# User Documentation LiDARC

## Introduction

This system provides an interactive platform for uploading, processing, and comparing pointcloud sets with a focus on efficient analysis and clear visual feedback. Users can submit data through a web-based interface, trigger a comparison, and explore the resulting analyses through interactive visualizations. The system is designed to handle computationally intensive tasks in the background, allowing users to continue working without interruption while results are generated asynchronously. Created Results can be viewed and additionally downloaded as a Report.

## User Manual

### Usual Issues

1. File upload only for files with different data and name
   a. e.g. if same content should be uploaded →file has to have a different name (hash over content and filename)
2. Selection of primary file at comparison effects which file the comparison is based on
3. Ordering of files in a folder for comparison is important
   a. e.g. if a folder contains files of same region → should be ordered in a way that the files are next to each other

### Getting started

1. User opens frontend and gets greeted with **LiDARC** *upload files* tab
2. User presses on *Upload Files*
3. User selects wanted files for upload
4. User chooses for multiple file upload
   ○ upload as individual files
   ○ create new Folder for this upload
5. Uploaded Files can later be assigned to a folder → see Managing Uploaded Files

### Managing Uploaded Files

- *Unassigned Files* tab views all non-folder files
  ○ files can be selected through checkbox on the left side
  ○ files can then be assigned to an existing folder or a new folder can be created

- ■ files cannot be assigned to a folder which has been compared previously
- *Comparable Items* tab views all files up for comparison (either in a folder or single files)
- Every file in *Unassigned Files* or *Comparable Items* are up for **deletion**
  - ○ click on *eye* to see file details
  - ○ click *delete file*

## Creating a comparison

1. User can select files for comparison in *Comparable Items* tab with the checkbox on the left side of the files
2. Selected files are viewed on the top of the page
3. User can click *Compare* button
4. This activates the *Comparison Setup* view
   a. User has to select which file is reference file for comparison
      i. eg. if user wants to see comparison based on file A → user select the checkbox next to file A
   b. User types in name of Comparison
   c. User selects checkboxes to select additional metrics for comparison:
      i. *Outlier detection*
         1. select standard deviation sensitivity
      ii. *Individual Statistics Percentile*
         1. Additional selection in details view of selected percentile
         2. can be selected/unselected to view in finished comparison details
         3. This percentile is calculated based on point filtering
            a. eg. if point filtering is 0-95% and user selects individual statistics percentile 99% → comparison selects 0-95% percentiles and user can select/unselect additional 99% based on the 0-95% in finished view
      iii. *Point filtering*
         1. select upper/lower bound of points to consider for comparison
   d. *Define Grid*
      i. *AOI defining* popup opens
         1. User sees the x and y values of the reference file
         2. Coordinates of reference file get transformed according to specified coordinate system and displayed on the right
            a. reference file has blue solid line
            b. other file has dotted red line
         3. User can either change values of x and y
            a. via the value block
            b. drag edges of AOI in map
         4. changes are live updated in the map
         5. define grid width and height dimension for comparison
            a. eg. width: 1 and height: 1 selects all points of files
            b. higher numbers cluster the cells accordingly
   e. User can start comparison by clicking *Start Comparison* button

        f.   sda
5. User gets redirected to *Comparisons* Tab and can view current state of comparison
6. User gets notified if comparison is finished

# Viewing Comparison Results

1. User can see all Comparisons and their current state in the *Comparison* Tab
2. Select specific comparison details by pressing the *eye* on the right side of the comparison
3. Comparison details view for finished comparisons triggers *Visualization Worker*
4. User can see details about the comparison
   a. metadata of comparison
   b. click on *eye* of specific file to view file details
5. On the bottom part of the details page the visualizations start
6. The user can select a range for chunking which triggers the Visualization Worker with selected Chunking Size
   a. This changes the visualizations
      i. eg. chunking Size 1 → each point of comparison result gets visualized
      ii. eg. chunking Size 4 → a block of cells with dimension 4x4 gets visualized as 1x1 cell block with accumulated stats
7. If a individual Statistics Percentile was chosen
   a. User can select/unselect via a small button next to *Comparison Results*
8. Each visualization includes a small *i* (hover) for information about the visualization
9. The heatmap has several buttons to choose settings of heatmaps however the user wishes (explained in navigation guide) next to buttons

# Report Generation

1. Select a comparison details view via the eye on the right side of *Comparison* Tab
2. At the top right of the page the user can press *create Report*
3. Report generation popup opens to:
   a. select name for report
   b. select which visualizations should be included in the report
      i. **Note** that the <u>current state</u> of the visualizations get put into the Report. If heatmaps are not fully loaded → incomplete heatmap in Report
4. Report can be *created & downloaded*
   a. Multiple reports can be created
5. Created reports for this comparison can be directly viewed in the comparison details view or in the *Reports* tab
6. In the Report tab the user can see all reports and can either *Download* report, go to *Comparison* or *Delete* report

## Deleting data

Each *Report*, *Comparison*, *File and Folder* can be deleted
- Report Deletion deletes report
  - can be deleted in *Reports* tab or in the related Comparison's Details View
- Comparison Deletion deletes Comparison and created Reports to this comparison
  - can be deleted on the bottom right of Comparison Details View
- File deletion deletes just the File itself
  - can be deleted in File Details View by clicking on *eye* next to file
  - associated Comparison stay and Details View of Files still possible since metadata is still saved ("Archived" tag)
  - No new comparisons of those Files possible → reupload of File
  - Cannot be deleted if a Comparison is currently processing it
- Folder deletion deletes the Folder and all its contained Files
  - can be deleted in Folder Details View by clicking on *eye* next to Folder
  - associated Comparison stay and Details View of Folder and contained Files still possible since metadata of Folders and Files are still saved ("Archived" tag)
  - No new comparisons of those Folders possible
  - Cannot be deleted if a Comparison is currently processing it
  - After a Folder is compared, included Files cannot be deleted