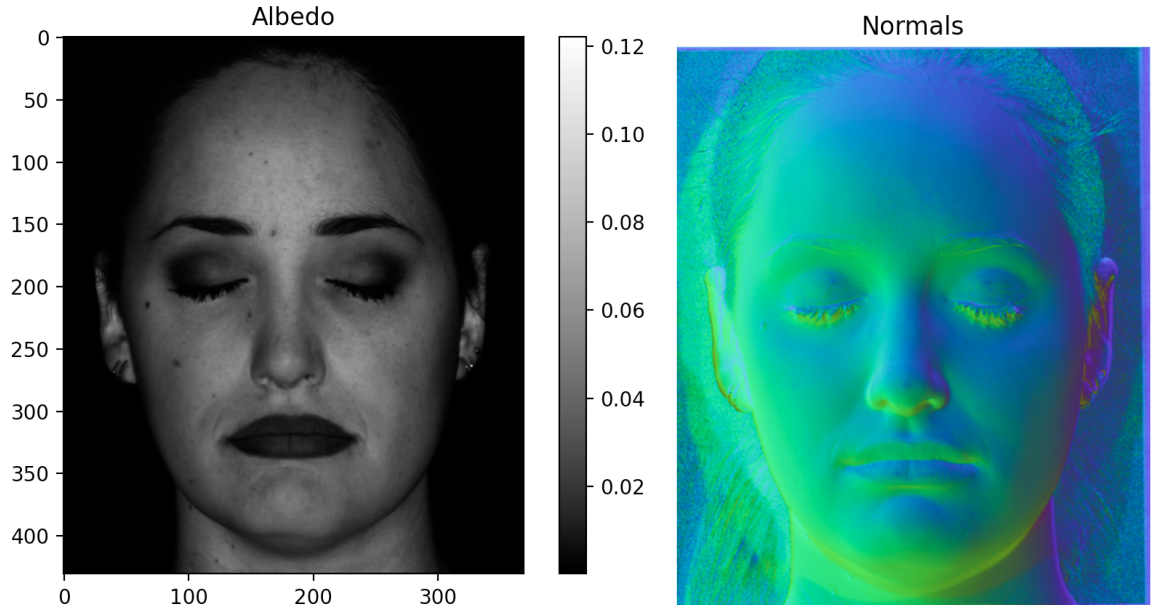
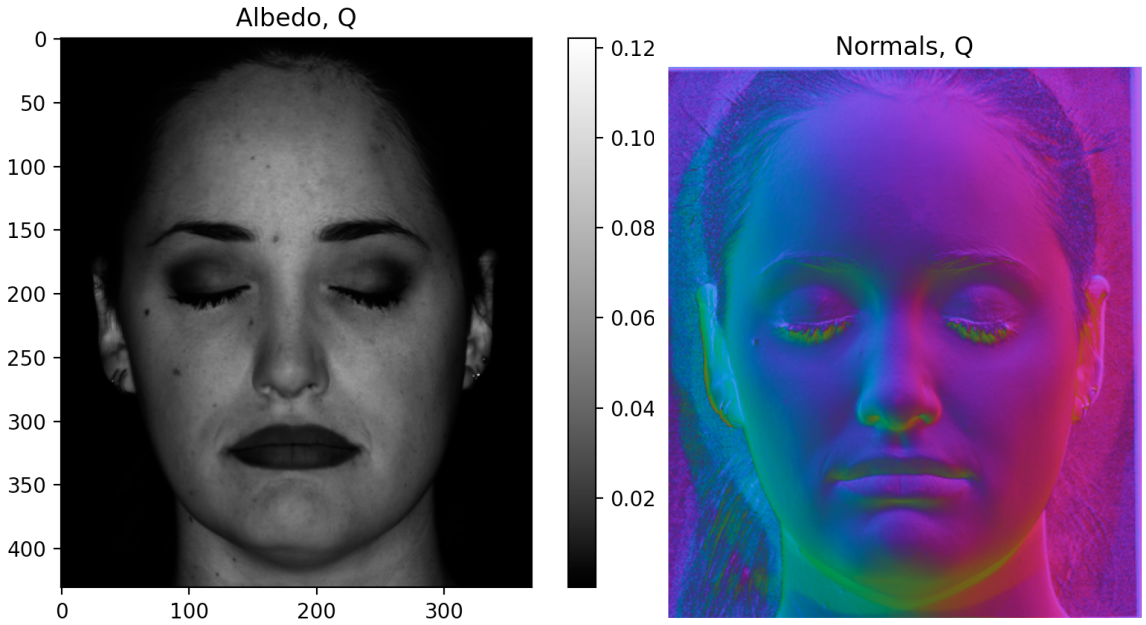
Jemely Robles
Programming Assignment 2

