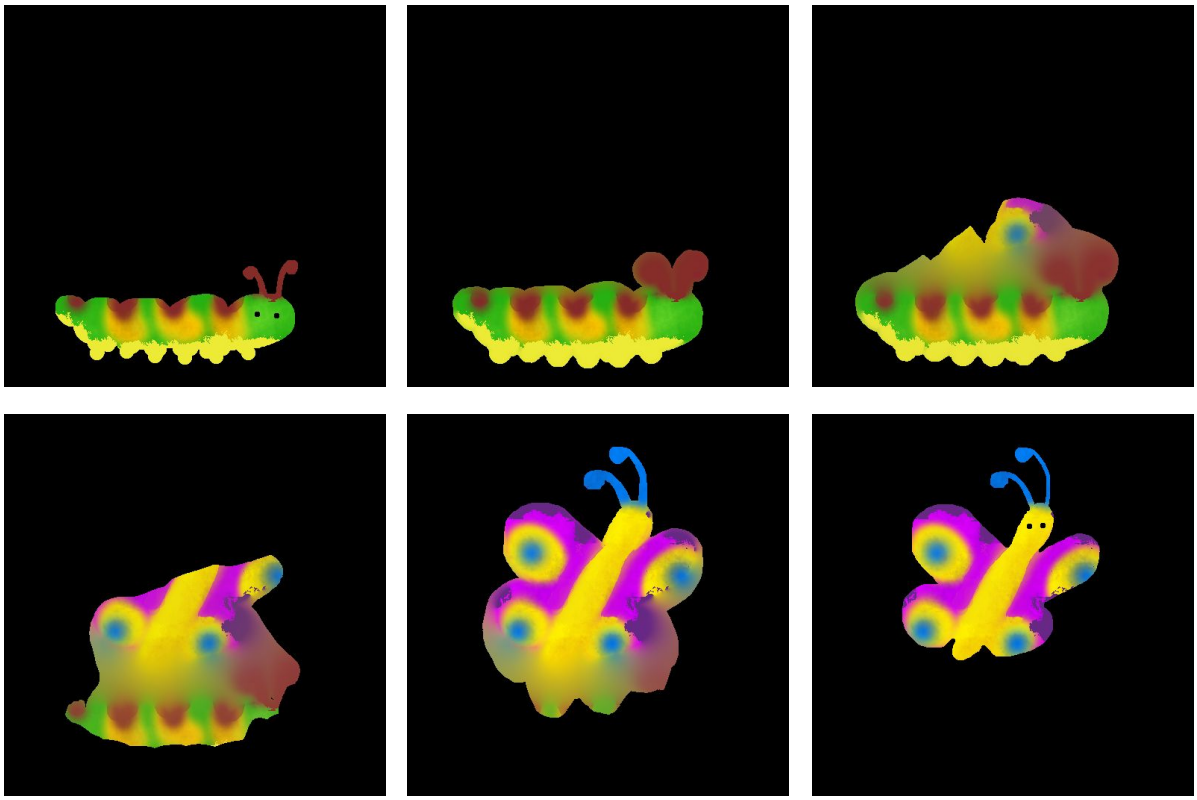
Spacetime_Blend User Manual



About

Spacetime_Blend is capable of blending between 2 input images. They should be PNGs with a pure black background to define a mask. The program will take these images and user input and create a series of images that blend between them.

A full “Options Guide” can be found at the end of the manual.

Installation

Spacetime_Blend has dependencies on *NGL* and *SDL*, both of which must be installed for compilation, or the executable for Linux can be downloaded from Github. The source code and the Linux program is available at https://github.com/i7621149/SDL_spacetime_blend.
QMake is also required for compilation.
To compile Spacetime_Blend, open a terminal, navigate to the source directory and run:

$ qmake
$ make

This should create an executable called “SDL_spacetime_blend”.

Usage

Open a terminal. Navigate to the source directory and run:

$ ./SDL_spacetime_blend

In order to run the base program. This will run an animation of a blend between the input images.

