



Tools for Asset Repair by PEV

Image by Alberte Zato

QuickShadows for TS12

This is an amended version of an article originally written for John King's Trainz Resources Newsletter.

Introduction

The QuickShadows tool is provided to the Trainz community for the generation of shadow meshes without having to use 3DSMax, Gmax or Blender.

Many rolling stock items downloaded into TS2009 and later show errors caused by missing shadow meshes, and now TS12 has a runtime device that checks the polygon count of shadow meshes. If a shadow mesh has more than about 1300 polygons it is ignored and a crude box is substituted, much to the annoyance of many users.

The original QuickShadows was conceived to provide a box shadow or a full black-only copy of the original mesh. With this limitation set by TS12 it seemed appropriate to try to provide a method to build a simple shadow mesh that could still be a reasonable representation of the shape of the parent object, in most cases some piece of rolling stock. Some method for maintaining some detail, yet utilising a reasonable degree of polygon reduction needed to be found.

The new process in QuickShadows looks at every triangle outline (its lines) and establishes a profile on a grid, and then applies a poly reduction technique to the result. This process is repeated for a number of planes (up to 6) to create an inside-out shadow mesh; meaning the side nearest the cast shadow does most of the work. A completely different approach to the normal shadow construction. The shadows made with this method have no top plane (or roof).

Shadow meshes for average sized locos and wagons with reasonable detail can be made with less than 1000 polygons.

The above method makes the new "Simple Shadow Mesh". The original "Box Shadow" and "Full Shadow" options are still provided. If used with AssetX a fourth option of an invisible shadow mesh is also available.

For all its options, QuickShadows.exe creates a

temp.XML file which is then converted to IM by Auran's TrainzMeshImporter program. Auran's policy of having their own software make all game content is thus maintained. The TMI is included in the installer program.

The shadow mesh ("shadow.im" or any other name set by the user) is created in the same folder as the parent mesh and requires no textures. It uses the "m.notex" material that takes its colour from the light settings in the material. The "m.notex" material is made two sided by default so that all planes of the "Simple Shadow" mesh are always visible when viewed with my Trainz Mesh Viewer tool.

No 3D modelling or image manipulation programs are required to make the shadow. The shadow mesh may be moved within the asset folder structure (eg to a shadow folder) and, of course, the shadow mesh will need to be specified in the shadow container in the mesh table of the config.txt file. Refer to the Content Creators' Guide for Trainz Classics for advice on asset folder and file layouts. CCGTC can be downloaded from the Auran web site.

Using the QuickShadows Program

Installation

If you don't have this program, please download its installer program (PEV_QuickShadows_setup.exe) from my PEVSoft Download page.

<http://www.members.optusnet.com.au/~villaump/pevsoft.htm>

Run the installer and the QuickShadows will be loaded on to the Program Files area of your C: drive, along with a desktop icon and an entry in the PEVSoft folder of your All Programs menu.

TrainzMeshImporter.exe is included in the setup program. It may require a further download from MicroSoft (See below)

If you have TS2009 or later, QuickShadows will create 'OpenWith' macros for Content Manager 2 and 3 to allow you to run QuickShadows directly from the Content Manager for each Trainz version

On first launching QuickShadows it will check that the OpenWith macros for the Content Managers have been set up. The program generates these automatically if it finds TS2009, TS2010 and/or TS12 installations in the default locations. Once done this process is not repeated, until the user selects Open With from Setup in the main menu.

If you choose Open With, the program scans your PC for Trainz installations. If it finds any in the default locations, the OpenWith macros are automatically installed.

If a default installation is not found, the program presents you with a Find Folder dialog. If you do NOT have the Trainz version requested then press the Cancel button. Otherwise locate the TS2009 or TS2010 or TS12 application folder as requested and select it. The OpenWith macro will be automatically placed into the selected Trainz installation.