1. Photometric stereo

Uncalibrated photometric stereo:

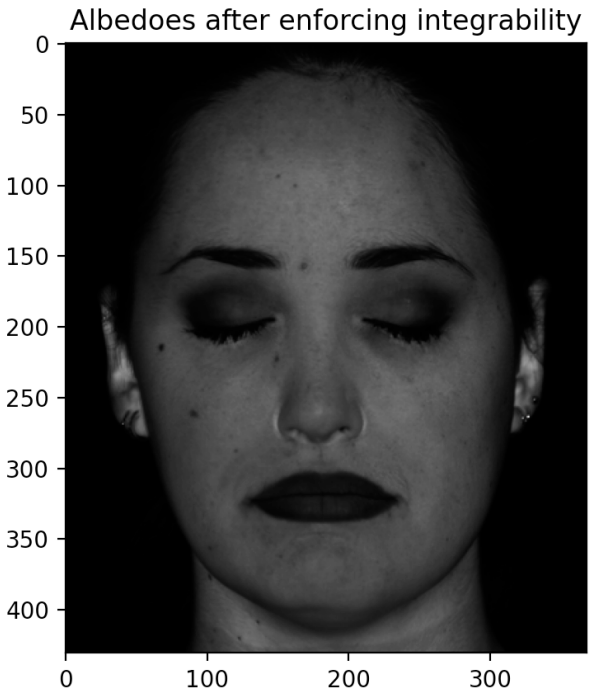
Reshape A_e and N_e into single-channel and three-channel images with the same width and height as the original image, and visualize the results. Additionally, select any non-diagonal matrix Q, and visualize the albedo A_Q and normals N_Q you compute from the corresponding B_Q.

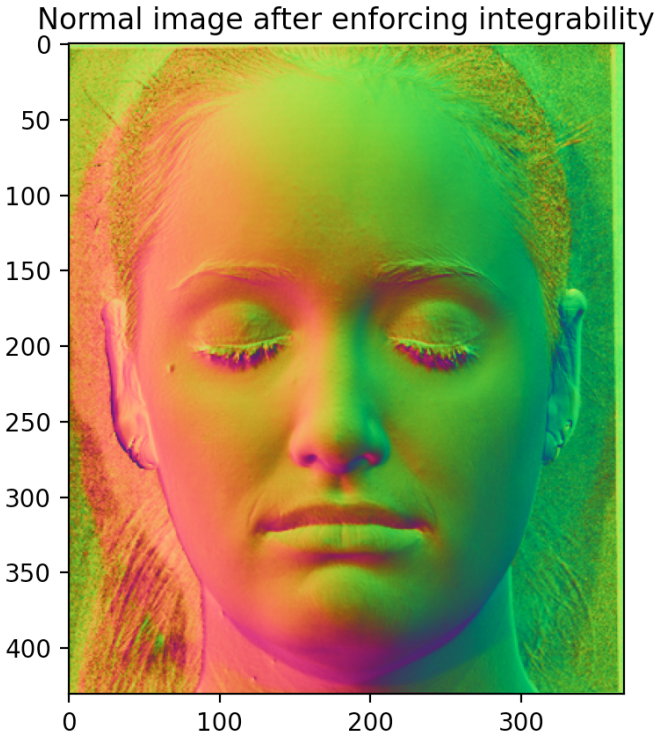




Enforcing integrability

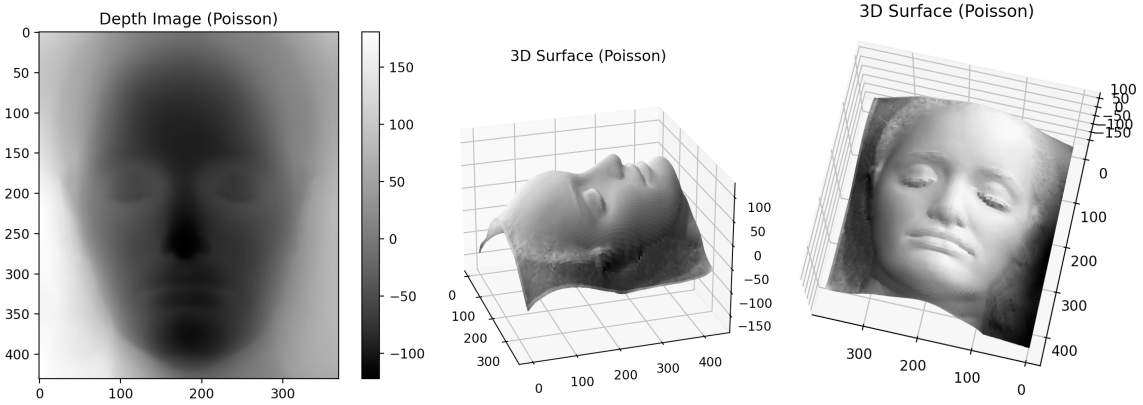
Once you have found Δ, apply it to the pseudo-normal matrix B_e, and then visualize the resulting albedo and normals.

