

Huan-Yang Chang

Team G: Excalibr

Teammates:

Man-ning Chen, Yiqing Cai, Sambuddha Sarkar, Siddharth Raina

EXCALIBR

ILR11

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Individual Progress

1. Robot Integration-Camera setting up

In the last environment setting up, the position of camera was not good enough for collecting the image. Thence, for this time, we would use the laser distance meter, tape measure and level meter to help us to get a better setting up. I thought this manual work could be prevented in the future because the camera would be setting up on the frame rather than the tripod which pose was ambiguous. After the initial setting up, we produced the preliminary experiment to test our setting.(Fig 1)



Fig 1. camera setting up

2. Robot Integration - Environment change

Due to the processing construction, the environment had changed last week.(Fig 2) Now we had the floor. The floor would influence the workspace of the robot and limit the base rotation range.

I had to go back to remodel the simulation environment again to re-configuration the collision module, so I wouldn't generate the invalid path and caused the damage.



Figure 2. The new floor

3. Geometry calibration result

After the image acquisition, we got 80 raw images per camera to conduct the camera calibration. The process time of the camera calibration was quite efficient(~10s) and the mean reprojection error was 0.1698 pixel.(Fig 3. & Fig 4.) The raw image result was meet the goal of

SVE. But we still not removed the sensor noise and conducted the color calibration for the images which might cause the difference for camera calibration. We would perform this result at SVE.

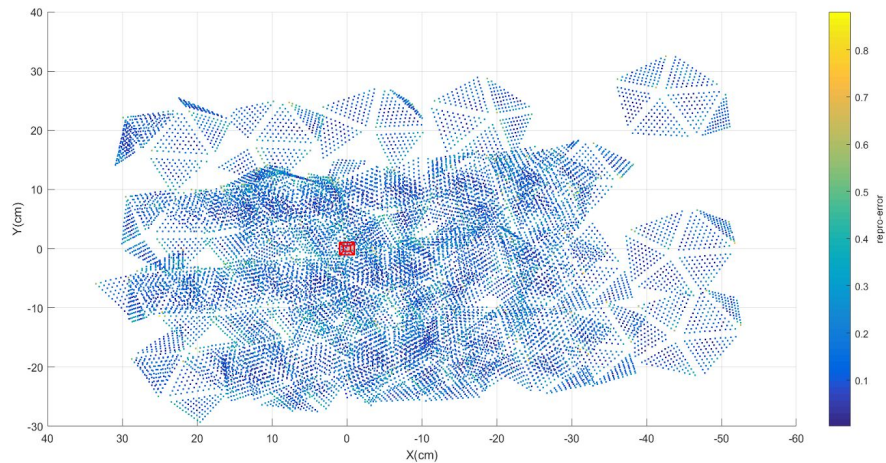


Figure 3. Reprojection point from the calibration target

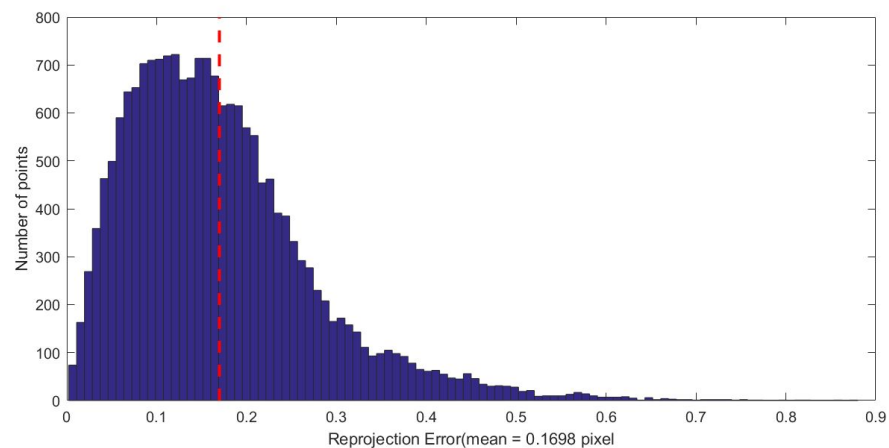


Figure 4. The histogram of reprojection error

Challenges

The construction and the limited schedule of the sponsor would cause the time pressure for our test experiments. We couldn't leave our staff at the dome overnight because there were also other teams doing the testing for other feature. Besides, the construction was still going, we had to stop and wait until the construction was over and we could continue our work. Therefore, we had to plan our test and prepare well to make sure we could finish the experiment on time.

Teamwork

Sid was collecting the camera sensor noise and created the noise calibration function which would be used for image noise removal.

Mandy was working on the color calibration and testing on the different light environment.

Sam was generating the virtual images for the camera calibration validation.

Cece and I work on data collection via the ABB robot arm.

Future Plans

1. Collect image data again and recording the exposure and light condition.
2. Conduct the geometry calibration for raw images and other denoised images.