

Saints Row 2 peg texture tool user's manual

version 1.26

sr2pegtool.exe supports peg_pc, gpeg_pc, dds(DXT1, DXT3, DXT5, A8R8G8B8, R5G6B5) and 24bit(RGB) or 32bit(RGBA) png file.

The maximum texture size that can be compressed with DXT is 2048x2048.

1. Unpack textures

Place <name>.peg_pc and <name>.g_peg_pc in same folder.

Drag peg_pc file and drop it on sr2pegtool.

sr2pegtool makes <name>_extracted folder and unpacks texture files into this folder like as follows.

<name>.peg_desc peg description xml file.

<texture_name>.png exported texture image.

<texture_name>.dds direct draw surface file that was added the appropriate DDS header to the internal texture data.

2. Replace textures

All you need to do is only replace the png file.

You do not need to edit the peg_desc file, except for the special case.

DDS file

You don't need to remove the DDS file except when you want to force a re-compression. sr2pegtool will compress to a DDS file only when the PNG file has been changed.

PNG to DDS conversion rules in v1.105 or later.

1. When PNG file is newer than the DDS file, sr2pegtool always convert the PNG to DDS.
2. Sr2pegtool always convert the PNG to DDS when DDS file is not exists.
3. When there is a difference between the described image size in the peg_desc file and the actual PNG image size, sr2pegtool always convert the PNG to DDS. In this case the size of the PNG image has priority.

Mipmaplevel

In general, A8R8G8B8 and R5G6B5 format texture does not include a mipmap. Basically, the texture of the DXT format contains the mipmap. However in few case it might be better to not contain a mipmap.

Note:In general, mipmap level starting from 0(original size), but starting from 1 in the peg_desc file.

Rules for generation of mipmap that has been improved in version 0.92b.

When MipmapCount value that described in <name>.peg_desc file is set to 101, sr2pegtool generates a DXTC texture without mipmap.

If you want to set the upper limit of Mipmap level describes the mipmap of upper limit + 100 to MipmapCount.

for example

```
<MipmapCount>101</MipmapCount>    no mipmap
<MipmapCount>103</MipmaCount>      mipmap upper limit to 3
```

Important changes in version 1.100 or later

Some of the SR2 texture has limited mipmap level. The reason for limiting the mipmap level is unknown, but there is a possibility that problems may occur when a new texture is not the same mipmap level as the original.

When you unpack the texture in version 1.100 or later, it is checked whether or not there is mipmap level limitation, and that accurately reflects in the peg_desc file.

For example.

Usually 256x256 texel image's mipmap level is 7 (in SR2 Engine).

L1:256x256, L2:128x128, L3:64x64, L4:32x32, L5:16x16, L6:8x8, L7:4x4

In the case of earlier than version 1.100.

```
<Width>256</Width>
<Height>256</Height>
<Format>DXT5</Format>
:
<MipmapCount>3</MipmapCount> (Limit has not been reflected)
```

In the case of version 1.100 or later.

<Width>256</Width>

<Height>256</Height>

<Format>DXT5</Format>

:

<MipmapCount>103</MipmapCount> (Mipmap level is limited to 3)

Default mipmap generation settings in sr2pegtool.ini

From sr2pegtool v1.26 DXT compression of textures with mipmaps uses Microsoft's texconv.exe. texconv.exe is under MIT license.

In consideration of compatibility, GPU computing and mipmap generation by Windows Image Components (WIC) are not used, but DXT compression by CPU and built-in resize filter are used.

For opaque texture (DXT1)

resize_method = BOX_DITHER_DIFFUSION

colour space = sRGB

For transparent texture (DXT3 or DXT5)

resize_method = BOX_DITHER_DIFFUSION

colour space = sRGB

For normalmap or tgn texture

resize_method = BOX

colour space = LINEAR

About image reduction algorithm for mipmap generation in sr2pegtool (texconv.exe)

LINEAR: The result is probably equivalent to BOX.

CUBIC: A reduced image with higher quality than the average filter can be obtained. Calculate 4×4 pixels of the original image to obtain one pixel of the reduced image.

