CS 5670 HW4 Report

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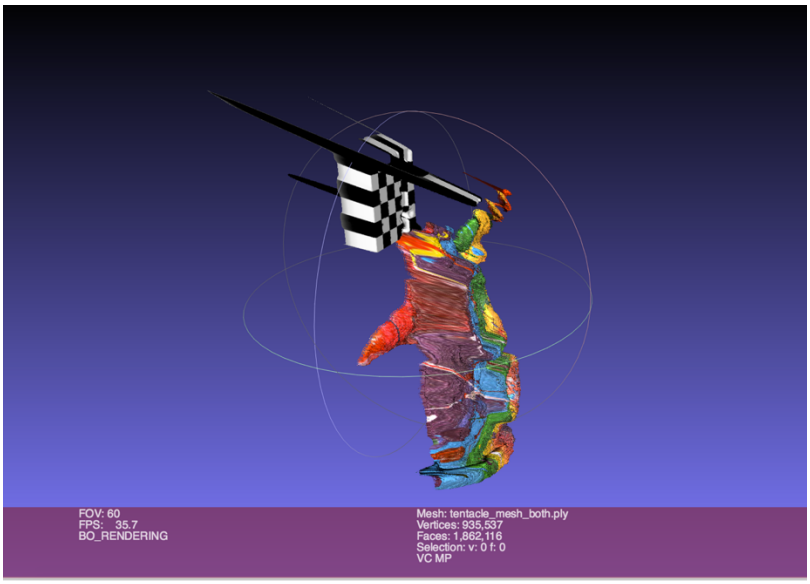
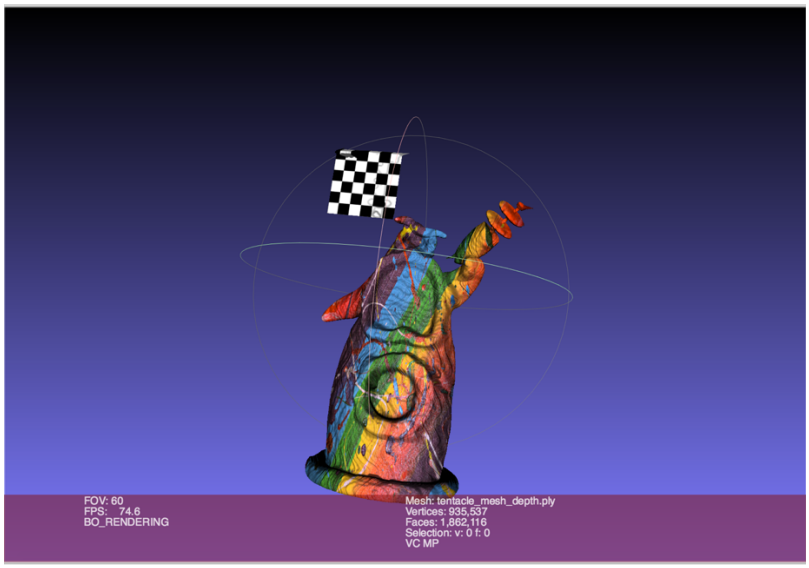
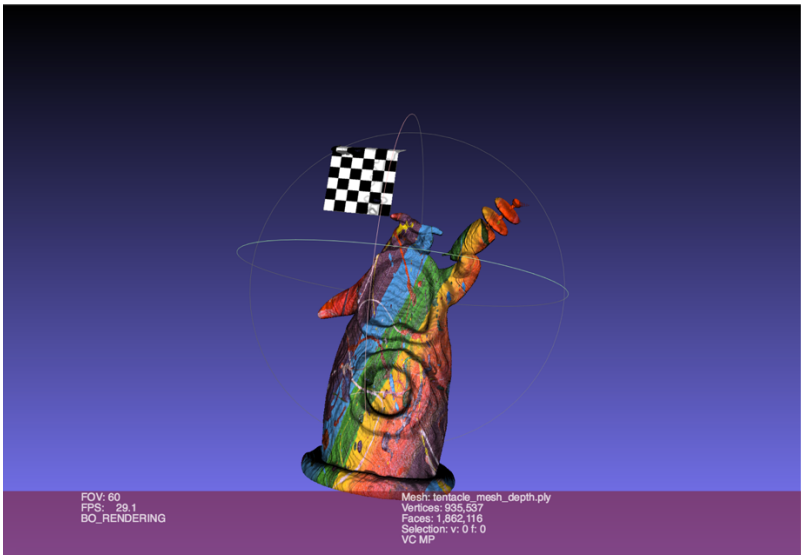
1. Tentacle Dataset with Mode Set to “both”:

