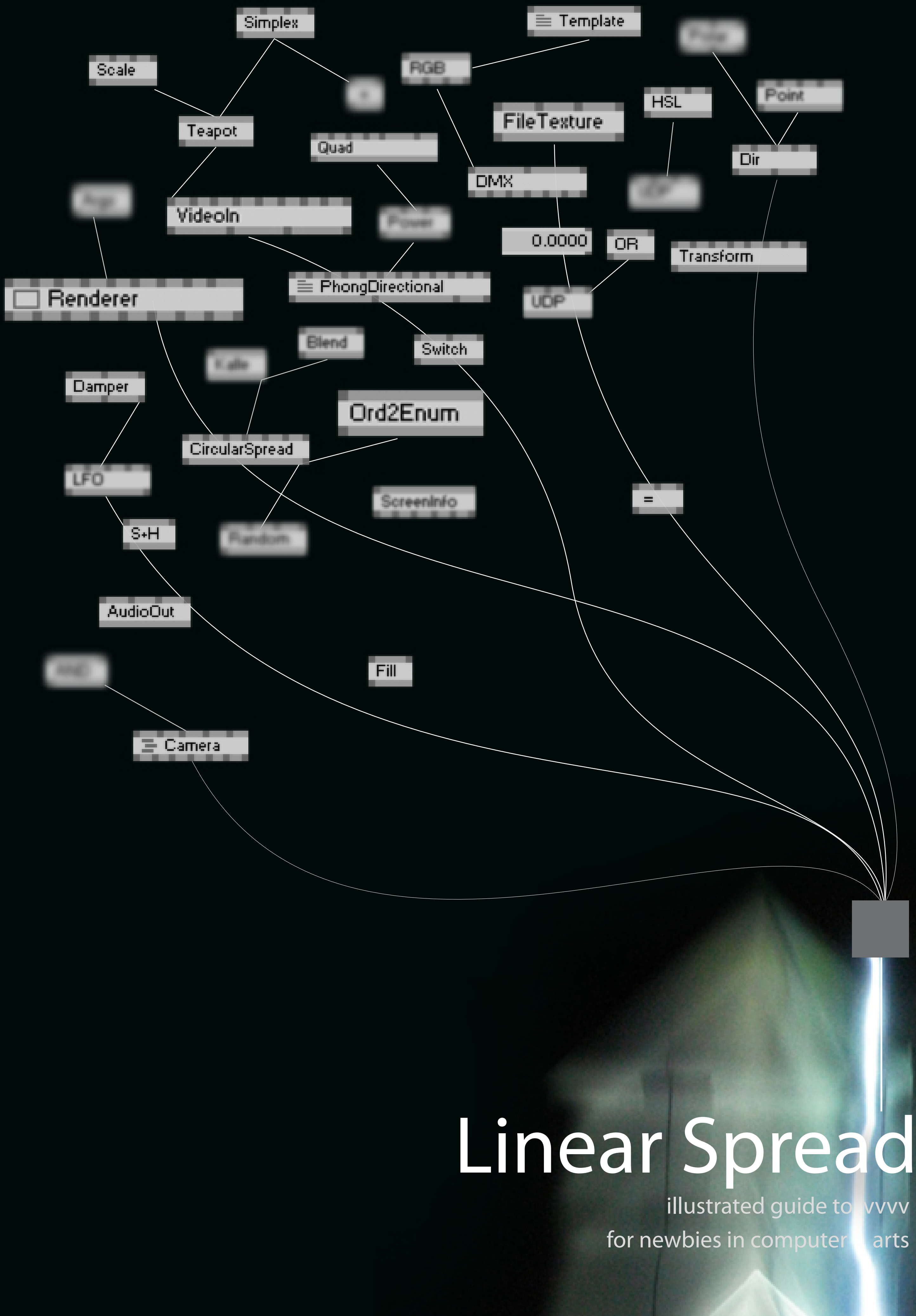

Linear Spread

illustrated guide to vvvv

for newbies in computer arts

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introduction bla-bla-bla

why should I use vvvv?

call yourself
a 'media artist'

enough to make
complex things

enough to make
beautiful things
in 3d space

before becoming much
more advanced, you may
want to spend 20 minutes

appendix

to print pages 37-43
and keep them
near you to you.

introduction bla-bla-bla

vvvv
a multipurpose toolkit

vvvv is a graphical programming environment for easy prototyping and fast development. It is designed to facilitate the handling of large media environments with physical interfaces, real-time motion graphics and audio and video that can interact with many users simultaneously.