The images are located in the downloaded directory at:

in/img1.png
in/img2.png

In order to use different images, it is recommended that these images are edited by the user, using Photoshop, GIMP, or similar image editing software. The images should be saved with the same format, name and location.
Back-ups of the input images *img1.png* and *img2.png* can be found in the folder “textures”.
If the user edits the image size, it is recommended that they run the program using the following parameters:

$ ./SDL_spacetime_blend -w XXX -h YYY

Where XXX and YYY should be replaced with the new width and height respectively, since the default size for the program is 512x512.

Color Blending

It is recommended that the user runs the program using the default white blend, since this will allow them to preview the shape of the blend, and it is much faster to compute than using a blend operation.

Once the user is happy with the shape of the blend, the following options are available using “-d” for DRAW:

$ ./SDL_spacetime_blend -d blend

> This will use a weighted average of the colours in the input images to calculate a new colour in any area where the colour is not defined in the input. The weighted average is the total sum of all known colours, weighted by their distance:
>
> W = 1/(d^k)
>
> Where k is a constant. In the current implementation of the program, k = 4, as this produces more pleasing results than W = 1/d.

$ ./SDL_spacetime_blend -d closest

> This is a simpler implementation, where undefined pixel colours are set equal to the closest pixel defined by the input texture. This creates a line or fan effect away from the surfaces of the input images. It is less smooth than the weighted average but may be desirable in some cases. The colours still smoothly blend between the two inputs.

“-d white” is also valid, but will perform the default operation, where white is used to preview the shape of the blend to the user. Using -b can also be used to preview the shape faster, with an impression of the final colour.
“-d block” is also valid, but will only use the colour from the two input images, including black space in between and is not recommended.

Texture Blocks

Rather than using the full high-res texture, the user can preview the blend with a lower resolution for the blend, which will give a result faster by using a texture with the specified size BLOCKS:

$ ./SDL_spacetime_blend -b 10

> This uses the texture at a 10th of the resolution for the blend. Smaller numbers such as 2 or 3 will likely give a reasonable output at a considerable performance boost, depending on the images and desired quality.

Colour Spaces

Using “-c” for COLOUR allows for the following:

$ ./SDL_spacetime_blend -c rgb

> This is the default behaviour, where colours are blended in the RGB colour space.

$ ./SDL_spacetime_blend -c hsv

> This allows for colour blending in the HSV colour space and can cause strange and unintuitive results depending on the input colours, although may be desired in some circumstances.

Setting Number of Frames

The default number of frames is 100. To set this to a different value, “-n” for NUMBER can be used:

$ ./SDL_spacetime_blend -n 10

This will create a series of 10 frames as the output, rather than 100. The user should be aware that most of the blend takes place in the middle of the animation and since calculated colour is cached for later frames, the most expensive calculations are still taking place at lower numbers. 50-200 frames is recommended, although 20-400 frames can still produce pleasing results, depending on the input images' shape and size.

Saving Images

Using "-o" for OUTPUT allows saving images:

$ ./SDL_spacetime_blend -o filename

The filename will be appended by "#####.bmp" where "#####" is the frame number.

Setting Control Parameters

As outlined in *Real-Time Space-Time Blending with Improved User Control* (Paskov et al.), there are user variables that can change the shape that the blend creates. These variables, a1, a2, a3, a4, can be set using the file:

config.txt

Which can be found in the same directory as the main program. For information on how these variables affect the blend, refer to *Real-Time Space-Time Blending with Improved User Control* or experiment with values to see the effects.

Full Options Guide

-b Set texture Block size
-c Set COLOUR space
-d Set DRAW mode / blend mode
-h Set HEIGHT of output, recommended if input image height is not 512px
-n Set NUMBER of output frames
-o Set OUTPUT filename to save images
-w Set WIDTH of output, recommended if input image width is not 512px

config.txt
Used to set user controlled parameters of the shape of the blend, a1, a2, a3, a4