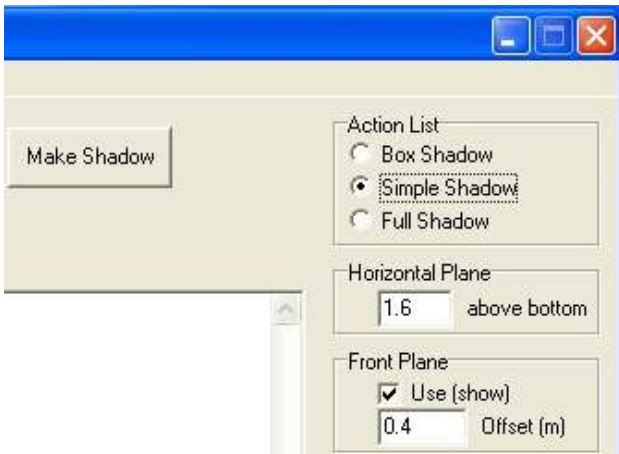
Opening a File

The program can open .pm and .im files only.

To Open a File, start the program and click on the File menu. Click on Open and the open file dialogue box will be displayed. The file extensions are filtered so only the correct types can be opened.

When a file is opened the program shows a notice suggesting you press the Make Shadow button to proceed.

Before doing so you need to select a shadow type from the Action List at the top right of the program window.

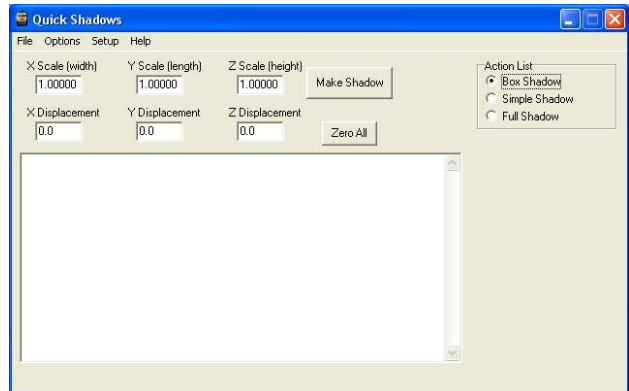


To make a shadow press the Make Shadow button.

The Exit option closes the program.

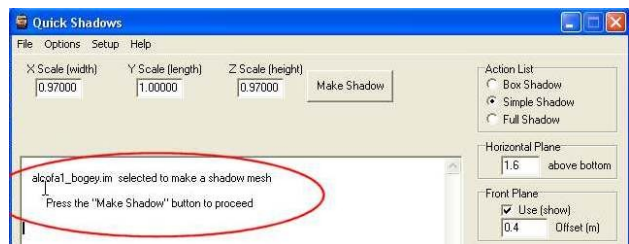
Making a Box Shadow

When opened from a short cut, the program will await a file open instruction from the user.



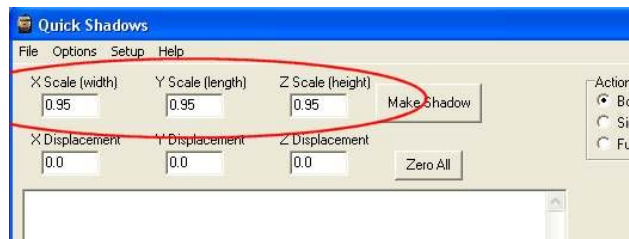
Click on the File menu. Click on Open and the open file dialogue box will be displayed. The file extensions are filtered so only PM's or IM's will be visible. Select a mesh to make a shadow for.

The program will confirm your mesh choice and show a notice suggesting you press the Make Shadow button to proceed.