The VVVV Group is responsible for its continuous development.

http://vvvv.org/

http://vimeo.com/channels/vvvv

The vvvv channel on Vimeo is a showcase of work produced by vvvv users. Seeing the power of vvvv will explain it better than a thousand words ever can

vvvv is for Windows only
Because it is using the power of DirectX, to run vvvv you need either WindowsXP, Vista or 7, the lastest DirectX Redistributable and .net3.5 installed .
To run vvvv on Mac, you need to run Windows via BootCamp.

vvvv not suitable for following tasks:
you can not force vvvv to run patches inside a web browser, and you cannot compile vvvv projects into self-running .exe files. You always need a copy of vvvv itself running.
If this is a requirement for you, then you should consider searching for other tools.

about this guide

This is very first offline and experimental version of a vvvv guide.
It made for people who have never used any programming languages before
to create motion design, generative art objects or user interaction installations.
We have made a very brief overview of vvvv. By reading this guide you will
understand the main concepts of vvvv, but not in detail, or advanced usage.
To find a more complete explanation and learn vvvv in detail, please follow
the links provided on most pages.
Reading this guide should take about 20 minutes. It's all time you need
to understand one of most powerful software packages for createing interactive
installations and generative art.
Please note, this is not official guide. The vvvv group is not response for any
contents of this guide. For any questions about this guide, please feel free
to contact me directly:

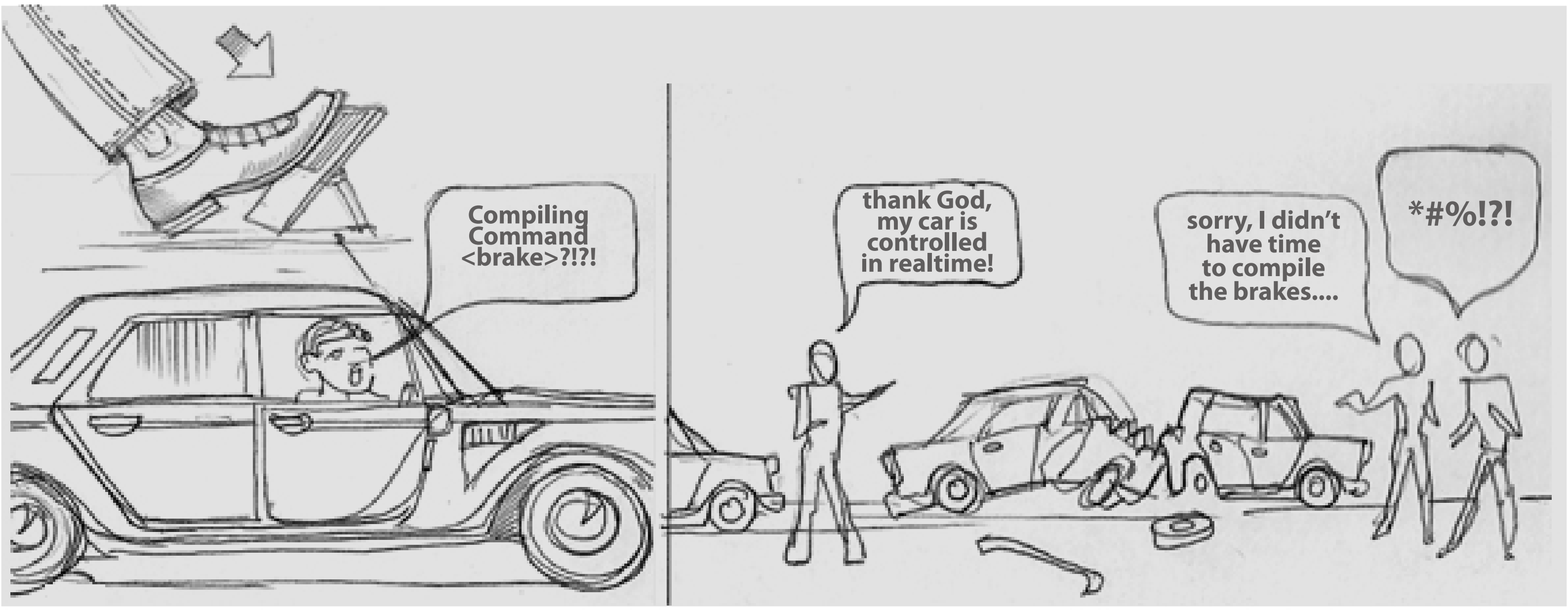
skype: andrey.bo.27

Credits and many thanks to:

Proofreading: Elliot Woods http://www.kimchiandchips.com
René Westhof
Illustrations: Georg Michri
Design: Nata Suntsova
Thanks to: vdmokstati, ain, alg, Kalle, m4d, vvvv group
and to my family Nadya and Dominika

why should I use vvvv?

vvvv is real time



Where many other programming languages have distinct modes for developing and runtime, vvvv has only one mode - runtime. In other words, vvvv is constantly performing calculations and rendering graphics while you're editing the patch.

Patching in vvvv is like driving a car. Get results immediately when you want it.

multipurpose and fast

You do not need many programms running

vvvv is suitable for many tasks involving common computer media types like:
video,
audio,
3d animation,
the internet,
interactive multi-users interactions,
multiscreen setups...... to name only a few.

To deal with 3d models, audio analysis and network connections at the same time, you do not need many programms running, but only the one. And the most imortant thing, vvvv is still realtime even when you are working with all those things at the same time. vvvv is more like hockey, not golf.

vvvv is a powerful graphical environment with built-in C# and HLSL code editors and many input/output nodes for all types of external protocols such as TCP, UDP, DMX, MIDI, TUIO, OSC, RS232 and so on...
Thanks to the community, you can also interact with Wii, PSP, Kinect and many more devices.

vvv is as cool as Leonardo and as simple as Robin Hood

vvvv is free for evaluation and non-commercial use.
You can start using vvvv right now without any restrictions.

http://vvvv.org/downloads

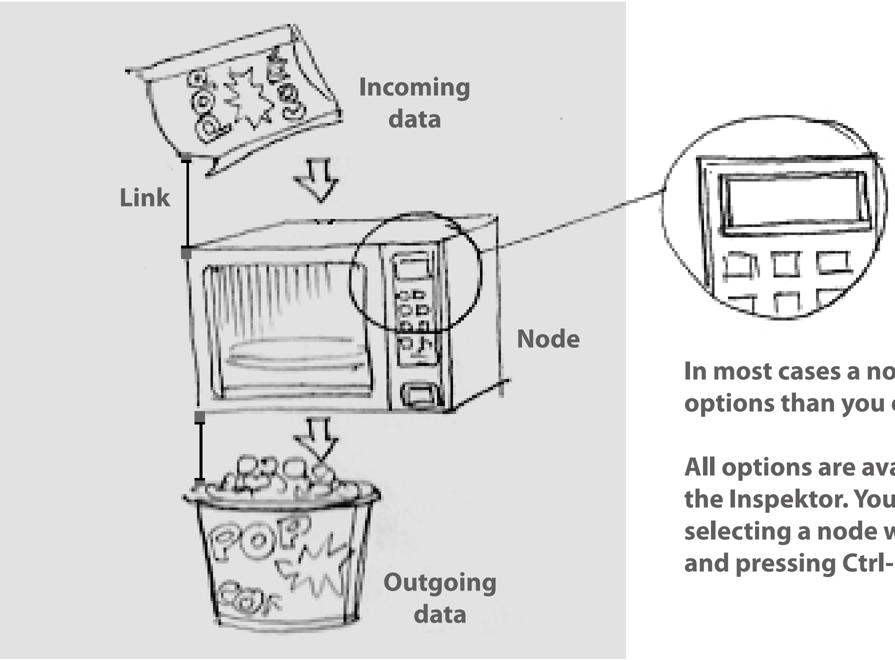
For all commercial applications, you need to buy a license.

