GreenValley International

LiDAR360MLS

Point Cloud Feature Intelligent Extraction and Analysis Software

V8.0.0-2024.9.23

Software version upgraded to 8.X

➢ New Features:

- Added Georeferencing Module

    ■ New data georeferencing workflow for easier and clearer processing

    ■ Supported one-click batch processing of LiGrip, LiBackpack and LiMobile data

    ■ Supported the output of high-density point clouds of LiGrip, the point cloud quality and colorization result are more realistic

    ■ Added single or multi-project mobile laser scanning data registration and editing tools

    ■ Added slam loop closure editing tool

    ■ Added SLAM calibration parameter update function

    ■ New data output catalog makes it easier to deliver results

    ■ Added the function of converting georeferencing project into mapping project with one click

    ■ Added the function of organizing multi-georeferencing project into mapping project with one click

- Added Road Scene Module

    ■ Added automatic road modeling function

    ■ Added automatic road facilities modeling function

    ■ Added model texture manager

    ■ Added pavement construction function

Map the World in 3D

- Added road facilities and building single-layer modeling function
- Added road scene import and export
- Added model symbol library import extension function
- Added model selection function
- Added model encoding settings function
- Added element-based data model encoding function
- Added element-based attribute scaling / absolute scaling model function
- Added element-based rotation / horizontal rotation / relative rotation function
- Added model movement and editing function
- Added model export to third-party obj format function

● Asset Extraction

- Added template-based road sign training and inference function
- Added North American road marking extraction model
- Added intensity map generation function
- Added average intensity calculation function
- Added road facilities training function
- Added road facilities detection with custom models
- Added rectangular mode for individual editing

● Road Analysis

- Pavement Damage Analysis
  ◆ Added AI-based road damage detection
  ◆ Added interactive road damage editing
- Road Section Analysis
  ◆ Supported for road section analysis and parameter calculation
  ◆ Added high-precision terrain generation based on cross-sectional key points
  ◆ Added point cloud extraction along cross-section lines
  ◆ Added export of cross-section parameters to vector format

- Road Surface Analysis
  - Added point cloud-based DEM/DSM generation
  - Added TIN-based DEM/DSM generation
- Urban Forestry
  - Added rectangular mode for individual tree editing, with transformations for range, angle, and position
  - Added individual tree point selection feature
  - Added table-based additional attribute assignment feature
  - Added batch processing for visual analysis
- Platform
  - All functions supported units such as feet.
  - Profile
    - Added vector-based cross-section and longitudinal profile functionality
  - Toolbox - Data Management
    - Point Cloud Tools
      - Added point cloud registration tool
      - Added point cloud conversion to COPC
      - Added point cloud conversion to structured E57
      - Added point cloud conversion to PCD
      - Added unit definition function
      - Added projection surface elevation conversion function
      - Added transformation relationship calculation function
      - Added elevation jump function
      - Added elevation adjustment report function
      - Added assign color to points function
      - Added grid statistics function
      - Added image export in orbit format
    - Vector Tools

- ❖ Added vector densify function
- ❖ Added vector weed function
- ❖ Added labeling to annotation conversion function
- ❖ Added JSON to feature conversion function
- ❖ Added feature to JSON conversion function
- ❖ Added KML to feature conversion function
- ❖ Added feature to KML conversion function
- ❖ Added XY table to point conversion function
- ❖ Added XY table to line conversion function
- ❖ Added 3D ASCII file to feature class conversion function
- ❖ Added feature class Z to ASCII conversion function
- ❖ Added attribute-based feature to 3D conversion function
- ❖ Added polygon to line conversion function
- ❖ Added feature vertex to point conversion function
- ❖ Added feature to point conversion function
- ❖ Added feature to line conversion function
- ❖ Added feature to polygon conversion function
- ❖ Added feature to raster conversion function
- ❖ Added point to raster conversion function
- ❖ Added polygon to raster conversion function
- ❖ Added polyline to raster conversion function
- ❖ Added clipping function
- ❖ Added splitting function
- ❖ Added attribute-based splitting function
- ❖ Added selection function
- ❖ Added table filtering function
- ❖ Added overlay analysis tools
- ❖ Added count overlapping features function
- ❖ Added erase function