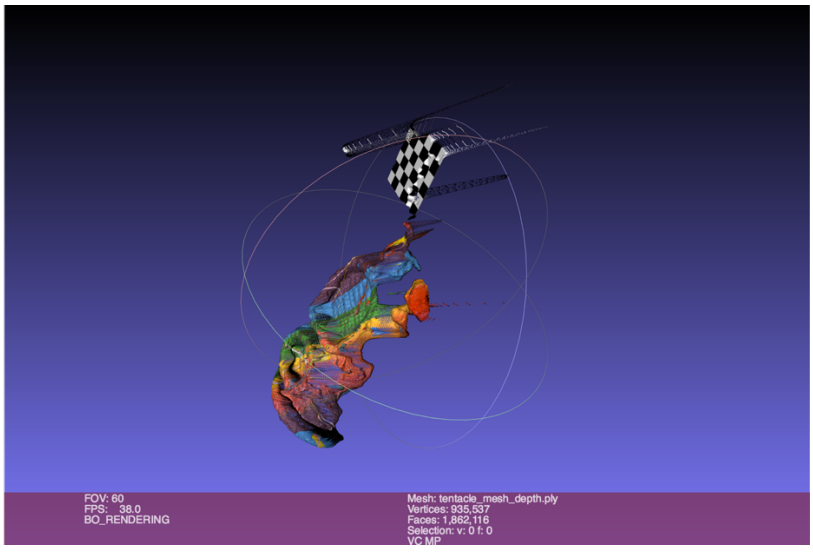




The overall tentacle looks good. However, the black and white grid on the upper left side has clear mistakes, because they should share the same surface. The upper left corner is stretched. This could be caused by poor lighting and reflection in the corner of the grid, thus leading to a falsified photometric stereo computation. The black and white colors have different albedos, so the alternating pattern of the grid and the changing albedo of the tentacle can be confusing during albedo and surface normal calculations.

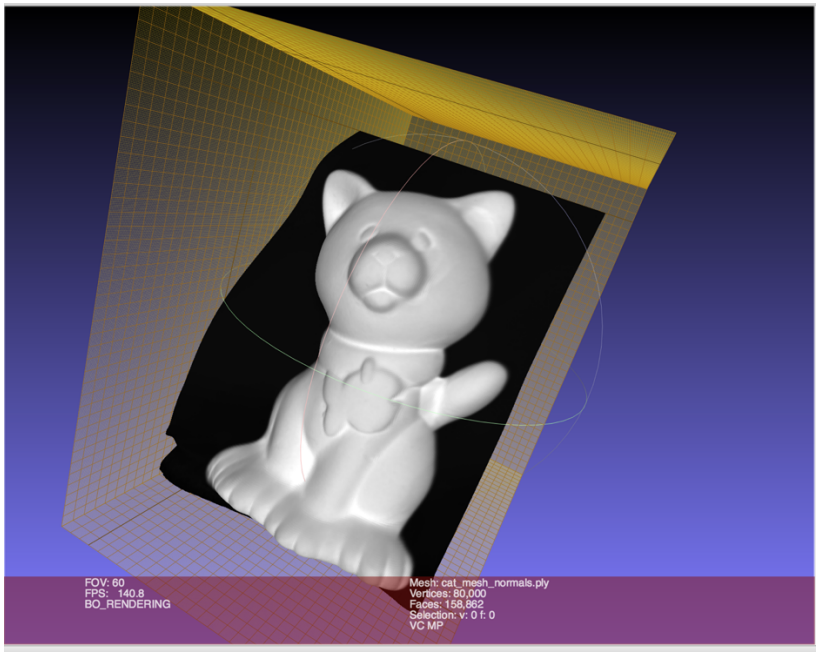
2. Tentacle Dataset with Mode Set to “depth”:

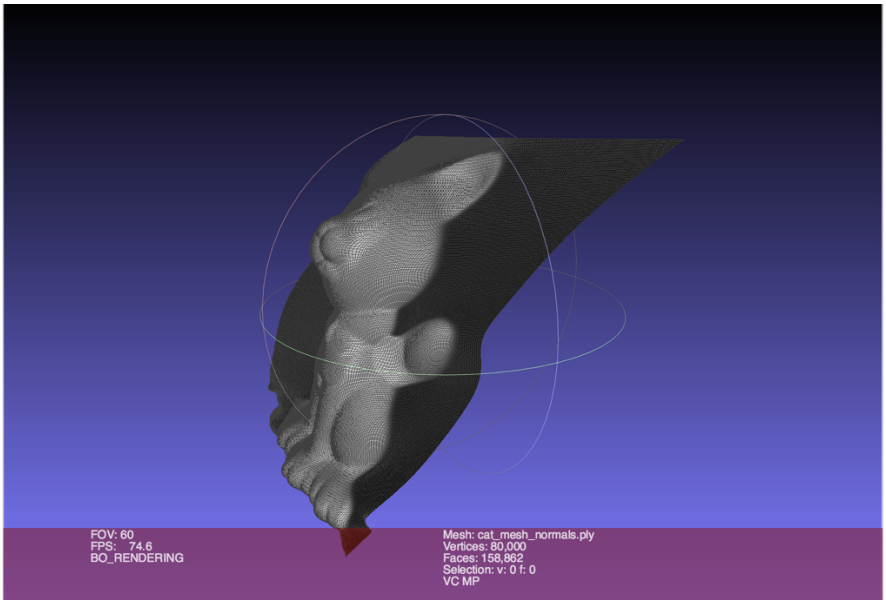




The plane swipe stereo of the tentacle also shares the same problem. The upper left corner of the black and white grid isn't working well, and the side looks rough. This false depth calculation could be induced by inconsistent lighting. The black and white color has different albedos, and the alternating pattern of the grid and the changing colors of the tentacle can be confusing during depth and NCC computation.

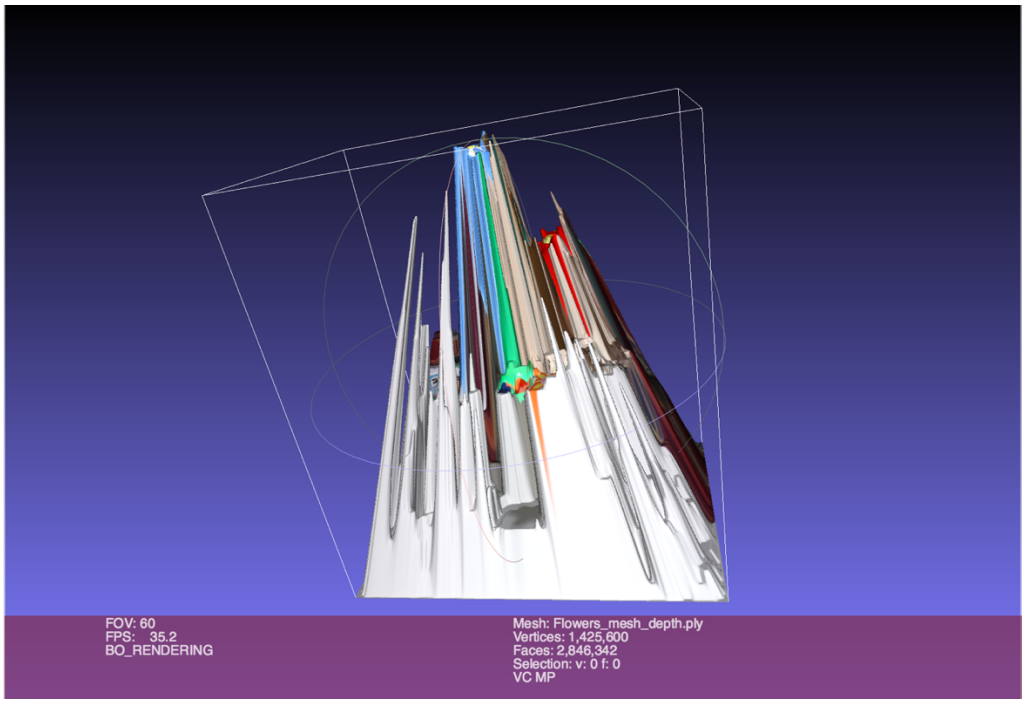
3. Cat Dataset with Mode Set to "normal":