http://vvvv.org/licensing

call yourself
a ‘media
artist’

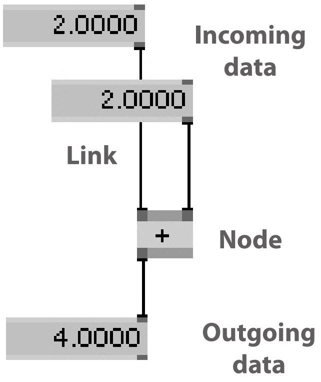
vvvv basics

vvvv uses graphical objects for programming instead of a textual programming interface.
Programs are created within *patches*. Individual operations and functions are represented as *nodes*.
Connections between nodes are called *links*, and are drawn and modified with the mouse.
Links create a structure that sends data from one node to another.

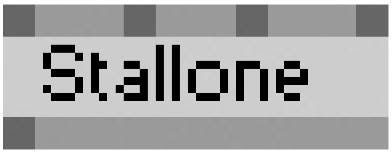


In most cases a node has more options than you can see.

All options are availiable in the Inspektor. You can open it by selecting a node with a left click, and pressing Ctrl-i



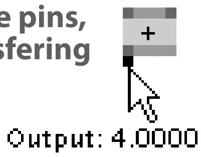
Input Pin(s) store settled data or receive incoming data via a link



Node calculates some magic

Output Pin(s) sends outgoing data via link(s)

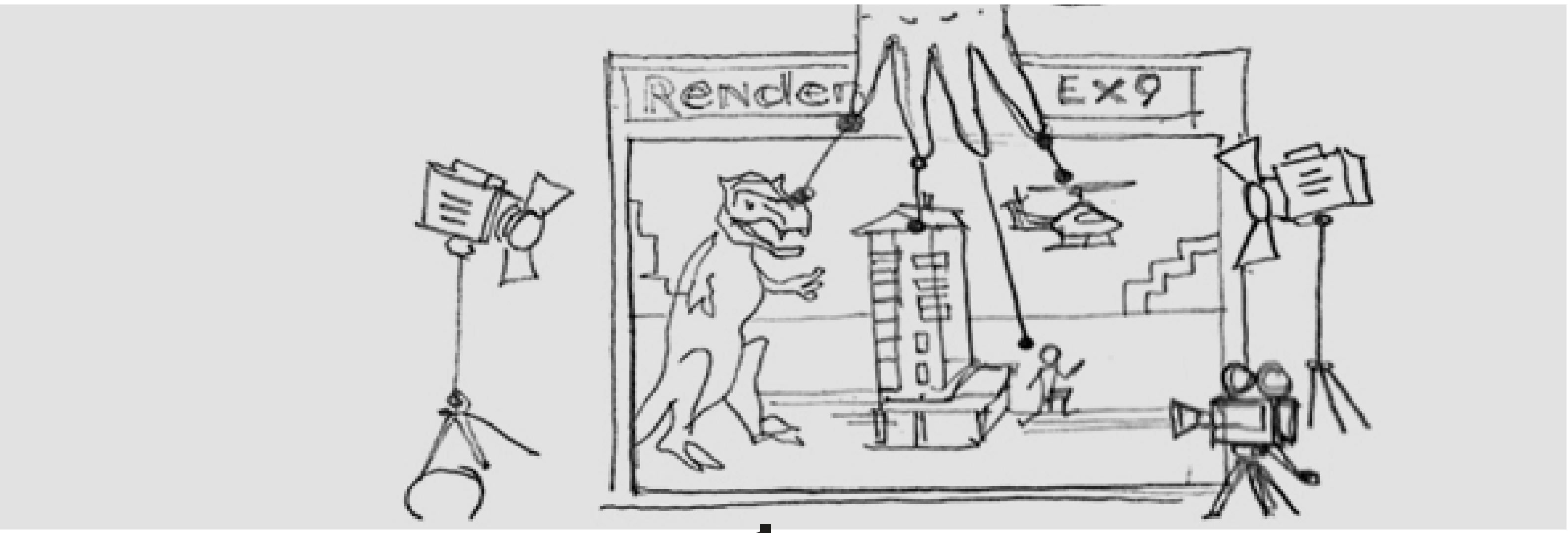
vvvv stores most datas in node pins, so links are necessary for transfering data only