- ❖ Added identification function
- ❖ Added intersection function
- ❖ Added remove overlaps function
- ❖ Added symmetrical difference function
- ❖ Added union function
- ❖ Added update function
- ❖ Added proximity analysis tools
- ❖ Added buffer function
- ❖ Added graphic buffer function
- ❖ Added multi-ring buffer function
- ❖ Added projection and transformations tools
- ❖ Added projection definition function
- ❖ Added projection function
- ❖ Added batch projection definition function
- ❖ Added batch projection function
- ❖ Added select by attributes function
- ❖ Over 300 built-in functions expanded in the field calculator.
- ❖ Added new python scripting functionality .
- ❖ Added latitude and longitude coordinates function

◆ Raster Tools

- ❖ Added conversion tools
- ❖ Added raster copy function
- ❖ Added raster to ASCII conversion function
- ❖ Added raster to point conversion function
- ❖ Added raster to polyline conversion function
- ❖ Added raster to polygon conversion function
- ❖ Added projection and transformations tools
- ❖ Added projection definition function
- ❖ Added projection function

- ❖ Added batch projection definition function

- ❖ Added batch projection function

◆ Panorama

- ❖ Added label display function

- ❖ Added 3D linkage function

- ❖ Added control settings function for displaying point clouds, vectors, models, and trajectories in the panoramic view

◆ Planar

- ❖ Added label display function

- ❖ Added 3d linkage function

- ❖ Added control settings function for displaying point clouds, vectors, models, and trajectories in the planar view

◆ Raster Image

- ❖ Added raster window display settings

- ❖ Added raster image measurement function

- ❖ Added image labeling function

- ❖ Added mask creation function

- ❖ Added training image deep learning model function

- ❖ Added target detection or segmentation function using trained models

- ❖ Added 3d mapping function

◆ Preprocessing

- ❖ Added conversion of trajectories to vector function

◆ AutoCAD Plugin

- ❖ Added cad plugin, no format conversion required, directly opened files with attribute data

- ❖ Supported attribute query function

- ❖ Supported geographic database import and export function

- ❖ Supported feature class import and export function

❖ Supported raster import function

❖ Supported table import and export function

◆ LiDAR360MLS Share

❖ Added results publishing function, allowing point clouds, images, and vector data to be published for viewing on the web

◆ Display

❖ Added window linkage function

❖ Added rolling screen function

❖ Added go to function

❖ Added 3D mouse function

❖ Added open log file function

➢ Enhancement:

● Platform

■ Optimized export for LAS, E57, and other formats

■ Optimized volume measurement algorithm

■ Optimized vector adjustment function

■ Optimized export of annotation layers, supporting DXF format export

● Asset Extraction

■ Optimized road vector extraction function

■ Optimized object editing function

● Urban Forestry

■ Optimized tree segmentation algorithm

■ Optimized normalization algorithm

■ Optimized tree editing function

■ Optimized thematic map generation function

● Road Analysis

■ Fixed the problem with the calculation of IRI, RDI and other parameters

● Fixed other bugs in the software

Map the World in 3D

V7.2.2-2024.7.10

- Optimized the size of the zoom window of panorama and planar camera.

- Fixed the problem of EXIF export in point cloud without coordinate system.

- Fixed the problem of not displaying images in panorama and planar camera zoom window.

- Fixed a problem with drawing vectors in the image window

- Fixed the problem of group authorization activation

V7.2.1-2024.6.20

- Platform
  - Added support for importing TXT files via right-click on point layers
  - Added a secondary prompt for removal function via right-click on directory tree
  - Optimized efficiency issues with TXT/CSV import
  - Fixed issues with failed imports of third-party vector data
  - Fixed the problem of result file size increase in time-based extraction function
  - Fixed issues with importing multi-station E57 data
  - Fixed abnormal point selection in planar camera calibration
- Slam Module
  - Added the slam's setting parameters information to LOG.TXT under slamprocess
  - Optimized the issue of color breakage when using time-lapse mode (using outdoor mode, color by disatnce)
  - Keep the output parameter of the forestry same with the general mode
  - Fixed the bug with black stripes on the colored pointcloud of some O1-LITE

