

LAB 4-5

3D SCANNING SURVEYING WORKFLOW: THE TARGETS APPROACH

In Lab 3, we followed the traditional traverse approach and properly aligned the point clouds from two stations at the time of data acquisition. In this lab, we are going to set up the stations at unknown points and use three targets to register the points clouds. This approach requires post-processing using RealWorks Survey™. To align point clouds from different stations properly, the same set of three targets must be scanned at each of the two adjacent stations. If the project is to be transformed to another coordinate system later, then the coordinates of at least three points in that system must be known (usually these would be the target locations).

Here is a summary of the process (refer to the attached sketch):

1. Equipment and accessories needs:
 - Trimble GX Scanner
 - Laptop computer
 - Trimble battery kit (2 batteries and a cable)
 - Four tripods and four tribraches
 - Three Trimble targets and three Trimble tribrach adapters for the targets.
 - Ethernet Cable
 - Trimble tape-measure
2. Setup three targets with tripods and tribraches. Measure the target heights.
3. Setup the scanner at Station 1 with an unknown point. Perform an Object Scan by selecting part of the object area using the default coordinate system of the scanner. In the default coordinate system, the scanner window faces the scanner north. (To keep the scanner window pointing to the direction you want when it is turned on next time, make sure that the scanner returns to its north position before turning it off.) Scan the three targets and make sure to frame an area large enough so that the white area of the target is fully scanned.
4. Repeat Step 2 at Station 2 using the same PointScape file. When this is done, save it as TargetReg.ppf. Make sure that the targets are not moved.
5. Register the point clouds using RealWorks Survey™. (Procedure will be provided separately.)

Lab 4-5 Report

This is a group report. Each team only needs to submit one copy. The format of the report is as follows;

1. Title page including: a) title of the lab; b) course name and lab number; c) team members; and d) date.
2. Objectives
3. Theoretical background of Point cloud registration
4. Procedures including a) equipment and accessories; b) setup and scanning procedures; and c) target-based registration procedures.
5. Results and discussion
6. Conclusion