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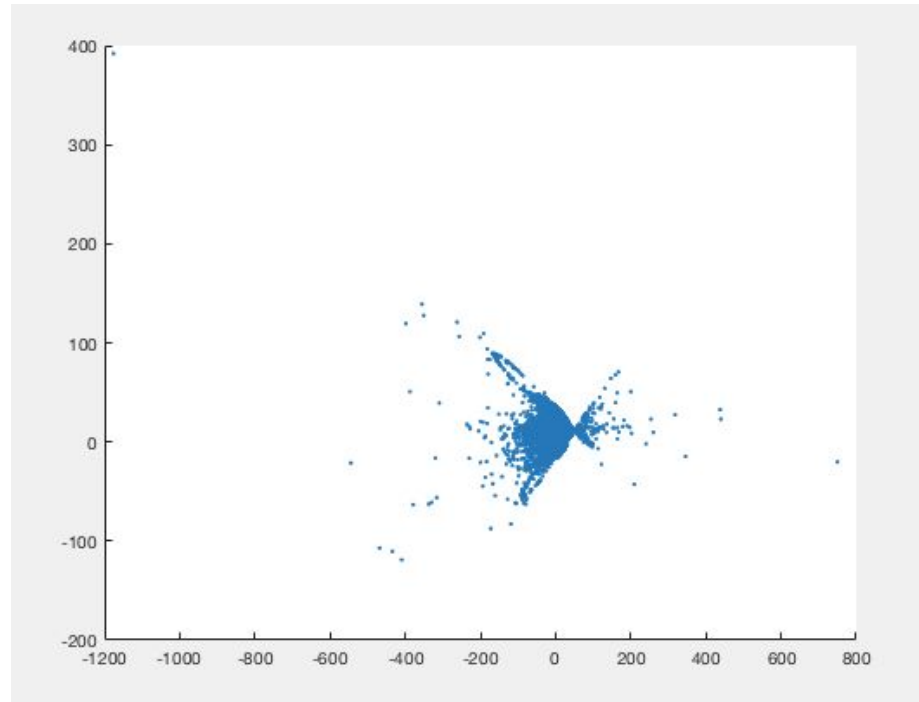
CS 117 Final Project Progress Report

1. Collecting scan data (completed)
    a. I have downloaded manny folder for my scanned data from the google drive that TA provided us on Piazza. Also I have downloaded calib_jpg folder so that I could use it to obtain intrinsic parameters.
2. Setting up toolbox (completed)
    a. Following the directions on Piazza and example page that the professor provided, I have download Matlab calibration toolbox from Matlab. Then, Stereo Camera Calibrator App became available.
3. Stereo Camera Calibration (completed)
    a. First, I have separated the calib_jpg images into two different folders; first the Frame_00 images and then Frame_01 images. Using the Stereo Camera Calibrator tool on Matlab, I have loaded the camera 1 images, and camera 2 images, and set the square size as 27.75 mm, then calibrated them.
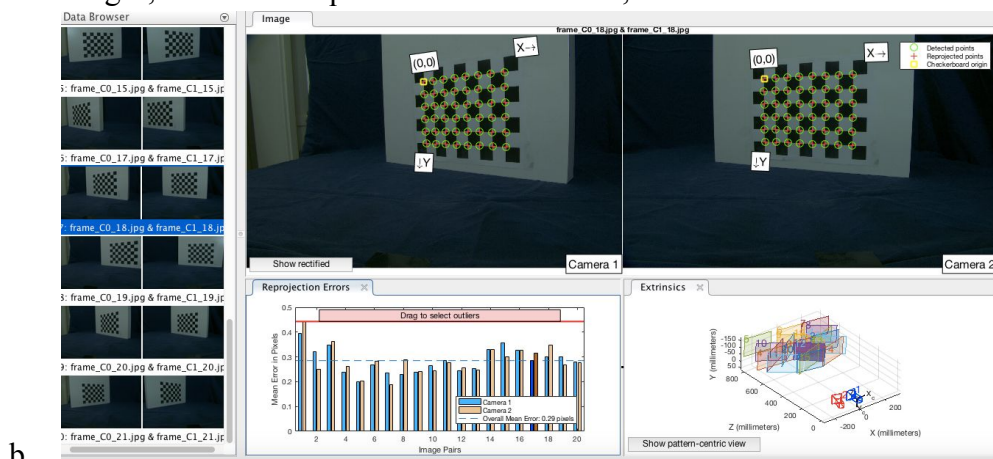
    b.
    c. One confusing part of this was that I wasn't sure whether the frame_00 or frame_01 should be camera 1. But after running it two time with frame_00 as camera 1 and frame_01 as camera 1, I figured out that frame_01 is camera 1 since the error was reduced from 0.28 to 0.23.
4. Mask out background image (in progress)
    a. I am aware that I have to make use of the color image and background image to mask out background pixels before I do triangulation. So I used the color images in the manny image folder. But the I do not think I am getting the correct result, so I am still working on this.
5. Decoding threshold (in progress)
    a. I am aware that I want to experiment with the decoding threshold in order to get the best result, and I am still in the progress as I do not think I am getting the best result.
6. Triangulation (in progress)

a. For every point I triangulate, I am trying to store an RGB value (e.g. the average of the values in the left and right color images), but I am not really getting the right result, so I am working on this.

7. Modify reconstruct and mesh code (in progress)

a. I am aware that I want to modify reconstruct & mesh code provided by Professor to handle more than one scan. For now, I can do one grab folder at a time, but I am trying to iterate through different grab directories and store the reconstruction results in an orderly way.

b.

c.

d.
e. These are the results so far, as I have combined included mask out background image, triangulate, and decoding threshold into reconstruct.m.

8. Mesh cleanup (not started)
   a. I will want to experiment with some modifications to the mesh cleanup to remove bad triangles and vertices.
9. Mesh smoothing (not started)
   a. I will want to smooth the mesh by iterating over each vertex, finding its neighbors in the mesh and moving the 3D location of the vertex towards the average 3D location of its neighbors. I will want to all the meshes associated with different scans into a single coordinate system. I am trying to do this by having the user click on corresponding points in RGB images of two different "grabs", finding the 3D coordinates and then computing the rotation and translation.
10. Poisson reconstruction (not started)
    a. I will want to compute a surface normal associated with each vertex that I can use for the poisson reconstruction. I will want to save out the resulting points/surface normals to a ply file so I can use the poisson surface reconstruction tool.
11. Add color (not started)
    a. I will want to add color to the resulting mesh (either by transferring colors from the individual scans or by texture mapping from the original images).