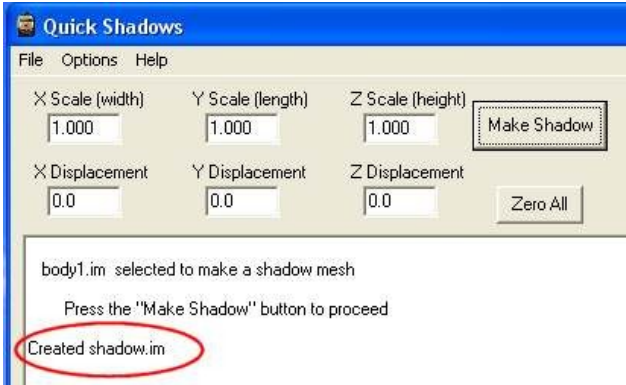
If the "Box Shadow" option is selected from the Action List then the program will make a box shadow mesh. (as in the figure to the left)

For a shadow mesh to be successful it needs to not protrude through the skin of the parent (or default) mesh. For the box mesh, independent scaling factors are provided for length, width and height. Because the shadow mesh box size is created from a bounding box for the parent mesh it is highly likely that the mesh will be too large. Use the scaling factors to reduce the size. A Scaling factor of 1.0 is full size.. Use decimal fractions (eg 0.8) to reduce size.

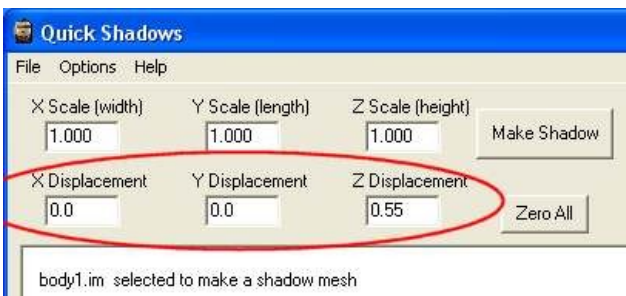


A hidden scale factor is included so that the shadow of a rectangular object is slightly smaller than the object, This is intended to prevent any rendering conflicts that can cause the dreaded phasing effect in the game.

Press the "Make Shadow" button and shadow.im mesh will be created. When completed the program will tell you that the shadow.im file has been created.



If the shadow mesh is offset from the main mesh when you view it in Trainz, the box shadow can be moved using the X, Y, and Z Displacement values. These values are in metres.



For example, if the shadow is too low, you can move it up by entering a positive value into the Z Displacement box. This is common where the parent mesh has a small portion that is higher than the remainder of the mesh, eg a post. Note that this feature is only available for the box shadow.

The "Zero All" button can be used to make all displacements zero. Note: the displacements default to zero when ever the program is opened. These values are not stored for later use.

Files opened by double clicking in Windows Explorer can automatically have a shadow mesh created if the "Auto Make" option is SET (checked). The program will close automatically after a short pause if the "Close on Done" option is SET.

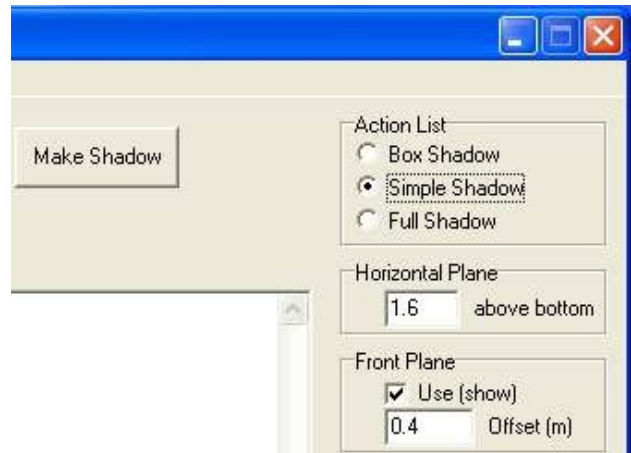
The shadow mesh is created in the same folder as the parent mesh. It does not require any textures.

Making a Simple Shadow ** NEW for TS12 **

When opened from a short cut, the program will await a file open instruction from the user. Click on the File menu. Click on Open and the open file dialogue box will be displayed. The file extensions are filtered so only PM's or IM's will be visible. Select a mesh to make a shadow for.

The program will confirm your mesh choice and show a notice suggesting you press the Make Shadow button to proceed.

Choose the Simple Shadow option from the Action List at the top right of the program window.



