



UNIVERSITÉ DE BOURGOGNE

Master IN COMPUTER VISION AND ROBOTICS

PROJECT REPORT - SOFTWARE ENGINEERING

PROJECT TITLE: " 3D Scanner "

Group NAME
Group 2

COORDINATOR
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Progress So Far

This report includes key information about the task that have been done successfully during the last week in addition to the task on which we are currently working on with future plans and backup.

- **Point Registration, ICP:** Till last week, we had completed our research on ICP and had started software implementation of the algorithm. This week, we further worked on coding the ICP algorithm in QT. We used 13 Point Cloud images taken from different angles using Kinect v2 as input to the ICP algorithm. We observed that although the first 5 images of the front side were stitched properly, the algorithm failed to find any correspondence with the images of the back side of the test subject. In order to solve this problem, we will adopt the following approaches:
 - Horizontally Flipping the images of the backside
 - Taking more number of PCD images as input and stitching them

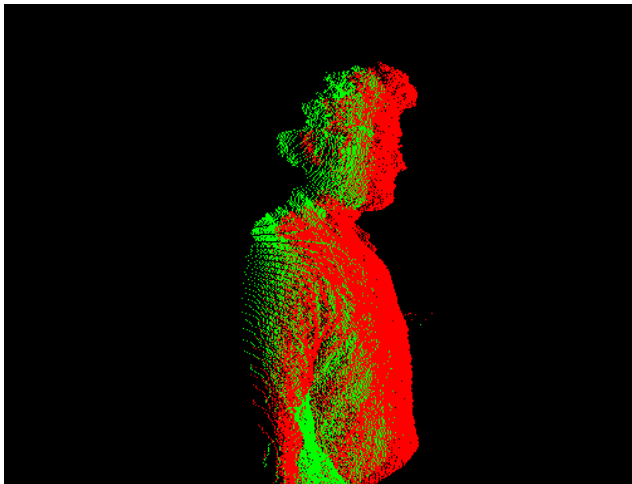


Figure 1: Unstitched Point Clouds

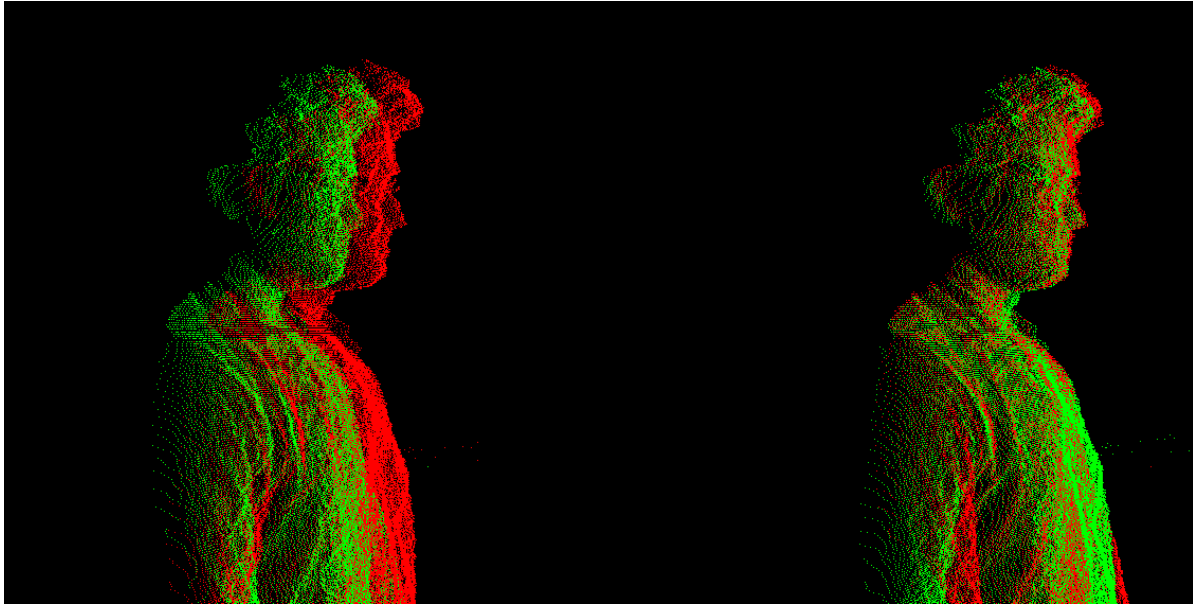


Figure 2: Left: Unstitched PCD Images ; Right: Half-Stitched PCD Images

- **Planar Surface Removal:** Last week, we said that we were working on the code for Planar Surface Removal. This task is still in progress, as portrayed by the Gantt Chart.
- **Compression Algorithm:** As stated last week, the desired task for this week was implementation of the Compression Algorithm in Qt. This week, we have been able to successfully apply a compression algorithm on the Point Cloud Data, courtesy of the inbuilt compression technique inside the ICP algorithm in PCL.
- **Interface of Intel Real Sense R200:** Last week, we stated that we had some difficulties in displaying the point cloud data. Still, we are experiencing problems in streaming and saving data using Qt. This task is also in progress.
- **Gantt Chart:** The updated Gantt Chart is attached with the email.

Tasks for the Following Week

- **Interface of Intel Real Sense R200:** Sort out the abovementioned problems and obtain and save a Point Cloud from the Intel Real Sense and, if possible, perform ICP on the obtained data. Once we are done with the complete interface, we will share the knowledge with rest of the groups.
- **3D Construction:** Begin implementing the Meshing algorithms on the Registered Point Cloud such as Marching Cubes, Marching Triangles, among other triangulation algorithms. One of the groups is researching on 3D construction, and once we complete the implementation of ICP, we will be implementing 3D construction algorithms.
- **ICP:** Solve the minor problems with ICP.
- **Planar Removal:** Sepideh has already compiled research on how to remove a Planar Surface from the Kinect Images. After ICP, in parallel with 3D reconstruction, we will try to implement one of the proposed techniques.
- **To get everyone on the same level of expertise:** We have planned a seminar/tutorial on Thursday, 10th November, 2016 in which everyone will explain comprehensively what they have done to all the members of the group.

GitLab Link:

<https://gitlab.com/Akhtar52/3D-Scanner-VIIA/tree/master>