



GraphWorX64

Reducing Polygon Complexity in 3D Models



APPLICATION NOTE

September 2013

Description: Guide to reducing vertices in 3D models using the native GraphWorX64 polygon reduction functionality.

OS Requirement: Vista x64/ Windows 7 x64/ Windows 8 x64/ Windows Server 2008 x64/ Windows Server 2008 R2 x64/ Windows Server 2012

General Requirement: General understanding of 3D models and tools to create them.

Introduction:

One can use external programs to build 3D models as well as purchase already build 3D models from other sources. However, when models are built using third party software, they are generally built to represent objects with great details. In a human machine interface (HMI) project, many of the details become unnecessary and reducing the model's complexity will decrease demands on hardware to render it.

In cases like these, what we need to do is to reduce the details on the object. Sometimes, this can be as easy as reducing the number of polygons in the model.

- One of the converting tools you can use is Okino PolyTrans: <http://www.okino.com/default.htm>. You use this before importing the 3D model.
- In GraphWorX, Open a 3D image and double click on any object within it to change ribbon options
- You can reduce the polygons when importing the 3D model by changing the quality on the import options.

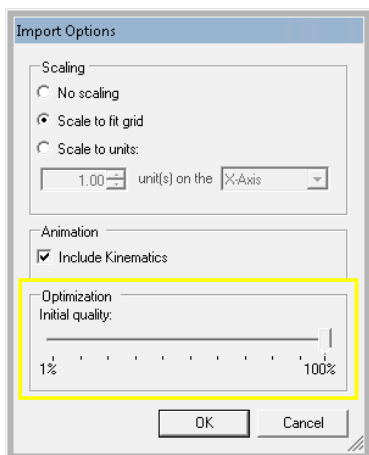


Figure 1 – Import options

- You can use the integrated polygon reduction functionality inside GraphWorX64.

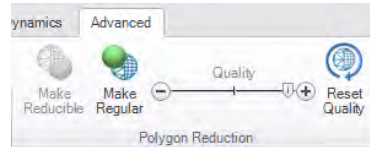


Figure 2 - Polygon Reduction

Reduction using GraphWorX64 Integrated Tool:

1. Let's take a more or less complex 3D object. In our example, we have a model with more than 51,000 vertices.

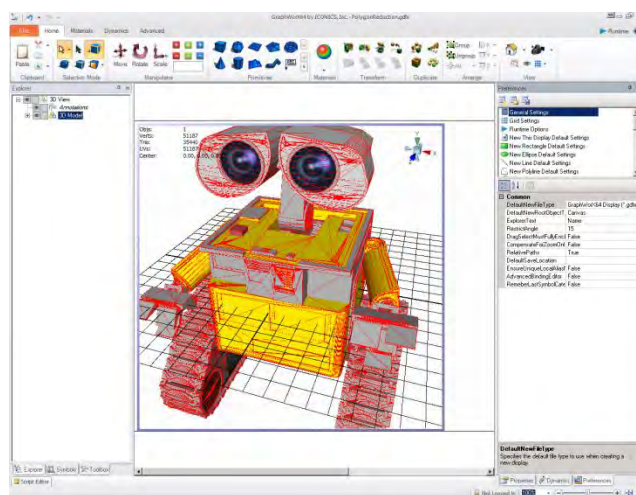


Figure 3 - Imported complex 3D model

2. In the Advanced tab you will find a section for Polygon Reduction.

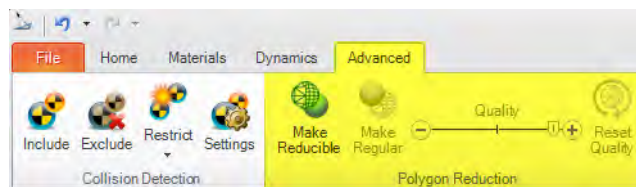


Figure 4 - Polygon Reduction part in the Advanced tab



GraphWorX64

Reducing Polygon Complexity in 3D Models



APPLICATION NOTE

September 2013

- Before you can reduce the polygons, you have to make the 3D model reducible. Click on "Make Reducible". This will perform an analysis and reduce the polygons. In our example, reduction is to less than 27,000 vertices, keeping the model visually appealing.