The simple shadow can consist of up to six (6) shaped planes.

An Example

Let us now make a shadow using Paul Hobb's excellent LNER Gresley A3 steam loco as an example.



From the file open dialogue select the mesh with the highest level of detail and open it. It doesn't matter if the parent mesh has a huge number of polygons. QuickShadows creates a fixed number of polygons for each plane it generates and then does poly reduction on that plane as it is drawn.

Turn off all the plane "Use" options and press the "Make Shadow" button.

The floor plane and longitudinal centre line plane form the backbone of the shadow, as shown.

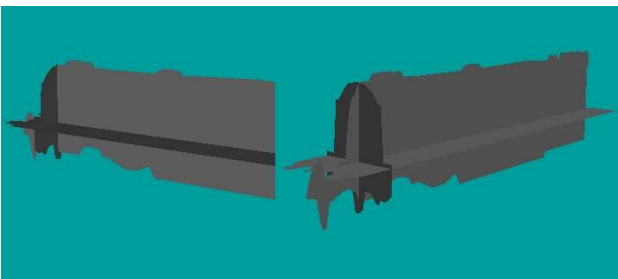


Note that in this example the floor plane offset is 1.6m above the lowest extremity and no front, back or side planes are used.

If we now enable the front plane we can move it to the correct location. Press the Make Shadow button again and the mesh will be rebuilt.

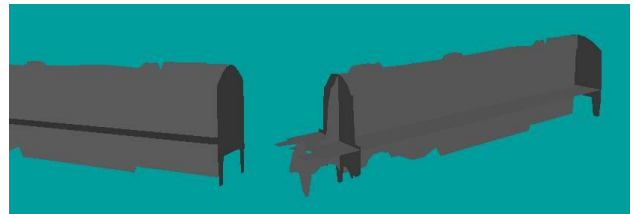


Here we have the front plane with zero offset; just showing the buffers and coupling or hose. Now we change the Front Plane Offset to 1.65m, and make the shadow again.



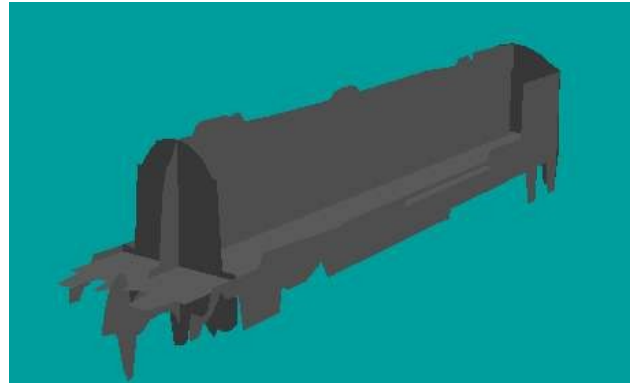
The two views above show the front plane now in the shape of the front of the boiler located just where the boiler shape commences. With the sun behind the loco it will now cast a shadow of the boiler correctly.

Now we enable the Back Plane with zero offset and make the shadow again.



Here we have the shape of the back of the cab and cab steps at the back extremity.

To get closer to the true shadow shape we also need to enable the Side Planes and re-make the shadow.

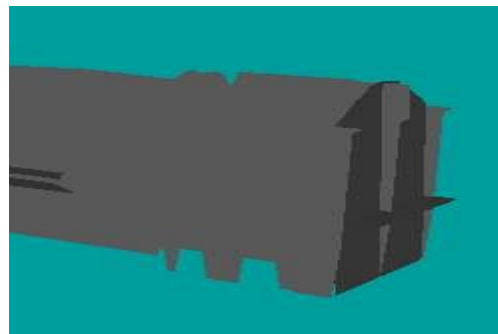


The shadow cast to the side to the loco will now show the cab correctly.

In the Mesh Viewer rotate the shadow mesh around to ensure that there are no gaps between the planes. In this case we will have a gap at the rear of the cab as below.



Adjust the Back Plane offset to 0.4m and re-make the shadow.