devices

- Fixed the bug that the application on the login interface in the upper right corner of the software did not respond after clicking it
- Fixed the bug that SLAM processing is stuck due to no data behind the IMU
- Fixed the bug where O1 LITE runs in tunnel mode with immediate errors
- Fixed the bug of incorrect point cloud when GCP function uses small coordinates
- Fixed the bug that causes black stripes when using the H120 backpack
- Fixed the bug that the memory crashes when the device is in a long period of static

- Floor Plan Module
  - Optimized the category setting interface
  - Optimized category naming issues
- Vector Editing
  - Optimized the interaction for reshape line
  - Optimized the interaction for moving vector
- Road Analysis Module
  - Optimized IRI parameter calculation for road cross-sections.
  - Optimized minimum parameter threshold for road damage
  - Fixed issue with exporting DXF for road cross-sections
  - Fixed problem with bridge height limit not displaying measurement values in profile window
  - Fixed crash issue with power line height limit
  - Fixed issue where custom range window was not displaying in clearance analysis
- Urban Forestry Module
  - Added seed point extraction methods for circular and rectangular selections
  - Added the ability to import seed points via CSV
  - Optimized efficiency of large-scale data segmentation

- Optimized efficiency of seed point updates

- Optimized the ability to set parameters that do not update during individual tree parameter calculations

- Fixed coordinate conversion issues with externally imported seed points.

V7.2.0-2024.4.25

- New Features:

  - Supported for LiGrip and LiBackpack data preprocessing

    - Improved the success rate of SLAM calculation.

    - Enhanced the efficiency of SLAM calculation.

    - Ensured consistency between the data collection end and the post-processing end.

    - Optimized point cloud colorization

  - Added Floor Plan Module

    - Added automatic vectorization function for floor plan.

    - Added DXF export function for floor plan vectors.

    - Added one-click export function for blue print.

    - Supported intersecting and perpendicular line drawing models.

    - Supported line intersection、line merging、line breaking and moving.

    - Supported vertices editing.

    - Supported length、area、angle measurement.

  - Facade Survey Module

    - Added point cloud polygonal section unrolling function.

    - Added point cloud curved section unrolling function.

    - Added point cloud curved section unrolling function.

  - Platform

    - Point Cloud Display

      - Added point cloud X-ray rendering.

- Added point cloud surface enhancement rendering.
  - ◆ Added Blur Plates and Faces function for panoramic/planar images.
  - ◆ Added EXIF update function for panoramic/planar images.
  - ◆ Added brightness contrast export functionality for point clouds.
  - ◆ Added pre-trained classification model for railway scenes.
  - ◆ Added section move step adjustment settings.
  - ◆ Support Traditional Chinese language pack.
- ■ Vector Editing
  - ◆ Added line intersection function
  - ◆ Added auto-close mode for right-click on line drawing function.
  - ◆ Added precision setting function for attribute field.
- ■ Urban Forestry Module
  - ◆ Added the function of extracting seed points globally.
- Enhancement：
  - ■ Platform
    - ◆ Fixed the problem of losing DXF layer styles when exporting.
    - ◆ Fixed the failure of exporting vectors from point layers imported via TXT.
  - ■ Element Extraction Module
    - ◆ Optimised the function of railway track detection, support category filtering
    - ◆ Optimised power line detection function, support category filtering
  - ■ Facade Survey Module
    - ◆ Fixed the problem of exporting DXF layer name anomaly.
  - ■ Road Analysis Module
    - ◆ Optimised the calculation results of road longitudinal section parameters
    - ◆ Optimised road damage detection
  - ■ Fixed other bugs

V7.1.1-2024.3.1

- Optimized orthophoto density map export.
- Optimized the import shp from table, supported direct import into points, lines and surfaces, and supported coordinate conversion.
- Optimized track jump detection and repair function
- Fixed the issue of manually editing the label settings in the profiling module.
- Fixed AMD graphics card display issues.
- Fixed imagelist update problem
- Fixed track version reading problem
- Fixed node editing crash problem.
- Fixed other bugs in the software