FANT: Unknown. The result is probably equivalent to BOX.

BOX: The most common algorithm used when generating mipmaps. It is a simple but effective way to make the average colour of 2×2 pixels of the original image to one pixel of the reduced image.

TRIANGLE: The result is equivalent to BOX.

POINT: A method of selecting one out of four pixels of the original image to make it one pixel of the reduced image. Reduced images are jaggy, but since it uses the original image's color as it is. This filter is useful for textures with very specific color patterns, but is rarely used.

3. Re-package textures

Drag <name>.peg_desc file and drop it on sr2pegtool.
sr2pegtool makes <name>_rebuild folder and re-package textures to
<name>.peg_pc and <name>.g_peg_pc file.

You can specify the detailed parameters in the sr2pegtool.ini files to generate
mipmap.

From v1.2, it is now possible to automatically determine the type of texture and
set the corresponding parameters.

4. DDS file converter

Drag png file and drop it on sr2pegtool.
You can set the parameters for the resize in order to obtain a better mipmap
image.

Specify a DDS image format

> 1:DXT1 3:DXT3 5:DXT5 a:Auto 0:exit

> ?

(Auto: no alpha image to DXT1, image with alpha is set to either DXT3 or DXT5
by comparing the PSNR.)

Select resize filter

> Resize Filter.

> 1:LINEAR 2:CUBIC 3:FANT 4:BOX 5:TRIANGLE 0:Exit

> ?

Select resize filter dither

> 1:Filter without dithering 2:Filter with dithering 0:Exit

> ?

Select resize filter diffusion

> 1:Filter without diffusion 2:Filter with diffusion 0:Exit

> ?

Other parameters are determined according to the description in the ini file.

sr2pegtool is automatically set the resize method and other factor when the source image is DXT1-Normalmap or DXT5-tgn.

5. DDS file viewer

Drag dds file and drop it on sr2pegtool.

You can change background color by click the image.

Background is changed checkerboard, white, in the order of black.

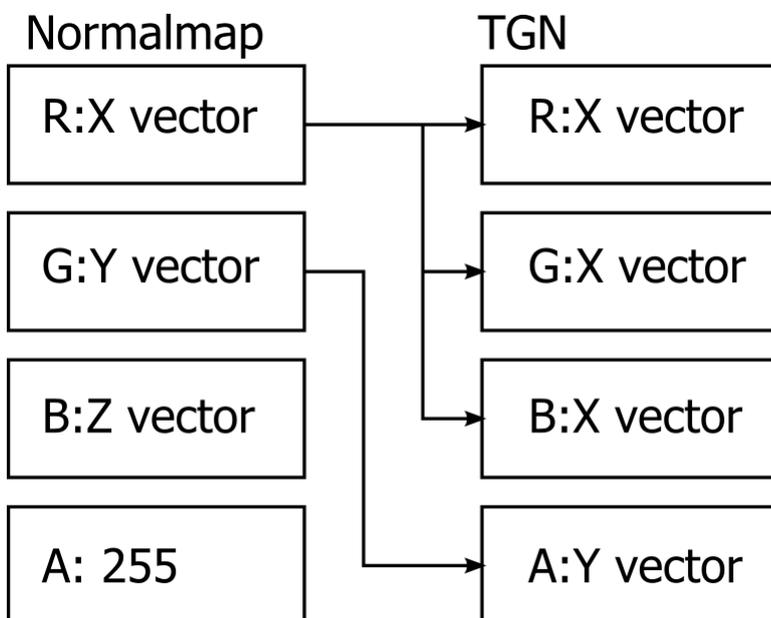
To exit, close window or press ESC key.

6. Normalmap to TGN conversion

Drag png file and drop it on sr2pegtool

This transparent normalmap texture seems SR2 engine-specific format.

Please note that the Z-axis value is lost and it not correctly rendered when convert the objectspace normalmap to tangentspace normalmap.