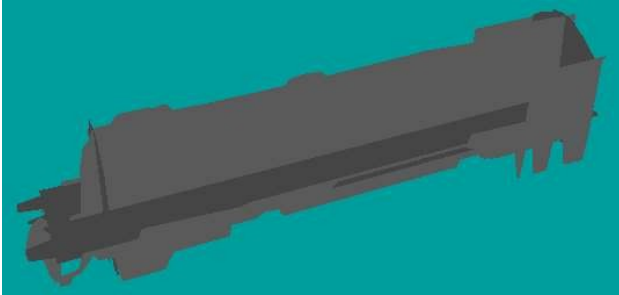
It is advisable to have a small offset of say 0.05m for the

Side Planes. This ensures that any gaps caused by the point sampling method are closed up.

Scaling factors are provided to adjust the overall size of simple shadow meshes. It is recommended that the width and height scales be less than 1.00 (I used 0.95 in the example above) to prevent any rendering conflicts that can cause the dreaded phasing effect in the game. In most cases it is better to leave the length scaling at 1.00.

These scaling factors are different from those for box shadows and are stored for later use.

This completes the shadow mesh for Paul's A3. Poly count is 659 in this case.



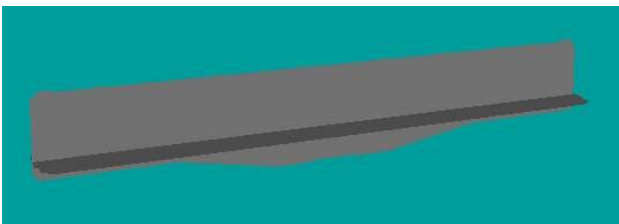
The checking of the progress of your mesh build can be done if you connect Trainz Mesh Viewer to QuickShadows. (see Setup section later). If you have set up the mesh viewer to check the shadow it will be opened immediately on completion provided that the Close On Done option is NOT set.

Another Example

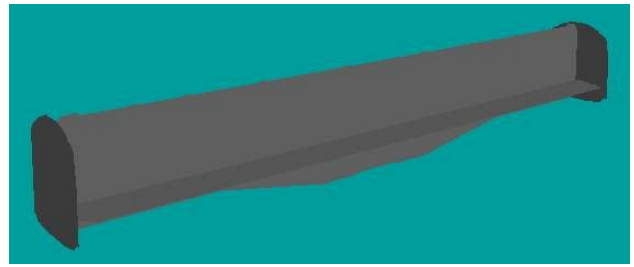
Now let us build a shadow mesh for a regular shaped passenger car. I have chosen the BR MK1 Crimson and Creams for this example.



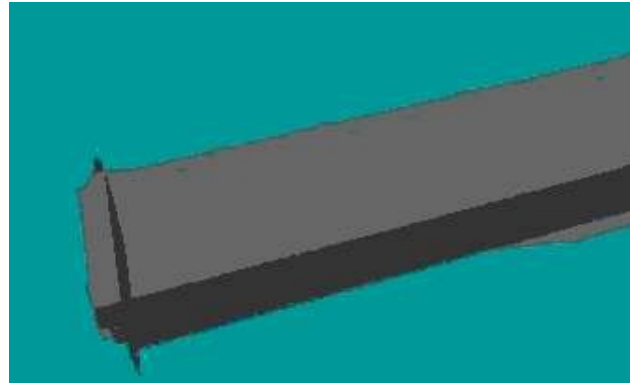
Again we start with plane options all off and we get the following.



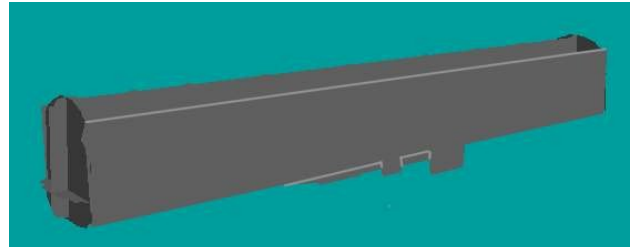
Because the car is symmetrical we can turn on the Front and Back planes together.