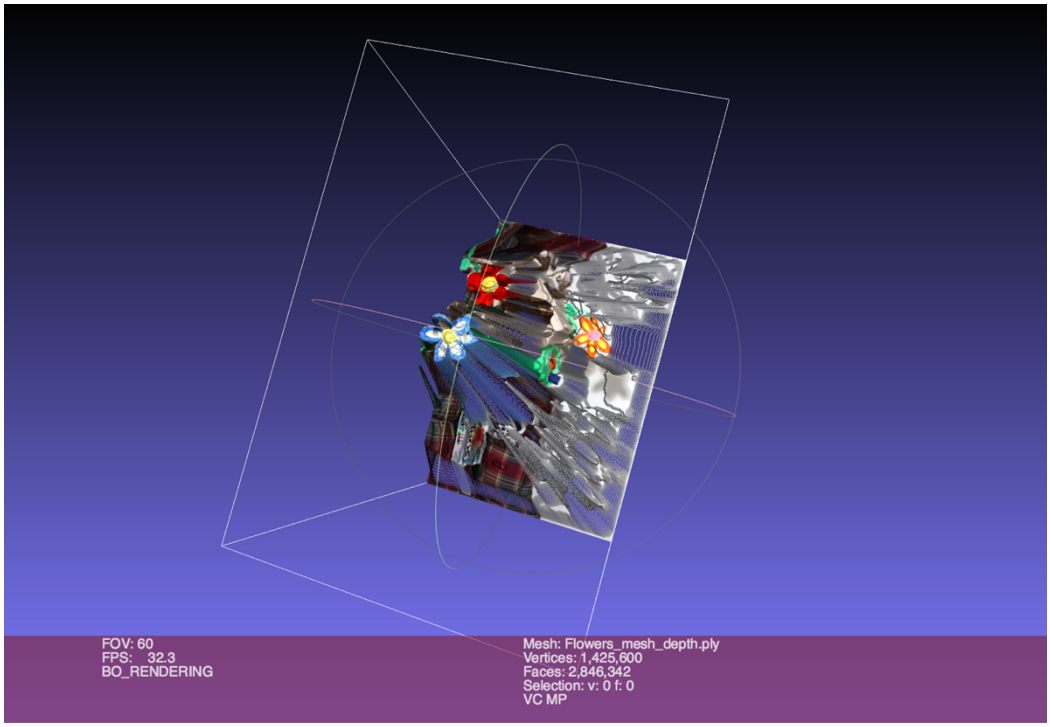




The photometric stereo of the cat looks good and without obvious mistakes. Since the cat has a uniform color and material, the albedo and normal are not hard to compute.

4. Flowers Dataset with Mode Set to “depth”:





The “Flowers” dataset that uses plane swipe stereo has clear mistakes of depths, especially at the bottom, leaving only the top flowers and the bottom sofa to be correctly identified. The depth of the wooden house is completely miscalculated. This is because of the interreflections inside the house. Also, interreflections and subsurface scattering in general could cause the depth calculation to be incorrect. Moreover, the color complexity of the flowers and sofa makes the depth and NCC very difficult to compute.