VR-DESIGN STUDIO

POINT CLOUD PLUG-IN EXTENSION

FOR POINT CLOUD COLORING

OVERVIEW

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CONTENTS

1   General method and algorithm for adding color to the point cloud

1.1   Introduction

The following is an overview of the general procedure for adding color to the point cloud.

For each point of the point cloud data select the corresponding Photo Log image from which colors are to be abstracted. The corresponding Photo image is simply the image that covers the position of that point. This is done by choosing from the whole Photo Log the image that was taken from the place nearest to that point.

Based on the vector from the place where the photo log image was taken to the location of a particular point within the point cloud, determine the place within the photo log image which corresponds with that particular point cloud data point and abstract the color of that point from within the photo log image.

Then for each and every point of the point cloud, repeat this process. In other words, for each and every photo log image, abstract the color of all the places within the image that corresponds to the points within the point cloud.

Calculate the weight (intensity) of the color based on the vector from where the photo log was taken to the location of the point of the point cloud and hence to the place within the photo log image that corresponds to that particular point. Then merge the colors by taking into account the weight that has been calculated.

Determine the points to be colored and do step 1 to step 3 below.

2 Operation of the software

2.1 Importing the cloud point data

Click the "Open Files" button on the upper left of the "Point Cloud Modeling Plug-in" window to open the window used to select the desired point cloud file. After the point cloud has been loaded, the name of the imported file and the number of points will be displayed in the "Point Cloud Modeling Plug-in" window as shown in Figure 1.
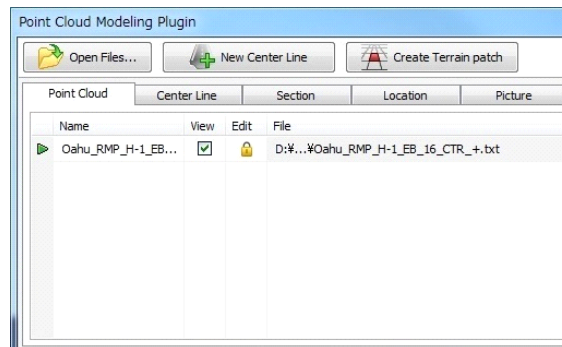

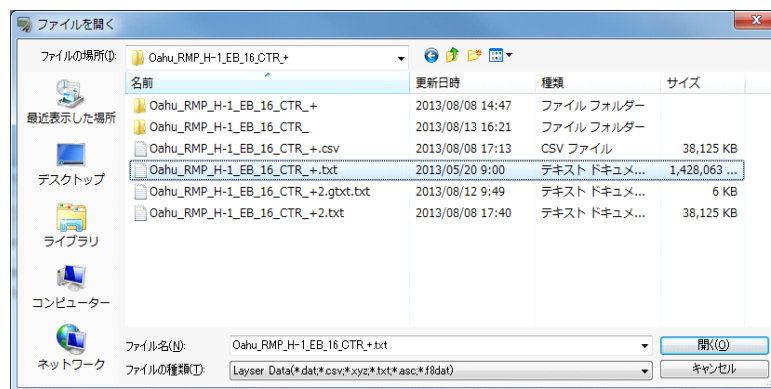**Figure 1.**　　　**The "Point Cloud Modeling Plug-in" window**

Figure 2.　　　**The window for loading the point cloud data file.**

2.2　Importing the configuration file

The configuration file is loaded in the same way as the point cloud data file i.e. select the configuration file of your interest by first clicking the "Open Files..." button to open the appropriate window. When the loading process is complete, arrows indicating the location and the corresponding Jpeg image file, as seen in Figure 3, will have been loaded and the list of these loaded files will be displayed.

You can preview the image by clicking on the Picture tab, and then right clicking the image file in question and selecting "Preview".

