Synfig Studio

Initial Alpha Test Documentation and Tutorial

About the user interface

When you start Synfig Studio, it will display a splash graphic and boot itself up. After it finishes loading, you should see three windows. **INSERT SCREENSHOT HERE** The window in the upper left is the *toolbox*. This is where you can open files, change tools, etc. You'll notice that most of the buttons are greyed out--because there is no file open yet.

The other two windows (one on the bottom, and one to the right) are customizable dock dialogs. You can rearrange the contents of these however you wish by simply dragging the tab to where you want it. You can even create a new dock dialog by dragging a tab out of the dock dialog it was inside of.

If you ever accidently close a dock tab (by dragging it out of the dock dialog, and closing the new dock dialog that gets created), no worries. Simply goto the toolbox and goto "File->Dialogs", and then click on the name of the dialog you need.

There are a lot of "tabs". If you have no idea what a tab does, simply hold your mouse over its icon and a tooltip will pop up describing the name of the tab.

Here are some of the more important ones:

* Layers - This tab shows you the layer hierarchy for the currently selected canvas. It also allows you to manipulate these layers.
* Params - This tab will show you the parameters of the currently selected layer, (OR, if multiple layers are selected, it shows you only the parameters that the selected layers have in common)
* ToolOptions - Shows you any options specific to the currently selected tool
* Navigator - Shows you a thumbnail of what the currently selected Canvas looks like. You can also zoom in and move the focus around with this tab.
* History - Shows you the history stack for the current composition. You can also edit the actions in history.

If you click the "new composition" button in the toolbar, a new composition will be opened and the canvas properties dialog will appear. **Insert screenshot here**

The canvas properties dialog is a mess, I know. I'll have it re-designed into something much more comprehendible in the next few days. For now, ignore the "Image Area" and "Locks and Links" sections.

If you click OK, the canvas properties dialog will disappear and you will see the Canvas window. This window represents the *Root Canvas*, not that that means much to you at the moment, but that's OK--I'm just trying to show you around.

In the upper left corner of the Canvas Window, you'll see a button with an arrow. If you click on this button, the canvas window menu will pop up. (As an aside, if you right click in the canvas area and there is not a layer under the mouse position, this menu will also appear) So now you know where the menu is in the Canvas Window. Good. Everything else should be pretty self-explanatory in the Canvas Window. (Explanations on the menu stuff is to come in a sec)

Synfig Concepts

Synfig, like most every other competent graphics program, breaks down individual elements of a Canvas into *Layers*. However, we differ from other programs in two major ways:

1) An individual layer in Synfig usually represents a single "Primitive". ie: A single region, an outline of a region, an imported JPEG, etc... This allows you to have a great deal of flexibility and control. It is not uncommon for a composition to have hundreds of layers(organized into a hierarchy for artist sanity of course).

2) A layer can not only composite information on top of the image below it, but also distort and/or modify it in some other way. In this sense, Synfig Layers can act much like Filters would in PhotoShop. For example, we have a Blur layer, Radial blur layer, Spherical Distortion layer, color-correct layer, bevel layer, etc...

Each layer has a set of parameters which determine how it behaves. When you click on a layer (either in the canvas window, or in the layer tab), you will see its parameters in the param tab.

Tutorial

Lets create something so that we can tweak with it. Now that you have a new composition open and the properties dialog is out of the way, go over to the toolbox and click on the circle tool(If you don't know which one it is, just mouse over them until you find the one with the tooltip that says "circle").

The second you click on the circle tool, you should notice that the tool options dialog changed. But we'll get to that later.

With the circle tool selected, you can now create circles in the canvas window. This pretty much works exactly as you might expect it to. Go ahead and create two (or more, if you fancy) circles.

Now go back to the toolbar and click on the "normal" tool (the blue circle with the arrow on it). After you do this, click on one of your circles. You will then see a bounding box(which is kinda useless at this point in time, but I digress), a green dot at the center, and a cyan dot on the radius. Those dots are called *DUCKS*. If you want to modify the circle, grab a duck and drag it around. Easy!

So you can select a layer by clicking on it. If you want to select more than one layer, hold down CONTROL while you are clicking--this works in both the canvas and the layer tab. Try it!

You can also select multiple ducks. You can do this in several ways. First, you can hold down CONTROL and individually click the ducks that you want selected, but this can be tedious. However, there is a much faster method--just create a selection box by clicking the mouse and dragging it over the area of ducks that you want selected.

Go ahead and select two circles, and select all of their ducks. With several ducks selected, moving one duck will move all of the ducks. This behavior is dependent on the *normal* tool. Thus, a more descriptive name for this tool might have been the "move" or "translate" tool.