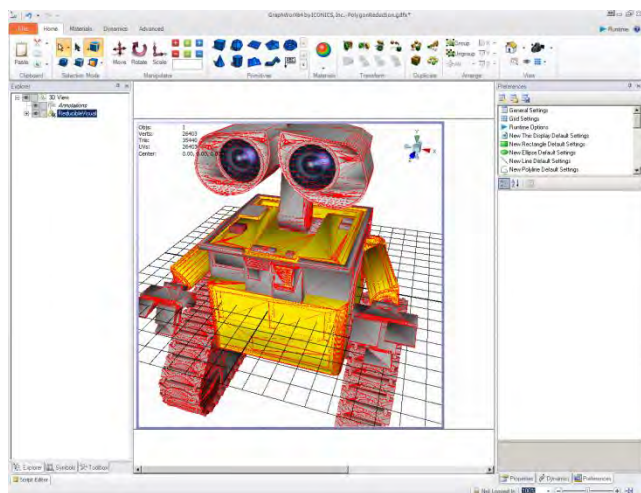
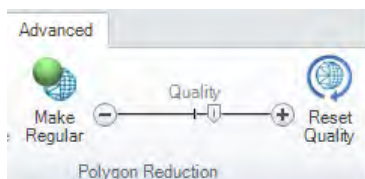


Figure 5 - Complex 3D model after making reducible

- After the 3D model has been changed to be reducible, you can select which part of the model, if not all, shall be reduced, in order to keep the visual quality while reducing the size of the display. The reduction can be performed in two ways.

- In the Polygon Reduction part under the advanced tab, you will be able to drag the slider. Drag it slowly towards the left and see the results on your selection.



- You can enter a value in the properties. This value represents the quality between 0 and 100%.

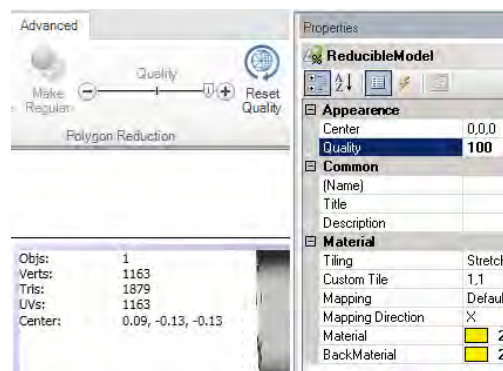


Figure 6 - 2 ways to reduce polygons

- You can make your model a regular model again. Click on the "Make Regular" button in the Polygon Reduction part. This way you can access the standard properties of the model or the model parts.

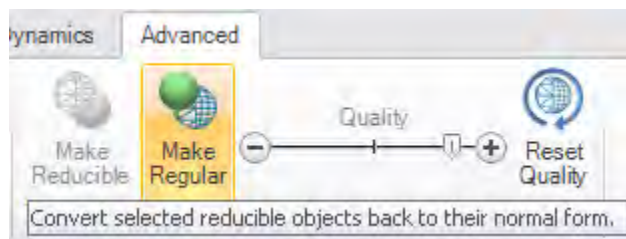


Figure 7 - Make 3D model a regular model

If you have many 3D models in your display, you can go through these steps and streamline your display for faster rendering.

In our example the original model had 51,187 vertices. The reduced has 24,998.

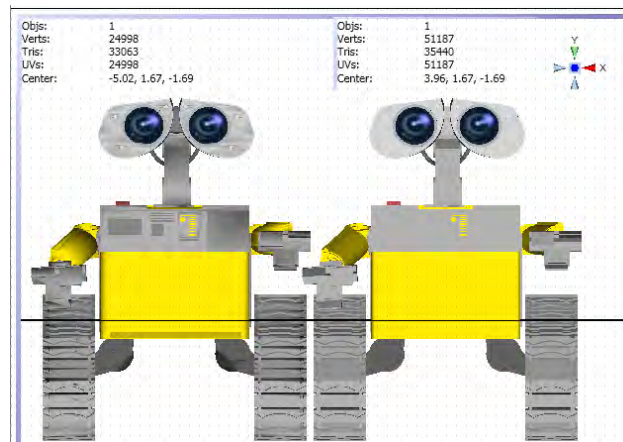


Figure 8 - Polygon reduced model and original side by side