

PolyBump Previewer

(V2.92, last changes 02/11/2004 MM)

Polybump™

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Installation:

Start the PolyBumpPreviewerInstaller.exe and follow the on-screen instructions. After the installation has finished, you can start the application in the Start Menu under “Crytek/PolyBump Previewer”.

The evaluation version of the previewer may only be used for testing purposes. Once you are a registered user, you can use Polybump without any limitations. Take a look at the about box (in the plug-in) to get further details about how to become a registered user.

Requirements:

The Previewer makes heavy use of the latest 3D card capabilities. In order to run the previewer, it's mandatory to have at least pixel shader 1.1 support. The following graphic chipsets should work without problems:

- NVidia GeForce3
- NVidia GeForce4 (excludes MX Version)
- ATI Radeon 8500
- Matrox Parheila

Vertex shaders are used, but if support is not present they should be emulated in software. Make sure you have at least DirectX8.1 installed.

Features of the Previewer:

- 2 independent light sources (point or directional) but without attenuation and shadows
- Diffuse coloured light (result is affected by material diffuse colour)¹
- Specular coloured light (result is affected by material specular colour)
- Ambient coloured light (result is affected by material ambient colour)
- Two viewports with the same lighting and camera condition to compare different objects or shading modes
- Specular (or Gloss) mapping with the alpha component of the diffuse texture.

How to use the mouse interface:

Left mouse: To **rotate the camera** around the object hold down the left mouse button while you move your mouse.

Right mouse: To **move the camera** hold down your right mouse button while you move your mouse.

Middle mouse: adjusts the **camera distance**

Ctrl Key: To move the **first light source**, hold down Ctrl Key while moving your mouse.

Shift Key: To move the **second light source**, hold down Ctrl Key while moving your mouse.

Mouse Wheel: adjusts the **camera distance**

Keyboard Shortcuts:

F2: Cycle forward through the render modes of the main view.

F3: Cycle backward through the render modes of the main view.

Shift F2: Cycle forward through the render modes of the second view.

Shift F3: Cycle backward through the render modes of the second view.

F4: Cycle forward through the render modes of the main view and use the same for the second view.

Shift F4: Cycle backward through the render modes of the main view and use the same for the second view.

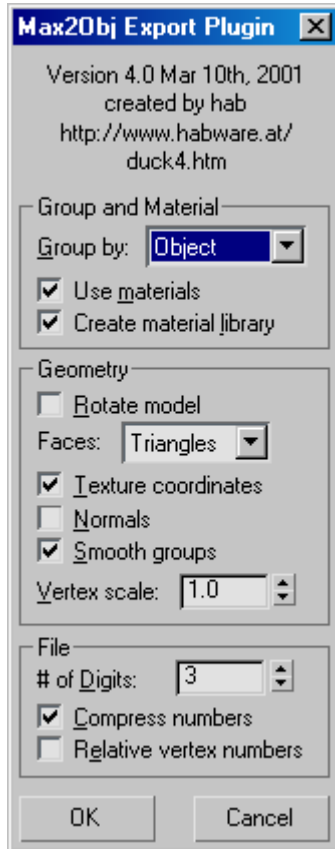
SPACE: Switch the second view on/off

¹ If you specify a texture map, the diffuse colour is used for tinting (multiply) the result. This behaviour is different from 3DStudio MAX.

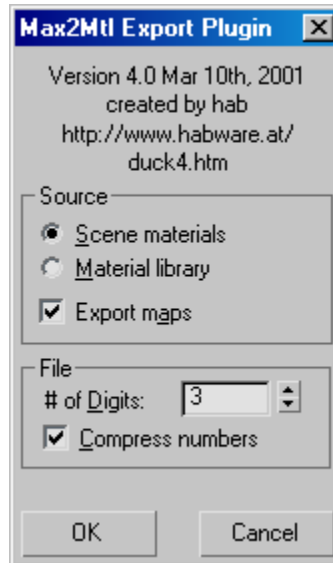
How to export a OBJ File from 3DStudio Max:

To export your 3DStudio MAX scene you could use the “OBJ Export” Button on the PolyBump Plugin panel (simplest way) or you use any OBJ exporter.

A free OBJ Exporter can be downloaded from www.habware.at.



These dialogs show the correct settings for exporting OBJ files for use in the previewer. If your objects are small, or have very fine details you might increase the number of digits. If you export the smoothing groups don't export the normals². For correct results you should export the smoothing groups but not the normals.