The *Rotate* and *Scale* tools work much like the *Normal* tool, except in the case where you have multiple ducks selected. It is much easier to just try it than read about it. Select a few circles, select all of their ducks, and try using the rotate and scale tools.

Note that, unlike the *normal* tool, the other duck manipulation tools DO have options associated with them. If a particular tool isn't doing what you want, take a look in the tool options tab to see if it is set up like you want it.

Now lets try linking. Lets say we always want these two circles to be the same size. Select two circles, and then select both of their Radius ducks(the cyan dot). Then right click on either duck and a menu will pop up. Click on "*Link*". Boom. The parameters are linked together. You can prove it to yourself by selecting just one of the circles and changing its radius--the other one will change as well. Neat stuff, eh?

Linking is a fundamental concept in Synfig. You can create links not only between ducks, but also between parameters as well by selecting multiple layers, right clicking on the parameter in the param tab, and selecting "*Link*".

DIGRESSION: This is how outlines are attached to their regions--but I'm getting ahead of myself. At the moment, the fundamental power and flexibility of linking in Synfig Core is beyond what Synfig Studio currently allows for. This will change in the future. Anyway, back on track...

Lets say you want one of the circles to be a different color. If you look in the toolbox below the tools, you'll see the foreground/background color selector, the outline width selector, and some other stuff like the default blend method and gradient. The foreground/background color widget works exactly as you might expect--you can click on the foreground color, and a modest color chooser will appear. Now to can change the color pretty easily.

But sometimes you just want to click on a color and go. This is where the palette editor tab comes in. It's functionality isn't quite 100% yet (ie: saving and loading custom palettes hasn't been implemented yet), but the default palette is pretty decent. Click on the Palette editor tab and have a look--it's the one with the palette-ish looking icon. Clicking on colors in here will immediately change the default foreground color.

That's all great, but we still haven't changed the color of the circle. There are two ways to do this. The first way is that you select the circle layer you want to modify, goto the params tab and double click on the *color* parameter--a color selector dialog shows up and you just tweak away. But lets say you already got the color you wanted selected as the default foreground color. Easy. Just click on the "Fill tool" from the toolbox, and then click on the circle in the canvas window. Boom. Circle changes color. This works with more than just circles, but we'll get to that in a sec.

Try playing around with the circles for a bit. Muck around with the parameters, and see what happens. To get you started, play around with feather a bit.

Ok, circles are all great and stuff, but they are pretty much geometrically inflexible. What about shapes? To do this, we use the Bline tool.

When you click on the Bline tool, you will see that the ducks from your currently selected layer(if there was one) will disappear, but the layer(s) will still remain selected in the layer tab. This is normal. Anything you create in the Bline tool will be inserted above the currently selected layer. Keep in mind that if you want to insert a shape somewhere, you should select where you want to insert it before you go into the Bline tool--changing the selection afterward will automaticly swap you back to the normal tool.

But anyway... Shapes. In Synfig, the construct for describing shapes is called a Bline. This is roughly analogous to a "path" in other programs, except that it is strictly a hermite spline.

If you take a look at the tool options tab, you'll notice that the first things you see are three checkboxes. Make sure that only "Fill" AND "Outline" are checked.

First, go ahead and click on the "R" button in the lower left corner of the FG/BG color widget in the toolbox. This will reset us back to black and white. Also, go ahead and set the default line width (right next to the FG/BG widget) to something nice and

thick--10pt should do the trick.

Clicking with your mouse in the canvas will place vertices. While you are placing a vertex, you can drag out its tangent by dragging the mouse. Do this over and over, and you construct a Bline.

KEEP IN MIND that during this construction, if you don't like where you placed a vertex or a tangent, there is nothing stopping you from just moving it. Honest! If you want to remove a vertex, right click on it and delete it. Want to split the tangents? Right click on the tangent and hit "split tangents". Want to loop the bline? right click on the first vertex and select "loop".

So I assume you got your first Bline laid out like you want it. That's great. But we are still in construction mode--the layers haven't been created yet. There are two ways to create the layers, 1) just switch to another tool. 2) press the "create" button at the bottom of the tool options tab(it's the icon that looks like a gear).

For now, just go ahead and click on the Normal tool because we are done with the Bline tool.

Ok, we now have a nice pretty white region with a thick black outline. Notice that there are two layers that we have created--the Outline and the Region. Despite the fact that they are two separate layers, their vertices parameter has already been linked--so you can select either one and move its ducks around and the other one will also change.