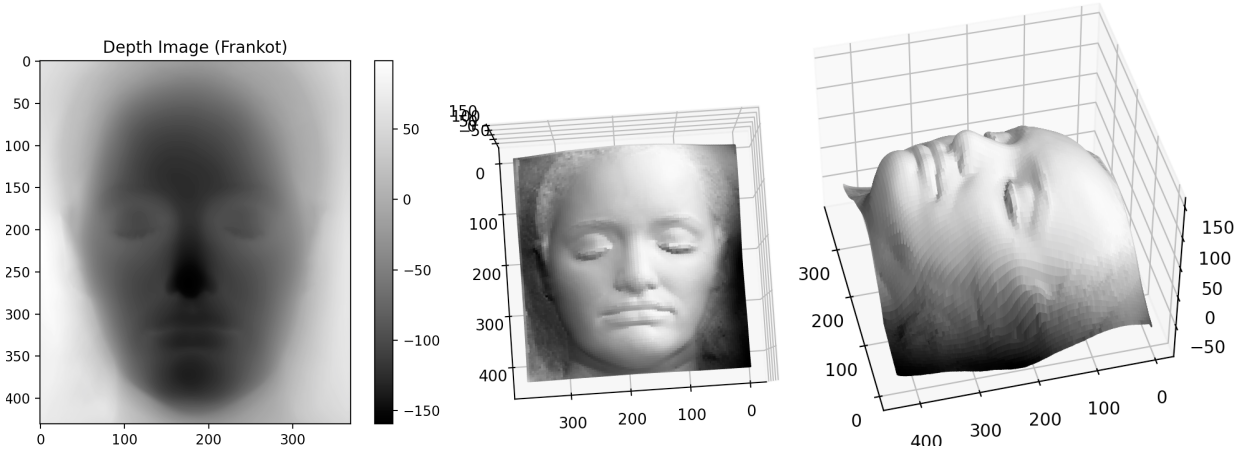




Normal integration

Visualize the final surface you reconstructed as both a depth image and a 3D surface.





