Building a mesh with Polyworks from text files

CyberMapping Lab
UT-Dallas
2009
Overview of Polywork Interface Platform

Polyworks prior Version 10 interface platform

Polyworks Version 10 and after interface platform
Overview of Polyworks Modules

**ImAlign:**
Used to align two or more different scans

**ImMerge:**
Used to merge one or more scans and create mesh

**ImEdit:**
Used to edit 3D models like filling the holes, add and delete triangles

**ImCompress:**
Used to reduce the amount of triangles in the models

**ImInspect:**
Used to do analysis for 3D model like measurement and compare between two models

**ImTexture:**
Used to add and maintain the texture on the models

**ImViewer:**
Viewer to display the models
PolyWorks/Workspace Manager Basics

Introducing the Workspace Manager
The PolyWorks/Workspace Manager (WM for short) makes using PolyWorks modules and managing files easy. The WM manages a PolyWorks process from beginning to end, offering simple navigation tools between modules and easy process workflows for new users. The WM contains your input files and PolyWorks Projects, as well as files created as a result of the PolyWorks process. It also offers quick access to PolyWorks modules, Projects, or data.

In short, the WM lets you:
- manage the contents of a workspace
- navigate within the PolyWorks process easily via the Wizard window
- contain your input files, your Projects and the PolyWorks-generated files
- document workspace objects by adding notes and images
- share information with your colleagues quickly
Polyworks Help Guides

For more information, use help guides in the main polyworks window.
Importing ASCII File to ImAlign
Open or create workspace window popup each time polyworks program startup. Create a new workspace for your work or select an existing workspace if you already have one. For quick work or test that you don’t need to save any work you may select cancel.
Import Scan Data to ImAlign
You should get it from here for the first time then it will appear in the recent formats.

Then Click Browse ... and navigate for the point data.
Select Point data file

Then click open
Instructions:
1. Using the mouse, give the data the desired orientation.
2. Click on "Anchor" anytime to define a new viewpoint facing the current orientation.
3. Check "Use plane" to enable a plane that can be used for clipping points. Use the slider to translate the clipping plane along the current viewpoint.
   Hint: point selections can be performed by pressing Spacebar. Several operations can be performed on the selected points using the dialog box's menu.
   Hint: the point cloud can be subsampled by specifying a subsampling value and clicking on "Subsample".
4. Click on "Next" or press Tab to go to the next step.
5. In the dialog box that appears, specify a new value for the maximum edge length to preview the resulting triangulation.
   Hint: experiment with several values for this parameter, as it can be used to clean up undesired triangles.
6. Specify the interpolation step and/or the maximum angle.
7. Click on "OK" to create the image using the current values, or click on "Cancel" to cancel the operation.

Hints:
* For some formats, it is possible to bypass most of the steps above and perform an automatic generation of images. To use this feature use the dialog box's menu "Edit→Auto organize".

Shortcuts:
* Press Escape to exit the mode.
Clean the data by pressing the space bar once then press middle button of the mouse and press shift + control button in the same time, then select the point that you want to delete then release all buttons and just press right button of the mouse the selected data will be in red color. Press delete button in keyboard the point data will delete.
When you finish from cleaning hit the space bar again to get the mouse arrow again, and then stretch the model by zoom to the data to be perpendicular to the data.

Click on Use clipping plane
Then click on Anchor
Then next tab
Change to 0.5

Leave it as it is

Zoom tell you see the triangle mesh

Then change the values in the import image window

Change 0.05

After finish click OK
1- When you finish click Done

2- Then click Yes
Clean the data if necessary with the same previous procedure.
Hit space bar + shift + ctrl + middle mouse button
Select the unwanted points then click right mouse button
Then delete the red points
Go to file

Then import ASCII point cloud then do the same as you did before.
Importing 3DD File to ImAlign
Import Scan Data to ImAlign (3DD Format)
you can select Multiple scans in one time
Change from 75 to 89
1- Change these values
   Each model has different value

2- Click update then zoom to the outcrop to see the changes

3- Click OK when you finish
Focus distance
A text box that specifies a distance from the scan origin. This distance is used for two purposes. At focus distance it identifies a circular zone of data points in the middle of the first range. Its value is then doubled to calculate the upper limit of the first range. Note that each time a value is specified, the **Step at focus** value is automatically calculated.

**Step at focus**
A text box that specifies the point-to-point spacing calculated by IMAlign at the **Focus distance**. Since it is calculated in the middle of the first range, it provides a good average interpolation step for that range. Its value is doubled for each subsequent range, and used as the interpolation step for the range when it is larger than the **Min. interpolation step**. You may also enter your own base value in the text box.

Max edge length
A text box that specifies the base value used to limit the maximum triangle edge length for each range. The default value is **1000**. It is recommended to change this value. This value is used for the first range and doubled for each subsequent range. Note that to see the bridging in the 3D rendering window, the drawing type of the Static display mode should be set to **Flat** (View > Image Default Static > Flat).
Subdivided files and this case there are 70 files