V7.1.0-2023.12.21

- Added point cloud brightness contrast setting function
- Added screenshot position setting
- Added project organization functionality
- Added import point layers from tables
- Added image file update functionality.
- Added data transformation functionality.
- Added detection and correction for lateral jumps in trajectories
- Added railway detection feature.
- Added functionality to add XYZ to the attribute table.
- Added the ability to export point layers in CSV format.
- Added layer styling with support for styling based on attributes.
- Added functionality for individual tree orientation measurement.
- Added functionality for exporting individual tree reports.

Map the World in 3D

- Optimized volume measurement algorithm, supporting category filtering and calculation based on selected vectors.
- Fixed the issue of not being able to copy when exporting to DXF.
- Optimized software interface, distinguishing between Chinese and English prompts.
- Optimized feature reports, differentiating between Chinese and English reports.
- Fixed the issue of updating imagery data in aerial strip stitching
- Optimized control point correction function, supporting tie points on RGB information
- Optimized point cloud coloring algorithm.
- Optimized functionality for extracting linear features.
- Optimized operations for functions like line-to-point conversion, point-to-line conversion, and surface construction.
- Enhanced interactive operations for functions such as move, parallel copy, etc.
- Expanded the line-to-point conversion function to support converting all nodes of a line vector to a point layer.
- Optimized the algorithm and process for individual tree segmentation.
- Enhanced the functionality for creating thematic maps in ecological landscape analysis, now supporting the independent generation of thematic maps for multiple files.
- Fixed other bugs in the software

V7.0.0-2023.11.04

Software version upgraded to 7.X

➢ Platform
  - Added point cloud data format batch conversion

- Added configurable project templates

- Added export functionality for geojson data format

- Added orthophoto window, supporting display, measurement, and mapping of orthophotos.

- Added multi-window display modes for point cloud data based on different attributes.

- Added Addeditional attributes for trajectories.

- Added a tool for selecting within surfaces.

- Added volume measurement reporting.

- Added volume measurement functionality for two phases.

- Added point cloud reprocessing functionality.

- Added functionality for Addeditional operations on point cloud attributes.

➢ Added Point Cloud Tool Module Added SOR filtering.

- Added noise filtering.

- Added point cloud resampling functionality.

- Added point cloud merging functionality.

- Added functionality to normalize based on ground points.

- Added de-normalization functionality.

- Added point cloud normal calculation functionality.

- Added GPS time conversion functionality.

- Added projection definition functionality.

- Added coordinate transformation functionality.

- Added functionality to extract based on Addeditional attributes.

➢ Preprocessing

- Added colorization functionality for mobile laser scanning point clouds.

➢ Point Cloud Classification and Extraction

- Added classification pre-training models for indoor, outdoor, underground parking garagescene point cloud data obtained by SLAM device.

- Added custom deep learning classification functionality.

- Added plane detection

- Added cylinder detection

- Added classify by cover

- Added region growing functionality.

➢ Feature Extraction

- Supported automatic extraction of all types of road markings

- Supported merge to lane

- Added Pole Seed Point Transformation Functionality.

- Added Pole Seed Point Update Functionality.

- Added Pole Seed Point Editing Functionality.

- Added individual segmentation of cars and buildings functionality.

➢ Vector Editing

- Added image (panoramic, planar, orthophoto) based vector drawing and editing.

- Added radius circle and diameter circle drawing function.

- Added Bezier and B-spline curve drawing modes.

- Added tracking drawing mode.

- Added point-to-line conversion functionality.

- Added line-to-point conversion functionality.

- Added polygon-to-line conversion functionality.

- Added line-to-polygon conversion functionality.

- Added layer interrupt layer function

- Added construction surface function

- Added multi-part to single-part feature

- Added topological edge editing

- Added auxiliary line mode .

- Added field calculator.

- Added object photo database storage .

- Added attribute quality check tool.

- Added geometry quality check tool.