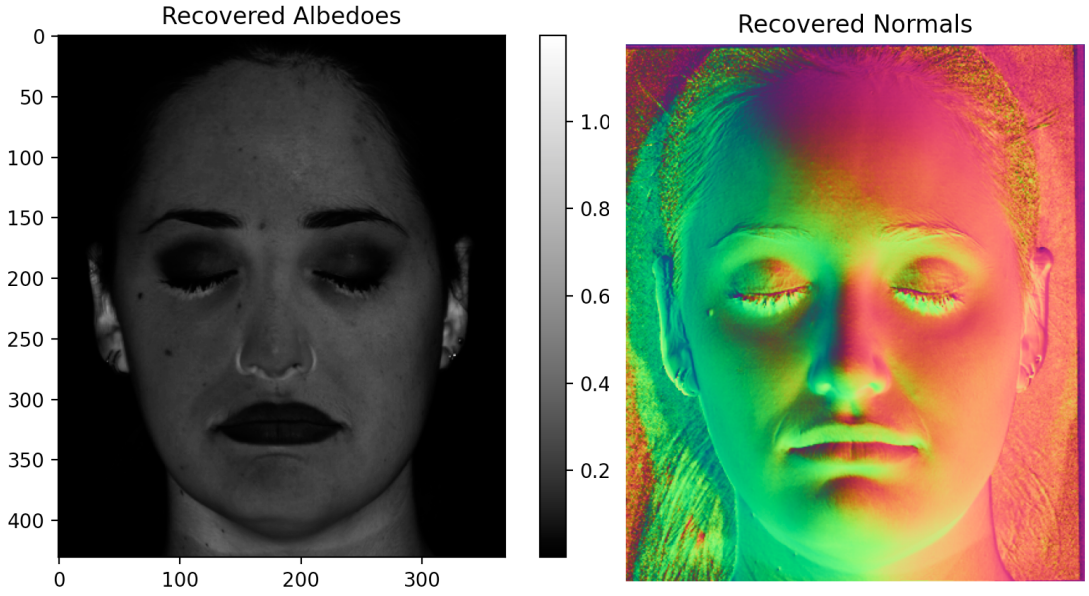
Franknot Franknot

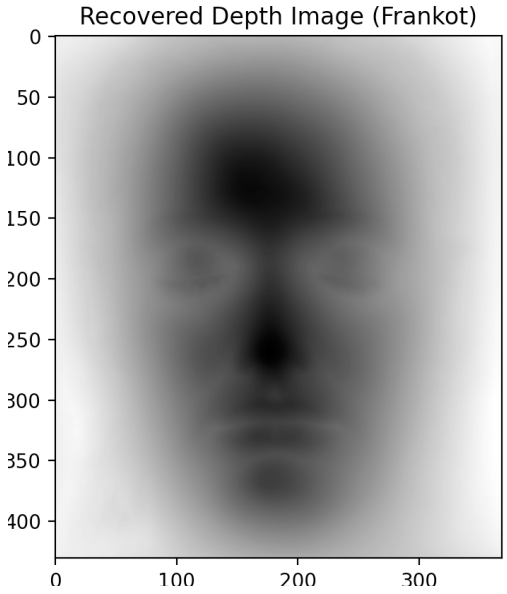
Report what GBR you end up using, and show the corresponding albedoes and 3D surfaces.

I ended up using Franknot.

Calibrated photometric stereo

Visualize the recovered albedoes, normals, and surfaces as before. Figures 3 and 4 show what you should expect to see. How do these results compare to the results of the uncalibrated case?



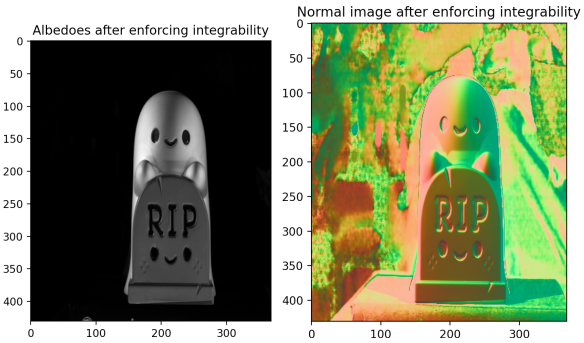


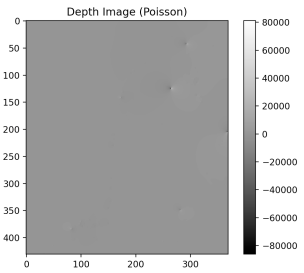
Compared to the uncalibrated results, these seem more accurate representations of the 3d world.

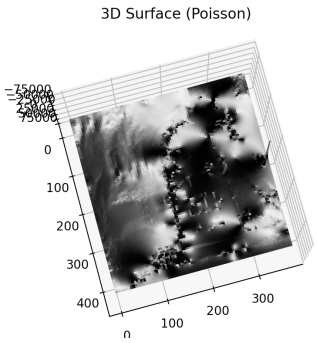
2. (Bonus) Capture and reconstruct your own shapes

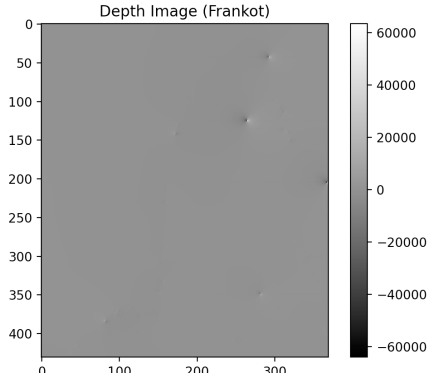
For each object, show one of the images you captured, and the albedo, normals, and surface you recon- structed. Additionally, show a rendering of both objects under a new lighting direction of your preference.

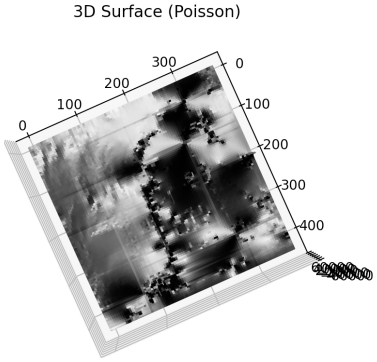
Matte object:

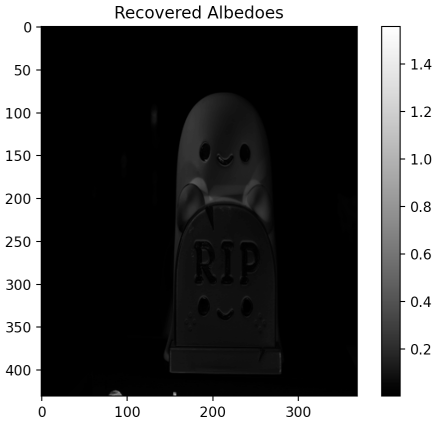


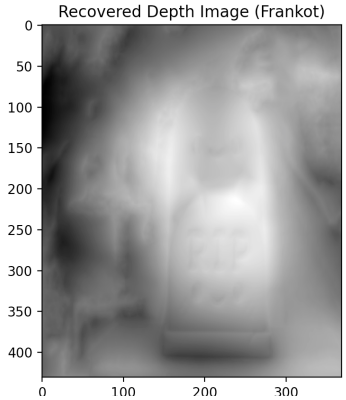




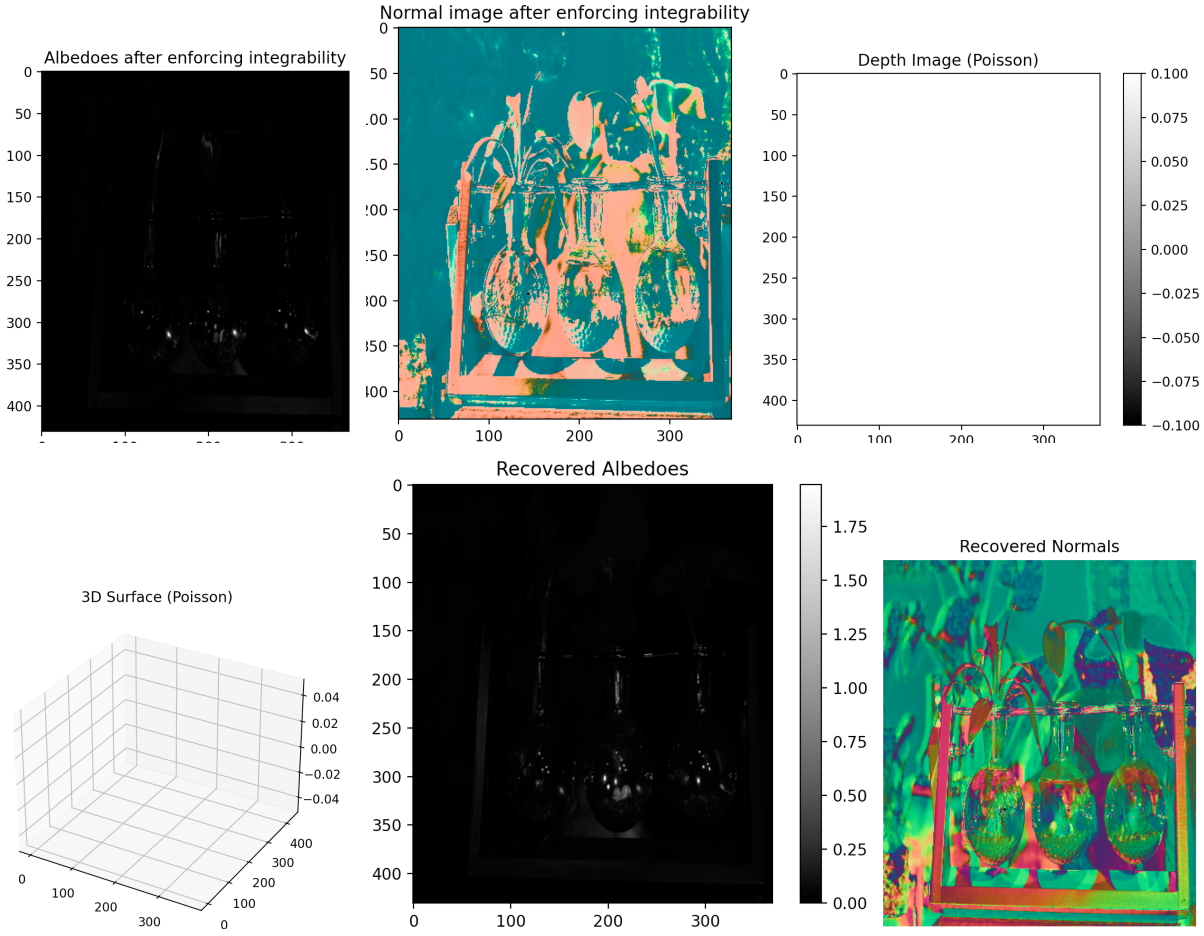








Shiny object:



The shiny object proved to be a lot more difficult to get results from.