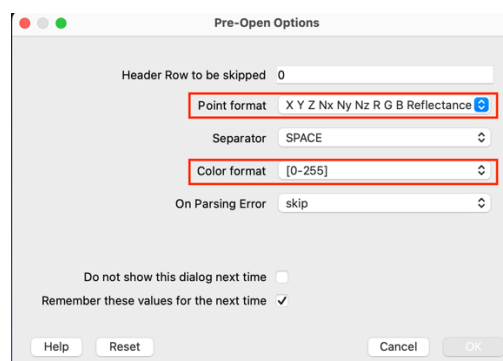


Homework#3: Cast the “color” on a 3D model

Date Due : 2024. May. 6th, PM11:59 (~2 weeks)

Description

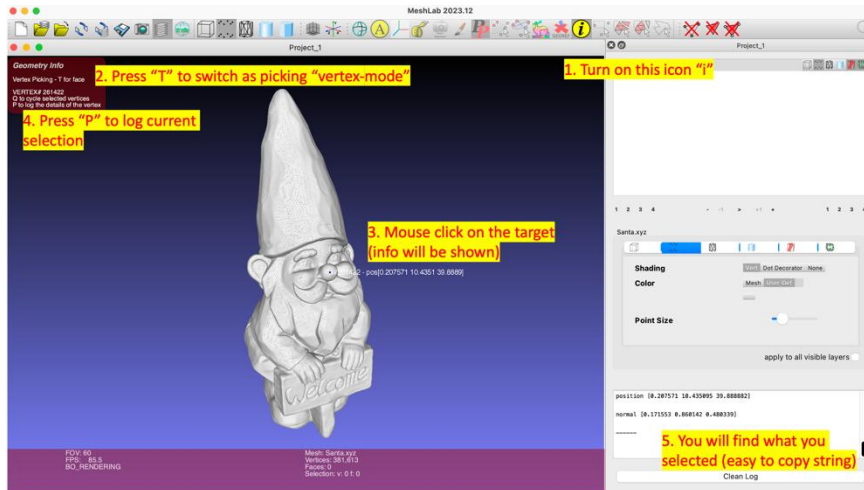
1. Writing a program to cast the color image onto a 3D model (choose your tools, ex. Python, C++/C, openCV, Matlab).
2. Please manually pick-up corresponding points by external software (ex. Photoshop, xnView, meshLab), and import (or copy & paste) the 2D/3D coordinate values into your source code. You don't need to write user-interface programs for picking up coordinate. However, you need to select at least **8 corresponding sets**, and calculate the “projection matrix **P**” by any method in lecture.
3. After you determine **P**, please re-project all 3D points of the model and find out what color those points should be. Note: You also need to **reject some points** who can't be seen from the position of camera (Hint: the normal vectors of vertexes are given).
4. One row in the raw data of the 3D model (Santa.xyz) is a vertex with its normal vector (Six floating – ex. [x y z xn ny nz]). You need to store your result into txt format by [x y z nx ny nz r g b a]. Then, you can import your txt file into meshlab, and set a correct parsing rule as:



5. Deliverable [4 items at most]:
 - 1) Source code in either python or C/C++, Matlab, etc. with simple comment.
 - 2) A 3D point cloud file in YouStudentID.txt (x y z nx ny nz and **32bit color**, ten elements in a row).
 - 3) A snapshot image for showing what points you have selected (either on 3D model or on the 2D image).
 - 4) Optional: Execution file (.exe) if applicable.Please zip all your files, and upload to moodle2 by date due.

Hint:

1. You can use meshlab to find out the 3D coordinate. Here is the SOP I summarize (follow Step1-5).
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