To create your very first patch, run vvvv, double-left click into the empty grey window and select any node from the list.
Welcome to vvvv.

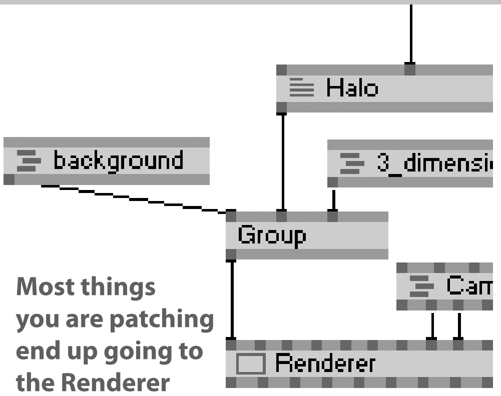
http://vvvv.org/documentation/tutorial-introduction

Renderer (EX9)

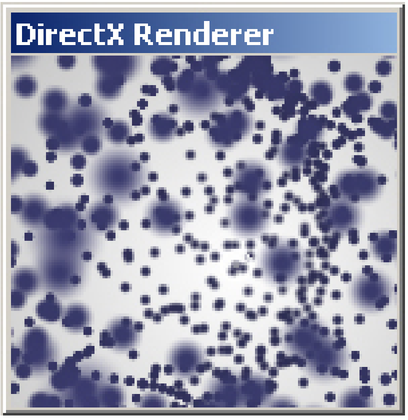


To view any output we need a renderer node. There are several different renderer nodes in vvvv (with possibilities to visualize different kinds of data). We generally use the Renderer.EX9 node for most types of visual data. The Renderer node has an external window named DirectXRenderer and, of course, it may be FullScreen with any resolution that your graphic card supports.

http://vvvv.org/documentation/dx9-rendering#starting-with-directx



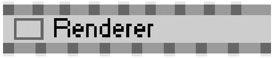
Most things you are patching end up going to the Renderer



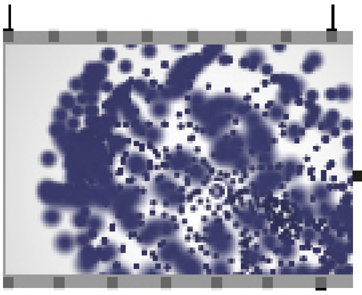
The Renderer node has an external window named "DirectX Renderer"

Click on the window and press Alt-Enter to force FullScreen mode. Before do so, you can check resolution settings in the Inspektor. Please refer to the Renderer's Inspektor screenshot on page 40

You can either hide the window into a node by pressing Alt-3



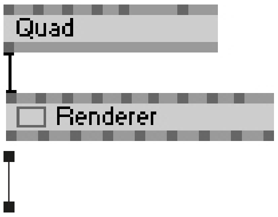
or show the renderer window as a block in your patch by pressing Alt-2.



