

ALS Data Processing

Prompt

Obtain raw point cloud data of aerial lidar (ALS) data, create a LAS Dataset, rasterize the point cloud into a digital terrain model, and create a 3D model ready for 3D printing. Choose a relatively small area with interesting local topography, as this will result in a more interesting 3D print.

You will need to find point cloud data from a web source. A few options include:

1. WV Elevation and LiDAR Download Tool (<https://data.wvgis.wvu.edu/elevation/>): aerial lidar for the entire state of West Virginia
2. USGS 3DEP via The National Map (<https://apps.nationalmap.gov/downloader/>): aerial lidar for most of the United States
3. OpenTopography (<https://opentopography.org/>): variety of openly available datasets

Note: Other states, regions, or countries often have portals for downloading ALS data. The list above are just examples.

You can use ArcGIS Pro or CloudCompare to perform the lidar processing. I recommend ArcGIS Pro. You can use the DEMto3D plugin (<https://plugins.qgis.org/plugins/DEMto3D/>) in QGIS to create the file for 3D printing (STL file). You may need to experiment with the settings to obtain the desired result. Adding vertical exaggeration can be useful.

Deliverables

1. Short write-up explaining the source of the lidar data, how you processed it, and why you chose the specific geographic extent
2. STL file ready for 3D printing

Points

Up to 20 points will be assigned based on the following:

1. Quality of write-up of source data, processing methods, and reason for choosing the specific geographic extent
2. STL file should be 3D printable without any major additional manipulations