7. gpeg_pc direct texture viewer

Place <name>.gpeg_pc and <name>.peg_pc in same folder.

Drag <name>.gpeg_pc and drop it on sr2pegtool.exe.

Or, double click <name>.gpeg_pc and open it with sr2pegtool.exe.

2020/01/20

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Version History

2020/01/20 v1.26

DXT compression of textures with mipmaps uses Microsoft's texconv.exe. texconv.exe is under MIT license.

In consideration of compatibility, GPU computing and mipmap generation by Windows Image Components (WIC) are not used, but DXT compression by CPU and built-in resize filter are used.

2019/11/04 v1.25

Fixed a bug that the resize filter specified in the INI file is not reflected correctly.

2019/07/31 v1.24

Fixed the problem that exe file needs external dll file.

2019/05/17 v1.23

FreeBasic compiler version updated to 1.06.0 and now it's a part of MinGW-w64 toolchain.

The integration of MinGW-w64 and FreeBasic eliminated the need for external dll files.

The source code of the program is the same as v1.22.

2018/03/23 v1.22

Updated the squish library to v1.15, greatly improving DXT compression speed by multithreading.

Mipmap generation became an external library written in C++, and the image reduction speed was improved.

Added an adaptive reduction method which improves nearest neighbor method to image reduction algorithm.

2017/05/08 v1.21

Simple gamma correction at mipmap generation was canceled, and mutual conversion between sRGB color and linear RGB color was implemented. Although this requires more processing time, it promises to generate high-quality mipmaps regardless of the luminance distribution of the original image.

Texture images other than the normal map are converted from sRGB color to linear RGB color at the time of mipmap reduction, further converted to YCbCr color space and then reduced.

When converting the reduced YCbCr color image to linear RGB color, the mipmap image becomes slightly darker than the original image by multiplying the double precision Y value by 255 and truncating the decimal point and dividing by 255. This is a simple but very effective way.

2017/03/28 v1.20

Change method of endpoint processing in image reduction for mipmap generation.

Improve processing speed of image reduction.

Change the description of ini file to XML format.

2016/05/01 v1.106

Fix an issue that a lower right one dot in the image is not handled correctly at the DXTC decompression.

Recompile the libsquish.a library.

2016/03/20 v1.105

Implement Average, Bicubic, Lanczos3 and Nearest neighbor method as resizing algorithm to generate the mipmap.

Detailed settings by the description of the sr2pegool.ini file is ready.

DXTC compression is now faster than the previous version.

2016/01/30 v1.103

Fix bug that normalmap to tgn conversion not work.

2015/12/19 v1.100

Improvement to accurately reproduce the mipmap level limitation.

2015/12/06 v1.021

It became a 64-bit application. (32-bit OS is not supported)

SSE2 instruction set support.

Improvement of the PNG file reading speed.

Improvement in some of the filter processing speed.

Fixes some minor bugs.

2015/05/14 v0.971

Fix random crash in gpeg_pc viewer mode.

Change compression options of libsquish to squish_kColourIterativeClusterFit.

The best image quality is obtained, but the compression rate was slower than the previous version.

2015/05/08 v0.97

SSE instruction set is now available in this version.

2015/04/17 v0.96

Supports texture with multiple frames.

SSE instruction set is not available in this version.

2015/04/13 v0.95

Fix an issue that is not processed correctly if you set the MipmapCount to 0.

Problem to crash if you have selected the 0:auto in the PNG to DDS file conversion has not been fixed.

2015/03/25 v0.94

Now sr2pegtool support SSE instruction set. DXTC compression speed is greatly improved.

2015/03/15 v0.93

Add some new rules to convert the PNG image to DDS when you re-package the texture.

2015/02/07 v0.92b

Add a way to create a DXTC format texture without mipmap.

2015/02/06 v0.91b

Add R5G6B5 format support.

Fix mipmaplevel calculation bug and minor bug around PSNR evaluation.

Modified to be recompressed even when the DDS file is deleted.

Change DDS Viewer window design.

Display image format name in texture viewer mode.

2015/01 v0.90b

First Release