➢ Road Analysis

- Added custom clearance analysis.

- Added intersecting lines clearance analysis .

- Added bridge height limit analysis and analysis report.

- Added urban power distribution line analysis and analysis report .

- Added road damage detection.

- Added pavement condition index(PCI) calculation and report generation.

- Added longitudinal section analysis.

- Added model key point extraction.

- Added road TIN generation.

- Added vehicle collision simulation analysis .

➢ Added Urban Forestry Module

- Added seed point transformation functionality.

- Added seed point update functionality.

- Added seed point editing functionality.

- Added tree height and diameter calculation based on seed points functionality.

- Added measurement of urban tree parameters.

- Added point cloud extraction based on TreeID.

- Added measurement of parameters including DBH, Height, Crown Width, Crown Length, Crown Diameter, Crown Diameter SN, Crown Diameter EW ,CBH, Angle, Area, etc.

- Added ecological landscape thematic map , supporting green viewing ratio(GVR), green volume, sky view factor(SVF), etc

- Added generation of ecological landscape reports.

- Added ecological landscape simulation analysis functionality.

➢ Expanded orthophoto export based on intensity, height and RGB attributes

➢ Optimized image and vector linkage setting

➢ Fixed other bugs in the software

V2.0.5-2023.06.28

● Fixed other bugs in the software

V2.0.4-2023.03.17

● Optimized node editing function, Supported "Z value" and "move to" function for quick modification by picking Z

● Supported various vector selection tools to change the line direction, and Optimized shortcut keys and tips

● Supported Riegl MMS panoramic image file import and Optimized Orbit format

● Supported for South-North crown diameter (SN), East-West crown diameter (EW), crown length (CL) and crown width (CW) in the calculation of individual tree parameters

● Updated trajectory data

● Fixed the problem of Ligeo and LiFuser-BP project opening failure

● Fixed the problem of strip adjustment

● Fixed the problem of invalid horizontal section dragging

● Fixed other bugs in the software

V2.0.3-2023.02.08

● New 2D mode

- Optimized horizontal section function

- Optimized edit vertices function

- Optimized drape to ground function

- Optimized vector objects and the corresponding panoramic image window linkage jumping

- Fixed other bugs in the software

V2.0.2-2022.12.30

- Added new project from template

- Added import gpkg function

- Added road damage report export function

- Added clearance analysis report export function

- Added DXF and KML import and export functions

- Added dashed line batch drawing mode

- Added custom template drawing method for cross walk and parking spot

- Added line smoothing function

- Supported lane line and road edge detection with shortcut keys to switch between semiautomatic and manual modes

- Supported layer renaming

- Supported vector objects and the corresponding panoramic image window linkage jumping

- Fixed other bugs in the software

V2.0.1-12/30/2022

- Optimized the field selection limit when import trajectory

- Optimized the right click menu of the directory tree

- Optimized the interface of vector export function
- Optimized the emptying tips of the directory tree layers
- Fixed the problem of database storage

V2.0.0-2022.11.25

The software was renamed as LiDAR360 MLS

In order to develop the software into a general terrestrial mobile laser scanning（MLS）point cloud processing software platform, the software name was replace with LiDAR360MLS.

➢ New Construction

- Supported drag and drop point cloud to create a new project, and save as to the specified path
- Supported for importing original projects of LiFuser-BP and LiGeo
- Supported point cloud and panoramic data entry software for more than 90% of mobile surveying devices on the market in formats such as Trimble MX9, Leica Pegasus, Orbit Pos, etc.