In this case the cars have bellows passageways connecting them, so the roof of the car commences about 0.4m from the ends. Set the Front and Back Plane Offsets to 0.4m.

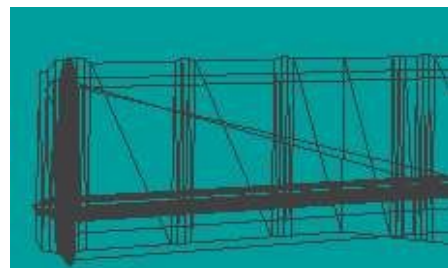


The Side planes can now be enabled (again with the 0.05m offset)

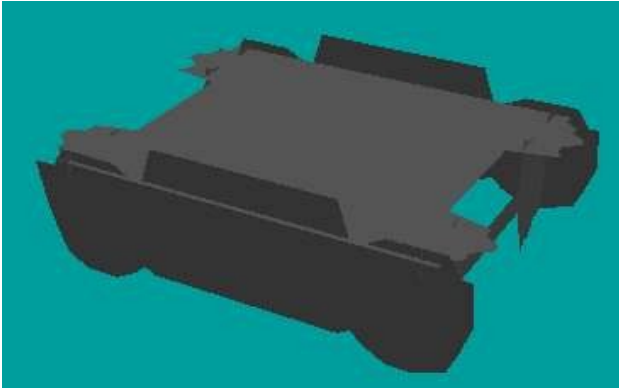


The BR MK1 shadow mesh is complete.. poly count 480.

Footnote: The MK1 cars have roof ventilators that put little bumps in the top of the profile. This raises the poly count, as shown below:

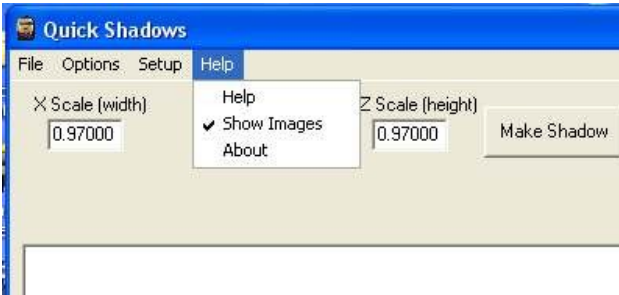


The longitudinal centreline plane is the lengthways profile of the entire parent object. If you enable the "Use Profile as Sides" option, the centreline profile plane will be placed along each side of the shadow and removed from the centreline. This option is good for making bogey shadows.

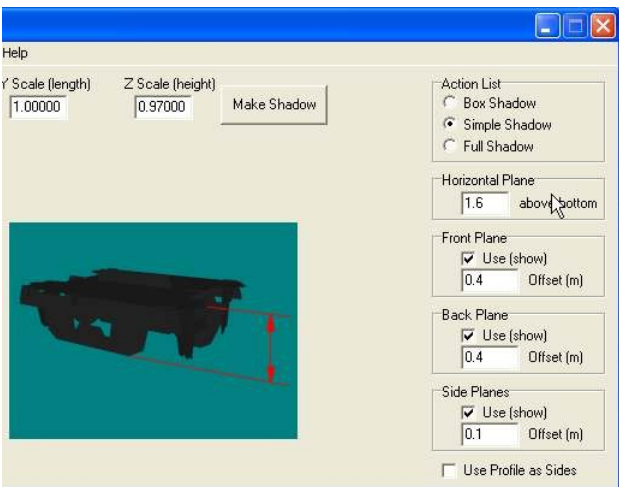


Altering the Side Planes Offset will adjust the location of these profile planes. (it will not affect the shape in this case)

The Show Images option in the Help menu turns on the display of images to illustrate the dimensions that are adjustable when offsets are altered.



Move the mouse over a box to see the image for that adjustment.



