HW1:Photometric Stereo

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ReadMe:

To run the code 310552006.py, simply run:

python3 310552006.py

I have arranged the file paths for you.

Outline:

In this report, I will only report how I implement my HW1, because I did not implement any method to enhance my HW1 result.

Implementation explanation:

My code used following self-defined functions to fulfill the job:

1.**Read_LightSource(Name)**
2.Read_Image(Name)
3.reconstruct(name)

I will explain them one by one in order.

1.**Read_LightSource(Name)**

Usage: This function is designed to read in all the light sources, to construct the L matrix.

2.Read_Image(Name)

Usage: This function is designed to read in all the image files, to construct the I matrix

3.reconstruct(name)

Usage: This function is designed to do surface reconstruction and get the depth map z.

Procedure: The whole logic flow follows below steps:

1.Construct matrix L using function above

2.Construct matrix I using function above

3.Solve Normal map N by: $N = (L^T L)^{-1} L^T I$

4.Do vector normalization over N.

5. Manually construct matrix M and V through Normal map N.

6. Solve Mz = V, to get the depth map z.

7. Store z as a .ply file and show it.

Above is my report of HW1, thanks for the patience reading it all down here.