**v2.1.2 – 24/04/2018**

Enhancements:

Improved batch extraction function for DBH (Diameter at Breast Height)

LiData upgrade

30-day trial for power line module

Bug Fixed:

Strip alignment function

**v2.1.1 – 08/04/2018**

Enhancements:

Supports LAZ/LAS 1.4 file formats

Recognize intensity information with ply data

**v2.1 – 05/02/2018**

New Features:

Automatic calculation of flight strips matching parameters

Median ground point clouds classification

Supervised classification based on machine learning

Support to revise ground point filtering results of a defined region

Support cross section analysis

Support vector editing

Support selected region extends from both end in profile viewer

Support point cloud partitioning based on the number of points

Support to generate TIF images with projection information

Enhancements:

Improved DEM/DSM interpolation algorithm

Improved the efficiency of generating contour lines

Improved the efficiency of individual tree segmentation algorithm(individual tree segmentation from point cloud and individual tree segmentation based on seed point)

Supports richer terrain product formats, including a new ASC format for raster data and a new DXF format for the contour line

Bugs Fixed:

De-redundant function

Multipoint selection

Classification by attribute

**v2.0 – 30/10/2017**

New Features:

New License Key: The software could be activated by month or by module

Forest Module (divided to ALS module and TLS module):

ALS Module:

Seeds generation algorithm: generate segmentation seed layer based on CHM, Point Cloud Segmentation and Layer Stacking

Seeds edition: add/delete seeds,select seeds and segment individual tree based on seeds

Batch-processed segmentation based on input seed layer

TLS Module:

Ground Classification using TLS data

Batch-processed segmentation based on input seed layer

Calculate DBH of tree

Generate and edit segmentation seed layer

Classification Module:

Improve performance of ground points filter algorithm

Classification for key feature points. By identifying the key surface points, this allows the down-sampling of relatively flat areas thus improving processing efficiency without sacrificing quality

More user input parameters and options

Power Line Module:

Create vector output for power line and tower classifications

Real-time measurement of the distances from any given point to the closest power line and tower

Set point cloud display point size for individual layers

Automatically identify point cloud center point and set it as rotation center

Improved the visual effects of TIN

Display shapefile layer attribute table

Identify and locate the corresponding individual tree in the viewer by double-clicking a row in the segmentation result list table

Cross selection tool supports more accurate adjustment of the boundingbox

Display parameter in LOG viewer. The LOG file still stays at system’s TEMP folder

Support information collection when the software crashes. You can send crash information in the pop up interface to the mailbox.

The cut results for multiple data sources can be saved separately or be merged into a file

**v1.5 – 14/07/2017**

New Features:

Added power line module. The main functions include marking tower position, cutting the point cloud data based on the tower position, automatic classification of power line and tower, dangerous points detection and report generation

Added selection toolbar. It includes polygon selection, rectangle selection, sphere selection, in cut, out cut, save cut and cancel selection

Added editing point cloud classification with real-time TIN

Support to merge multiple files into one

Support undo to profile editing and selection function by Ctrl+Z

Enhancements:

CHM segmentation algorithm improvement. Users can adjust more parameters and generate the shape file of tree boundary

Add the residual report to the registration function. Users can choose the points for coordinate transformation

Cross selection result can be export

The parameters setting for batch processing for multiple files and multiple functions can be imported and exported

Improved profile editing efficiency

Users can choose whether to generate minor, basic and major contour when using “point cloud to contour” and “TIN to contour” functions

Add seven parameters transformation for reprojection function

The results of Clip by Circle and Clip by Rectangle can be exported as one file, or save as individual files according to the extent of circle or rectangle

The real-time coordinates in the status bar are more accurate

Improved user experience of navigating

**v1.4 – 31/05/2017**

New Features:

Added “generate TIN”, “TIN edit”, “TIN to Contour”, “TIN to DEM” functions

Added Grid Volume Statistics function

Added “Camera Roam” and “Save to Video functions”

Fix the bug for memory leak when loading .ply data

**v1.3 – 17/04/2017**

New Features:

PLY data import and export added to I/O module

Elevation difference, overlap and density quality reports added to strip adjustment module

Add “Subsampling based on octree” and “point cloud convert to DXF” to data management module

Power line classification

Support for mix and glass coloring modes in rendering

Batch process for multi-files and multi-functions

Geometric correction (support point cloud registration based on points or sphere targets)

Enhancements:

Speed improvements for contour generation based on point cloud

Users can set the properties of minor, basic and major contours for “point cloud to contour”. The elevation attributes can be read

Show the boundary of concave polygon for area measurements

The resolution of surface model is not limited to 0.5m

Bugs Fixed:

Fix the bug of file opening error when there is an invalid file in multiple .csv files

Fix the bug of window flash caused by EDL effect in windows 10

Bug fixed for stepwise regression

Bug fixed for software crash caused by opening old version of LiData

Bug fixed for software crash when opening the point cloud with unstandardized projection

**Lite – 04/02/2017**

Free version of LiDAR360, main functions including data visualization and grid statistics

**v1.1 – 22/12/2016**

New Features:

Software platform update: 2D&3D integration, multiple window linkage, rolling screen, display order changed by drag, cross selection,etc

Strip quality check function

Generate contour lines based on point cloud

Chinese software version

Bug fixed for raster image subdivision and LiModel with texture

**v1.0 – 11/10/2016**

First version release of LiDAR360