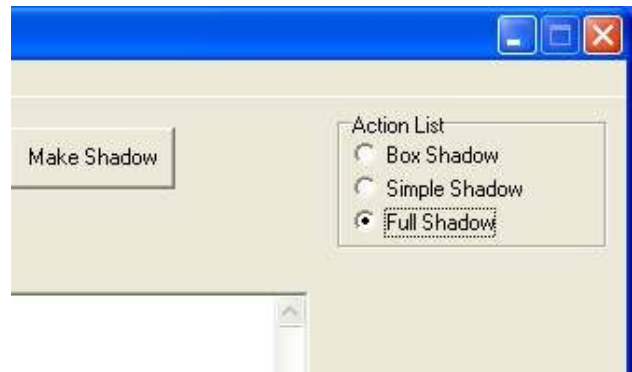
Files opened by double clicking in Windows Explorer can automatically have a shadow mesh created if the Auto Make option is checked. The program will close automatically after a short pause if the Close on Done option is checked.

The shadow mesh is created in the same folder as the parent mesh. It does not require any textures.

Making a Full Shadow

As in the previous shadow options, after opening the program will confirm your mesh choice and show a notice suggesting you press the "Make Shadow" button to proceed.

Choose "Full Shadow" from the Action List in the top right of the QuickShadows window.



On pressing the "Make Shadow" button a Shadow mesh will be created using the geometry of the parent mesh, but with all animation and texture details stripped out.

When completed the program will tell you that the shadow.im file has been created.

The full shadow mesh is created in the same folder as the parent mesh. It does not require any textures.

It's up to the user to place the shadow mesh in an appropriate folder and make any changes needed in the config.txt file.

Trawling.

Trawling is the process where the program searches a folder and ALL of its sub folders for mesh files that require a shadow mesh to be appended. It is similar to the search function in Windows explorer, except that when it finds a mesh file it processes it without asking any questions.

I added the trawling facility to QuickShadows to assist the team doing asset repairs for TS2009/10. There are many old rollingstock assets that don't have shadows and thus show an error in Content Manager 2 or 3

So if you have faulty content caused by the absence of shadow meshes (as flagged by the CM) you can use the CM search filter for faulty content and open it all for editing, then apply the trawling process to the editing folder.

To use Trawling you must launch this program from the command line with the `-trawl` switch, or launch from the Open With menu (right click) in Content Manager 2 or 3. If you include the `-close` switch as well the program will close immediately the TMI has finished building the mesh.

Select one or more items in Content Manager, then right click to bring up the menu. Select Open With, then click on QuickShadows.bat.

The selected items will be opened for edit and a shadow added for every PM, and optionally every IM, found in the search. Please be aware that only one shadow mesh per folder is created. If a folder contains a number of meshes, only one shadow will remain at the completion of processing that folder.

When trawling you can stop the process at any time by pressing the "Stop Trawling" button.

The files processed are listed in the main text box as the conversions progress.

The program keeps a log (named `Trawl_Log.txt`) of files found and shows the actions taken on each file. The log is accessed from the File menu and clicking on View Log. The log file accumulates data every time trawl is started. The Log should be deleted after large trawl conversions. A delete option is included in the File Menu.

Launching from the Command Line

The program can be launched from the command line to automatically make a shadow mesh based on a .PM or .IM mesh.

If the command line parameter is a mesh file the program will automatically open that mesh and use its dimensions to build the shadow mesh.

If the command line parameter is a folder the program will open in that folder and wait for the user to select a mesh to process to make a shadow. Use the File Open menu to select a mesh.

However because the shadow is a bit hit or miss, I think it's better to run the program from a shortcut and look at the result as you go along. You will most probably find that you have to displace the mesh to get the best result, and this cannot be done from the command line.

Program Options

The following options are provided to customise how the program works.

Auto Make

To make the program add shadows to PMs (and IMs) when started from the command line, set the Auto Make Option. The option will be ticked (checked) when set. This option has no influence on trawling.

Close on Done

The program will close on completion of the shadow making tasks if the Close on Done Option is set.