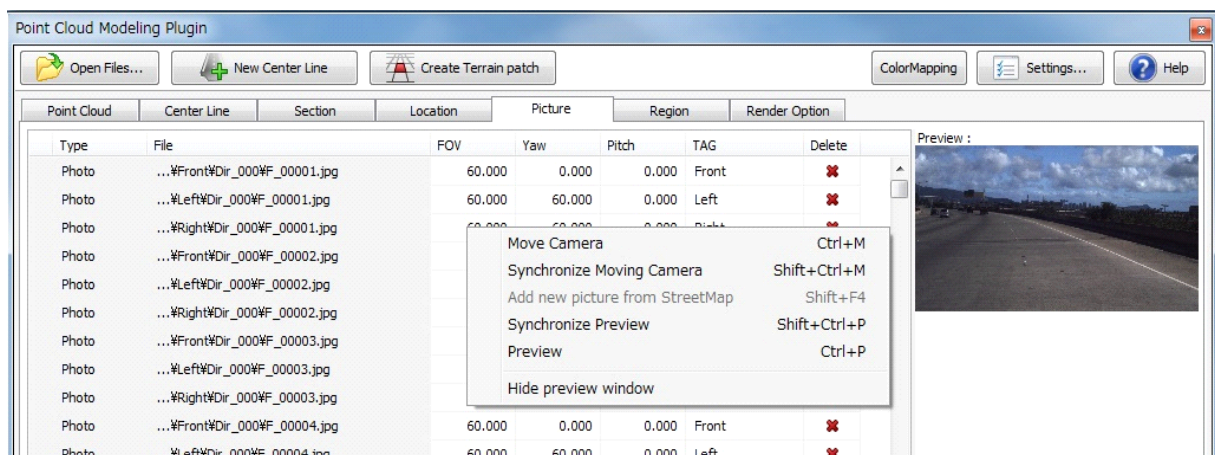**Figure 3.　　　Photo Log – Location**

Figure 4.　　　Photo Log – Picture data

2.3 Setting the extent to which color will be applied

If you open the "Region" tab of the "Point Cloud Modeling Plug-in" window, and then right-click and select "Add new Regions from PCL" from the menu, a virtual box will be displayed on top of the "Location" of imported point cloud data, as shown in Figure 5. This will be the region of the cloud which is to be colored. The size, position and angle of this region can be adjusted in the "Region" tab as shown in Figure 6.
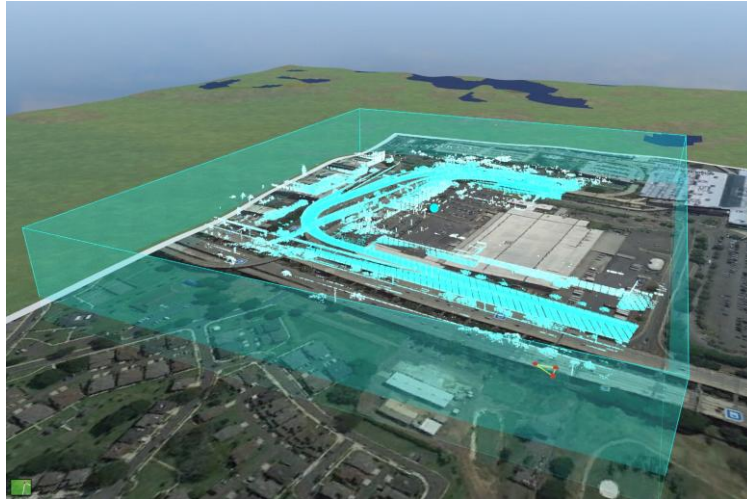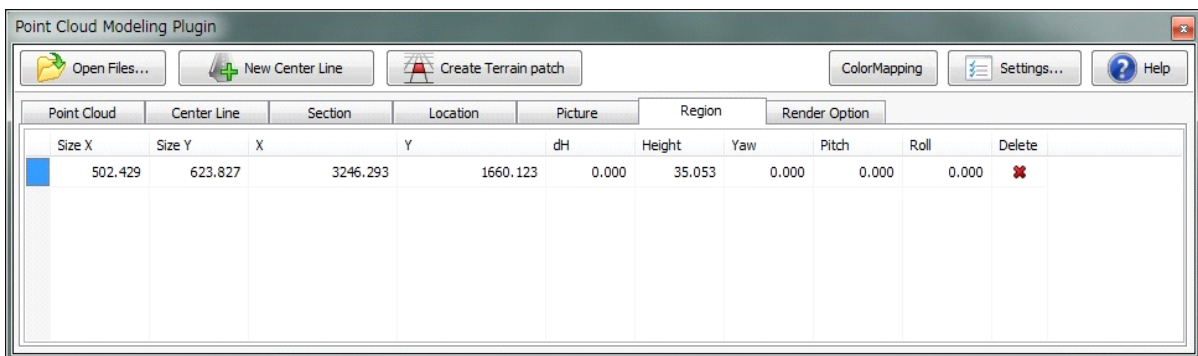

Figure 5.   Region – Coloring region

Figure 6.   Region – Editor

2.4 Defining photo log images and correction function

Pressing the "Color Mapping" button located on the upper right of the "Point Cloud Modeling Plug-in" window opens a window as shown in Figure 7. This Color Mapping feature enables the user to define the color value due to the distance, as described in the Color Correction section of this user manual. This feature provides users with the option to alter the amount of change in color value (intensity) due to distance.

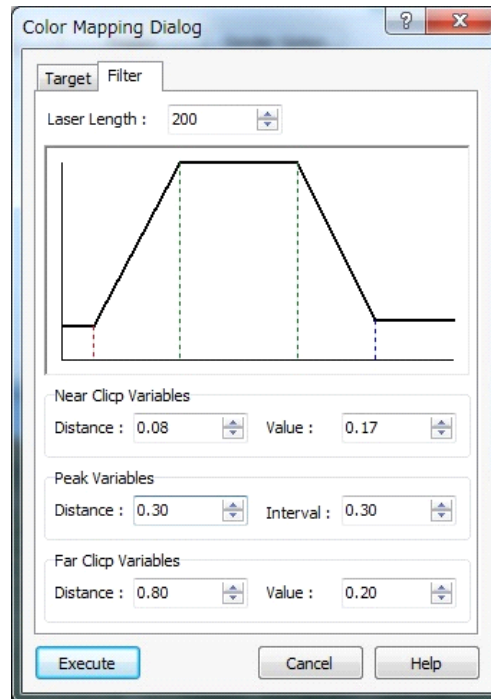Finally press the "Execute" button on the bottom of dialogue to start the process of coloring the point cloud.

Figure 7.   **Window for assigning parameters**