3D Vision

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Index Terms—**OpenCv, c++, 3D vision**

I. INTRODUCTION

THIS report has a description and explications about the experiences done in the lesson number four and the topic covered is Camera calibration.

II. EXERCISES

A. Disparity map

A disparity map uses the motion difference between a pair of stereo image to represent object distance. We use the stereo extrinsic and intrinsic parameters gotten from the previous assignment to first rectify the imagesas a preprocessing step, then, the `StereoBM` function is used, BM standing for block matching. The results can be seen in image 1
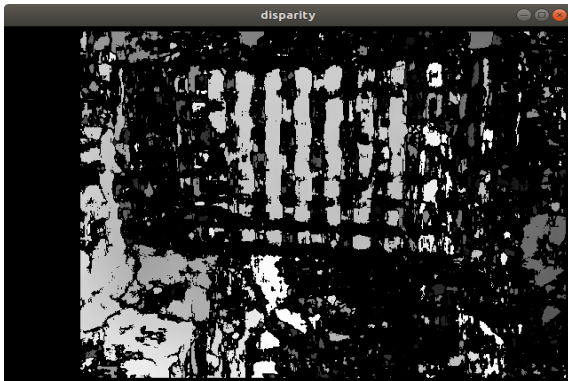

Fig. 1. DisparityMap

Fig. 2. 3D reconstructed points

B. 3D reconstruction

Using the result from the previous exercise, we then use `cvReprojectImageTo3D` which will project the points to a 3D plane, it takes as arguments the disparity map show in 1 and the Q matrix, output of `cvStereoRectify` and is a 4 by 4 disparity-to-depth mapping matrix. The results are then written to a file in xml format using `cvFileStorage`

C. Visualization of point cloud in pcl

Using the coordinate gotten in II-B we use the pcl library to show the obtained coordinates, the results can be seen in