² You should export the smoothing groups to enable the previewer to recreate the normals (Max2Obj V4.0 doesn't export the normals correctly)

Supported Features of the OBJ Format (Object definition):

- Vertex position, texture UV and normal³
- Smoothing groups
- Material assignment per triangle
- Relative vertex numbers

Supported Features of the MTL Format (Material definition):

- Ambient material colour
- Diffuse material colour
- Specular material colour
- Diffuse texture
- Bump texture

Supported Texture formats (through DirectX):

- Targa .TGA
- JPEG .JPG
- Bitmap .BMP
- DirectDraw Surface .DDS
- Portable Network Graphics .PNG
- Device Independent Bitmap .DIB

Pixel colour is calculated with this function:

Colour = Ambient Part + [Diffuse Part] per light source + [Specular Part] per light source

Ambient Part = Scene Ambient * Material Ambient

Diffuse Part = Light Colour * Material Diffuse * Texture_{RGB} * Alpha

Specular Part = Light Colour * Material Specular * Texture_A * Beta¹⁶

Alpha = Value in the range 0..1 calculated with the light/surface angle

Beta = Value in the range 0..1 calculated with the eye/half angle vector

³ You should export the smoothing groups to enable the previewer to recreate the normals (Max2Obj V4.0 doesn't export the normals correctly)

Supported Bump Variants:

- Object Space:** Normal texture in object space (reuse only for translated faces)
- Tangent Space:** Normal texture in tangent space (reuse texture rotated/scaled/mirrored/translated, problems with bend surfaces)
- Clone Space:** Normal texture in object space. Additional .CLN file allows reusing the normal texture rotated/scaled/mirrored/translated like in Tangent Space

Explanation of the render modes:

Wireframe:

Simple wireframe with lighting

Gouraud:

Per Vertex calculated light without texture mapping, diffuse lighting only

GouraudSpecular:

Per Vertex calculated light without texture mapping, diffuse and specular lighting

TexturedFullbright:

Simple texture mapping without lighting

TexturedLit:

Simple Texture mapping with lighting

NormalmapFullbright:

Simple texture mapping of the normal map

PolybumpDiffusePixelShader:

Diffuse Dot3 bump mapping normalisation cube map

PolybumpSpecPixelShader 1 Pass:

Dot3 bump mapping with irradiance map (take a look at “Diffuse and Specular Per-Pixel Lighting” on developer.nvidia.com)

PolybumpSpecPixelShader CM 2 Passes:

Dot3 bump mapping specular and diffuse need one pass each. The normalisation cube map improves quality for point lights. A fixed power of 16 is used for calculating the specular.

Version History:

07/16/2002 V 2.00

First public build, Evaluation version on Crytek website

08/02/2002 V 2.10

Integrate displacement mapping output, changed colour scheme for tangentspace (Red => Blue)

09/05/2002 V 2.50

Changed colour scheme for also for clonespace and objectspace (Red <=> Blue), Major speed improvements

10/08/2002 V 2.52

Fixes rarely occurring endless loop (this could also cause artefacts)

11/12/2002 V 2.53

Fixed a bug that caused tiny holes in the output

11/21/2002 V2.6

The specified bump map now affects accessibility calculation,
Fixed bug that removes the mesh assignment,
Multiple selections for the high poly mesh

02/19/2003 V2.76

Additional bump map is now also affecting the accessibility calculation
Adjustable antialiasing and expand
Improved antialiasing, tangent space calculation and raycasting speed
New feature: export as OBJ, multiple selection for the high poly mesh
Fixed bug that removed the mesh assignment
Fixed bug in loading the grayscale tga files

04/29/2003 V2.9

Improved tangentspace calculation (mirror seams are now almost invisible)

05/09/2003 V2.92

Fixed bug in mesh generation, now high polygons are faster (again?)
Statistic data is now from used mesh, no longer from OBJ input

Hints:

- The previewer automatically adjusts camera distance and light distance to fit the main and second views. To get a good result make sure the objects loaded are located at similar world space positions.
- Due to a fixed z-buffer resolution, your object shouldn't be too large.

How to contact Crytek:

Crytek GmbH
Rosenauer Str. 16
96450 Coburg
Germany

www.crytek.com

If you have any question regarding PolyBump please contact polybump@crytek.de