➢ Database

- Supported database for vector storage
- Supported Addeding, deleting, modifying and querying layers in the database

➢ Basic Platform

- Added point cloud and vector projection conversion function
- Supported point cloud format conversion
- Supported basic tools such as point cloud selection and cropping
- Supported vector data format conversion
- Supported category display 0255 categories
- Supported cross-sectional export of color orthophotos

- Supported for mobile measurement device travel direction arrows and default view settings

➢ Vector Editing

- The right-click menu has been added to the movement function, which Supported moving in a specified distance and direction
- Added arbitrary polygon, circle selection, ball selection, random selection, three-dimensional selection, and cylinder selection
- Added polygon combination and split functions
- Added one-to-many interrupt function

➢ Symbol library and labels

- Added feature symbolization function
  - Supported domestic standard road facility symbol library
  - Supported for common symbol libraries
  - Supported symbol number storage
  - Supported to set symbols for collected point features
  - Supported for modification of symbols
- Added annotation function
  - Supported for annotation layers
  - Supported for annotations to independent objects
  - Supported for annotations to object nodes and edges
  - Supported 3D, elevation annotation
  - Supported annotation style modification
- Added layer label function
  - Supported all layer properties for label display
  - Configurable styles for labels
  - Facilitate operations such as attribute entry
  - New vector line object direction display

➢ Road feature extraction module

- Added the template extraction function of strip features

- Added single segmentation function

- Added individual editing function

- Added single parameter extraction function

- Added AI-based road surface marking recognition function

- Added batch processing function for road surface marking recognition

- Added AI-based batch extraction of road facilities

➢ Point cloud classification

- Supported point cloud deep learning classification

- Supported polygon-based point cloud classification

- Supported point cloud classification based on vector lines

- Supported air noise classification

- Supported subsurface classification

- Supported above ground point classification

- Supported for separating lows

- Supported outlier classification

- Supported proximity point classification

- Supported ground point classification

- Supported classification by attribute

- Supported classify by cluster size

➢ Point cloud extraction

- Supported extraction by category

- Supported extraction by elevation

- Supported extraction by intensity

- Supported to extract by GPS time

- Supported extraction by echo times

➢ Planar camera browsing measurement

- Added planar camera data and point cloud overlay browsing display

- Added planar camera measurement

- Added planar camera calibration

- Added planar camera undistort

➢ Vehicle point cloud preprocessing

- Supported trajectory segmentation

- Supported laser boresight

- Supported track quality check and repair

- Added control point correction function

- Added strip adjust

➢ Road Analysis Module

- Added road damage detection function

- Added headroom analysis function

- Added visual field analysis function

- Added road section analysis function

- Added road cross section parameter extraction function

V1.2-2022.07.23

➢ Added Facade Measurement Module

- Supported vertical vertical

- Supported horizontal guide line drawing

- Supported range line drawing

- Supported taking a section based on a reference/extent line and making adjustments

- Supported the drawing of the basic elements of the facade

- Supported for construction line drawing

- Supported array drawing

- Supported translation and rotation

- Supported for exporting DXF and orthophotos

- Added shortcut key configuration function

- Added layer manager function

- Added combined display function

- Added cross drawing and vertical drawing functions

- Added capture module

➢ Optimization function

- Optimized the drawing method of rectangular traffic signs

V1.1-2022.03.10

➢ Added data block module

- Supported track segmentation

- Supported area block node editing

- Supported region block merging

- Supported point cloud segmentation based on block

- Supported area block selective display

- Supported display and hide of area blocks and their labels

➢ Added more road feature template symbol library

- Supported all types of arrow reticle drawing

- Supported for manhole covers, parking spaces, and drainage grate to be drawn according to templates

- Supported traffic signs to be drawn according to templates

- Supported Chinese and English character drawing

- Supported nonmotor vehicle signs, no Uturn signs are drawn according to the template

➢ Added template matching function

- Supported automatic vectorization matching based on default templates

- Supported custom feature templates and auto-vectorization or manual-vectorization

- ➢ Added multi-type vector editing function
  - Supported for modifying the shape of line features
  - Supported tracing other vectors when drawing vectors
  - Supported point break line, line break line, line break surface
  - Supported vector stickers
- ➢ Added attribute table calculation and predefined functions
  - Added attribute batch filling function
  - Added line feature length calculation function
  - Added character replacement function
- ➢ Added node editing function
  - Supported for individually modifying node coordinate values
  - Supported batch modification of node Z value
- ➢ Added the function of modifying the project
- ➢ Added layer vector copy function
  - Supported copying of elements on the same layer
  - Supported vector geometry copy between different layers

V1.0-2021.09.10

First version release of LiStreet