GreenValley International

LiFuser-BP

Data Processing, Visualization, and Optimization Software for GVI LiBackpack

LiFuser-BP is designed to process, visualize, edit, and refine data collected with GreenValley International's LiBackpack. This user-friendly software contains tools for performing differential GNSS data corrections, optimizing SLAM-based point cloud assembly routines, fusing 2D panoramic imagery and 3D LiDAR data sets, as well as function that clean and align (georeferenced) point clouds. LiFuser-BP ensures that LiBackpack post-data collection workflows can be carried out with ease and efficiency.

— Software Features —

1 Rapid SLAM Data Post-Processing and Reporting

— Built-in differential GNSS (e.g. GPS) data processing module generates accurately georeferenced trajectory data without any third-party software required.

— GNSS trajectory quality reporting & editing tools allow users to eliminate trajectory segments of low accuracy and reduce the negative impact of blocked satellite signals.

— 3D SLAM-based point cloud assembly routines can be optimized to point cloud outputs of the highest accuracy and precision.

— Advanced tightly-coupled SLAM algorithm available for generating highquality point clouds from LiDAR data collected in GNSS-denial environments (e.g. inside buildings, below ground, or under dense forest canopies). Users can select Scanning Environment Modes, such as Forestry, Outdoor, and Indoor etc., to quickly & conveniently configure complicated parameters.

— Point cloud colorization tools can be used to process image data collected from LiBackpack models with integrated panoramic camera designs.

— Batch processing functionalities allow users to load and configure multiple projects before processing them all at once
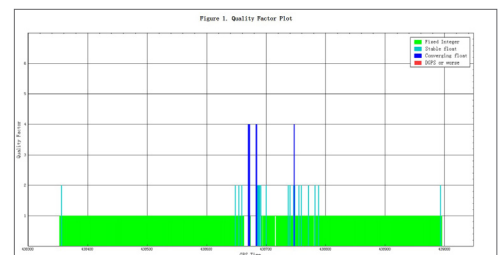

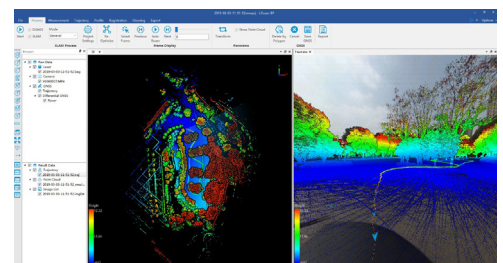Fig. 1 GNSS Trajectory Quality Report

Fig. 2 SLAM-generated Point Cloud

2 Immersive Data Visualization & Roaming

— Display Trajectory, 3D point cloud and 2D panoramic image data simultaneously. An immersive panoramic roaming mode allows for first-person viewing of LiDAR data and imagery.

— Render LiDAR point clouds by height, color (RGB), intensity, as well as other attributes specific to the data set being viewed (e.g. trajectory segment or collection time).
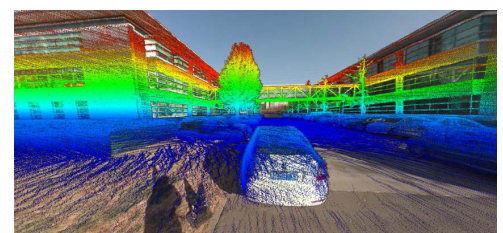

Fig. 3 Immersive Data Visualization & Roaming

3 Precise Point Cloud & Image Measurement

— User-friendly tools are available in LiFuser-BP for measuring 3D point clouds and depth mapped imagery. Geometric attribute measurement tools for finding lengths, areas, angles, heights, and volumes are included.
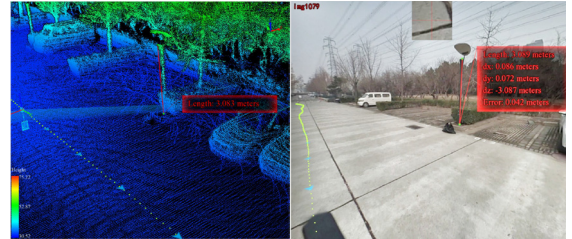

Fig. 4 Direct Point Cloud (left) and
Panoramic Image (right) Measurment Tools

4 Transform and Align Point Clouds

— Easily align partially or fully overlapping point clouds using manual point and registrate target sphere picking tools.
— Interactive tools for manually translating and rotating point clouds into alignment with a reference dataset.
— Fine-tune point cloud alignments using the powerful Iterative Closest Point (ICP) matching feature.
— Load and save manually and/or automatically generated 3D transformation matrix paramater values.
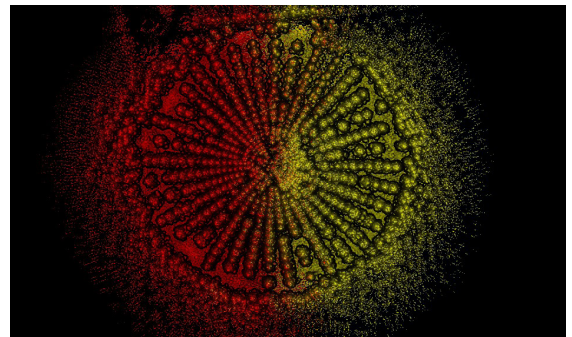

Fig. 5 Align Mulitple Point Cloud Datasets

5 Convenient Data Editing & Cleaning

— Automatically remove (clean) non-target objects (e.g. people, foot and vehicle traffic, etc.) from selected point cloud regions.
— Cut vertical profiles from point clouds and isolate (clip) out specific regions of interest.
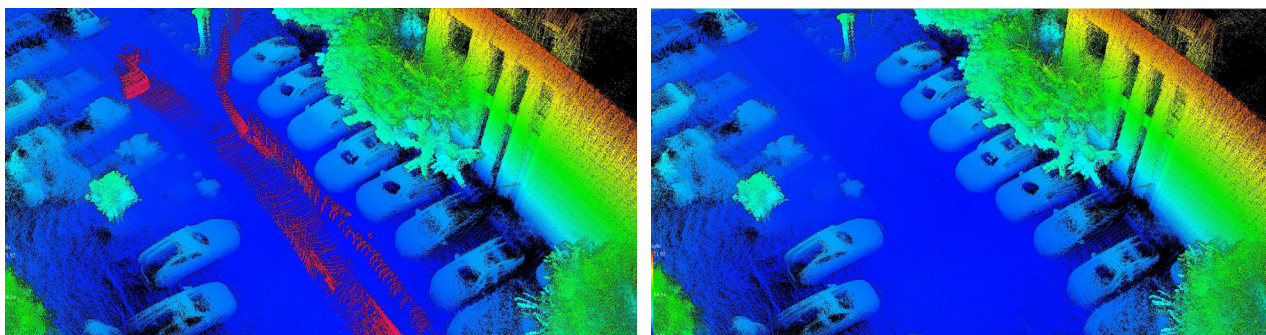— Clip point cloud data with user-selected trajectory (path-of-travel) segments.

Fig. 6 Remove (Clean) Non-Target Objects from Point Clouds