If you want to manipulate the vertices after you have created the layers, it is very easy to do so. Just click on one of the layers and have at it. If you want to remove a vertex, right click on it and hit "Remove Item (smart)". Want to insert a point somewhere? Right click on the segment where you want to insert something and his "Insert item (smart)".

NOTE: The only major difference between this normal editing mode and the construction mode is in how you split the tangents--in construction mode you right click on the tangent itself. In normal duck editing mode, you must right click on the vertex that the tangents are attached to. This could be considered a usability bug, and it will be resolved at some point.

I know what you are thinking. This is going to lead to a mess of layers. And yes, if you aren't using the software properly, that is exactly what you will get. But there is a way to make this more sane.

We can logically think of the Outline and it's Region as a single "object". Referring to it with separate layers is clumsy. What we really want to do is refer to this as a single layer that we can move around a bit easier--perhaps give it a name.

To do this, we select both the outline and the region layer and then right click on them in the layer tab. A menu will pop up--select *encapsulate.* You will then see that the two layers have been replaced by a new layer with a "box" as an icon called "inline canvas".

We can then treat this layer like any other layer--we can move it around, duplicate it, copy and paste it. You'll notice an arrow next to the icon of the box. By clicking on this arrow, you can expand the inline canvas to see its contents.

If you want to change the name of it to something more descriptive, just select the layer in the layer tab and click on its label. Then you just edit it in place. You can do this for ANY layer, and are strongly encouraged to do so.

If only for it's organizational capability, *encapsulating* canvases into *inline canvases* dramatically improves the usability and usefulness of Synfig Studio. But lots of programs can do this. What sets Synfig apart from other programs with layer hierarchies is the concept of *locality*. Remember how some layers can muck with what is under them, like blur? Well, a layer can only modify the data that it gets from directly below it. In other words, if you were to throw a blur layer at the top of that inline canvas we just created, the only thing it would blur would be the region and outline that are inside of the inline canvas--the circles under it would not be blurred!

Lets try it. Make sure all the circles are under the inline canvas we just created. Expand the inline canvas to show its contents, and select the top layer inside of it (should be the "Outline" layer). This is where we want to insert the blur. Right click on the selected layer and a popup menu will appear. The first item in that popup is "New Layer". Inside of the "New Layer" menu, you'll see several categories of layers you could create, but what we want is a blur, so goto the Blur category and select the "Blur" layer. (so that would be "New Layer->Blurs->Blur")

Well, it blurred... but something is not quite right--the inside edge of the outline is now all soft, but it still kinda looks like there is a hard edge on the outside. It is doing this because the blend method of the blur defaulted to "composite" (you can change the default blend method for new layers from the toolbox). What we want is a blend method of "Straight". Just select the blur layer, and change the blend method to "straight" in the params tab.

(NOTE: I will probably change the way that default blend methods are handled in the future--as the way it is currently handled seems to only create hassles like this)

Ok, now we have all of the contents of the inline canvas blurred, but everything under it is sharp!

One quick thing to mention before I finish up. You can change the width of an outline at each vertex. You do this by selecting the outline layer (NOTE: selecting the region layer won't work, you must select the outline layer) and tweaking with the

width ducks. The only problem is, where are the width ducks? by default, they are *masked*. To toggle width ducks, press ALT-5. You can also see other things to mask via the CanvasWindow->View->MaskDucks menu.

That should give you enough of a grasp of the software to be able to figure out more stuff on your own.

Other Notes

Synfig Studio has an autorecover feature. If you are working on something that you haven't saved for a while and the program crashes, you will not loose more than 5 minutes of work. Simply restart Synfig studio and it will recover the unsaved changes. Unfortunately history isn't recovered yet. That feature comes later.

One thing you may notice is that Synfig Studio is **SLOW**, making it practically unusable on hardware that is over 3 years old. The biggest reason for this is that all of the color calculations are done in floating point--because Synfig Studio was built from the ground up with High-Dynamic-Range Imaging in mind. HOWEVER, this will not be the case forever.

I have some fairly major re-implementations and optimizations that I am about to implement that should quite dramatically improve the performance of Synfig on all platforms. My goal is not a 200% speed increase, my goal is *at least* a 2000% speed increase. With the optimizations that I plan to implement, I will be able to pipeline operations in such a way that this performance improvement can be realized. It should also pave the way to hardware acceleration using todays powerful graphics processors, which should yield further performance improvements measurable in orders of magnitude.

I think that about does it for now. There is TONS more stuff, and I haven't even talked about animation yet. More to follow...