Project 3 Report

**a) Summary**

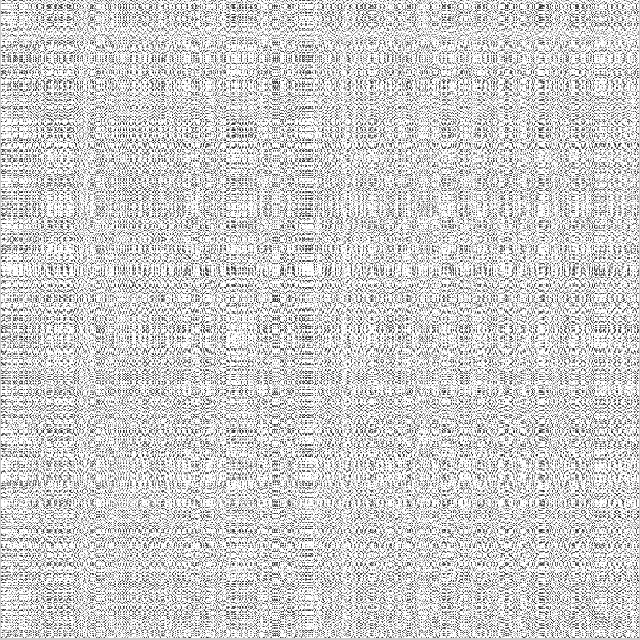
The point of this project was to create a program to conduct stereo reconstruction based on two images taken from slightly different horizontal coordinates. The general purpose of stereo reconstruction is to give the relative depth of the objects in the given images.

**b) Approach**

First the images are loaded in and converted to grayscale. The images then both have disparity space images (DSI) calculated. The DSI is calculated using the normal cross correlation (NCC), and the result is one image where darkness represents dissimilarity. The purpose of the DSI is to calculate minimum cost from the top left corner to the bottom right. Back tracing is then used to determine how to display the combination of images. At this point, all that needs to be completed is occlusion filling, and the process is complete.

**c) Photographic Evidence of Completion.**

DSI



Backtrace



**d) Design Decisions**

The reference pictures were shrunk to 25% normal size to overcome memory errors later down the line. 1-NCC was used as opposed to SSD for the dissimilarity values. This decision was based on the large amount of reference materials provided for a 1-NCC implementation. Occlusion filling was not reached in our implementation, but had it been, we would have used the DP algorithm.

**e) Experimental observations**

The DSI appears to have been constructed properly. As for why it is obscenely large, the DSI presented consists of all DSI’s for all rows. As for the back trace algorithm, it behaved strangely. Current thoughts are that some mistake was made in the loop conditions around line 90 or so. Consequently, observations could not be made

**f) Member Participation Information**

Emerson Lentz:

Wrote the majority of the report and did most of the DSI implementation.

Thomas Dolan:

Did the entirety of back tracing, and was going to do occlusion when we reached it.

General:

Note that both members were in the CS lab working on the project simultaneously. As such, neither member put in more or less work than the other.