Trawl for IMs

Setting this option will make the program add shadow meshes to IM files as well as PM files, when trawling.

Shadow Name

Clicking on this option opens a dialogue window that allows you to nominate a new name for your shadow meshes.

Note: the name has no file extension (.im) This is added by the TrainzMeshImporter as part of the XML file conversion.

All meshes made after changing the name will have the new name.

Setup

The Setup menu offers selections to set up the OpenWith macros in Content Managers and to connect a Mesh Viewer program to QuickShadows to look at the shadow meshes produced so any adjustments can be made.

Open With

As already mentioned, if you choose Open With, the program scans your PC for Trainz installations. If it finds any in the default locations, the OpenWith macros are automatically installed.

If a default installation is not found, the program presents you with a Find Folder dialogue. If you do NOT have the Trainz version requested then press the Cancel button. Otherwise locate the TS2009 or TS2010 or TS12 application folder as requested and select it. The OpenWith macro will be automatically placed into the selected Trainz installation.

Mesh Viewer

QuickShadows can optionally call a Mesh Viewer so you can look at the shadow mesh generated to make immediate adjustments to the mesh. To enable the Mesh Viewer, select Mesh Viewer from the Setup menu and answer "Yes" to the "Do you wish to locate a Mesh Viewer..." question.

A File Finder dialogue is then presented to you. Locate your choice of Mesh Viewer program and click on the "Open" button. The program location is saved for future use. To have NO mesh viewer press the "Cancel" button.

TrainzMeshImporter

The QuickShadows program will not operate if the TrainzMeshImporter.exe is not in the QuickShadows.exe application folder. A notice to this effect is displayed for a few seconds before the program closes.

Also, TrainzMeshImporter requires some Microsoft C++ 2005 SP1 runtime files, and if these are not present the TMI will not run, or may freeze.

Refer to the program help if the TMI is not working correctly. A link to MicroSoft is provided in the help for downloading the runtime files.

INI File Options

The following extra options are available by editing the entries in the [Options] or [Simple] sections of the "QuickShadows.ini" file.

DeleteXML=1 makes the program delete the temp.xml file when the TMI closes. Change the 1 to 0 (zero) to retain the temp.xml file if you wish to inspect it.

DoubleSided=1 makes the "m.notex" material of the shadow mesh two sided, so the planes of the shadow mesh can be viewed from any angle in Trainz Mesh Viewer. Set this value to zero to see the true nature shadow mesh. Note that regardless of the DoubleSided setting, the planes of the mesh only cast a shadow from one side. (with the exception of the centreline plane of the Simple Shadow which is drawn twice so that it is opaque from both sides)

MakeWhite=0 makes the mesh ambient and diffuse lighting colour values mid grey. If the value is set to 1 the two colours are made white. This helps to make the different planes of the mesh distinguishable from one another when viewed in Trainz Mesh Viewer.

XIncrement=0.1000 (a value in metres) in the [Simple] section, is the size of the grid to which the X measurements (across the object) are clamped. The smaller the value the higher the polygon count in the finished Simple Mesh.

YIncrement=0.1000 (a value in metres) in the [Simple] section, is the size of the grid to which the Y measurements (along the length of the object) are clamped. The smaller the value the higher the polygon count in the finished Simple Mesh. (0.1000 metres is roughly 4 ins)

File=English.txt in the [Language] section of the INI file, controls the language of the text strings in the program. If you change the file name to "Deutsch.txt", the included German file will be used for the text. A new language file can be created from the English.txt file by translating it as directed in the file.

Disclaimer

PEV can accept no liability what so ever for any loss or damage to any data or hardware through the use or misuse of QuickShadows.

The program is provided free of charge and in good faith to assist the Trainz User Community.

The QuickShadows program cannot produce perfect shadows. It is a content creator's responsibility to provide appropriate shadow meshes to suit the target Trainz versions.

QuickShadows is offered as a way to repair content that is deemed faulty by the game or to provide a shadow for an asset where the shadow mesh is missing.