/girlpower/(Halo Ball) patches by roman

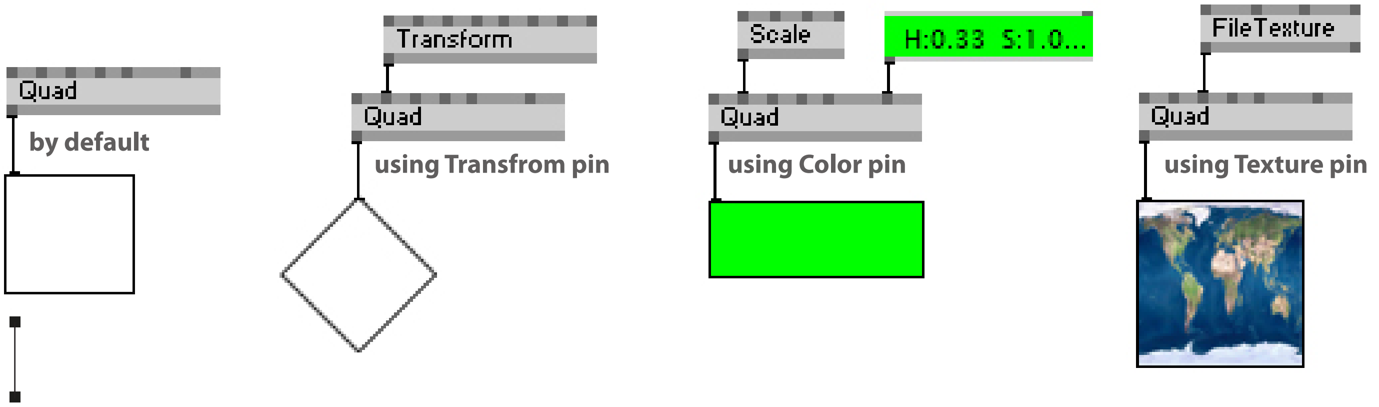
primitives (DX9)

The most simple thing that you can draw in the Renderer window is a Quad(DX9) node. But understanding Quad will open many doors in the world of computer media art for you. Don't let the EX9-DX9 naming disparity puzzle you - they communicate each other perfectly.
So let's connect Quad (DX9) to the Renderer(EX9)



It's ok even if it is not perfectly square
- you can read more about this when you learn about the coordinate system on page 24

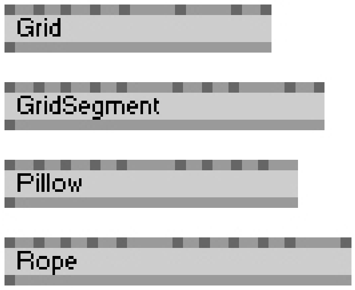
To introduce basic pins and save your printer ink, we draw results below as you should see them in the Renderer (EX9) window:



Other DX9 nodes work in the same manner.
Since pin names speaks for themselves, we do not explain them carefully now.

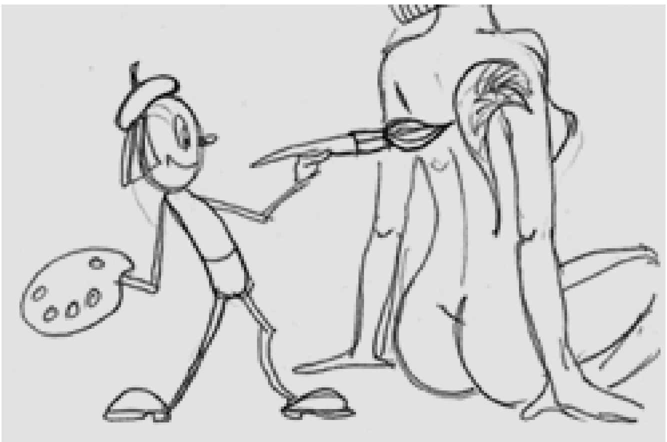
http://vvvv.org/documentation/quad-%28dx9%29

Feel free to play with following nodes:

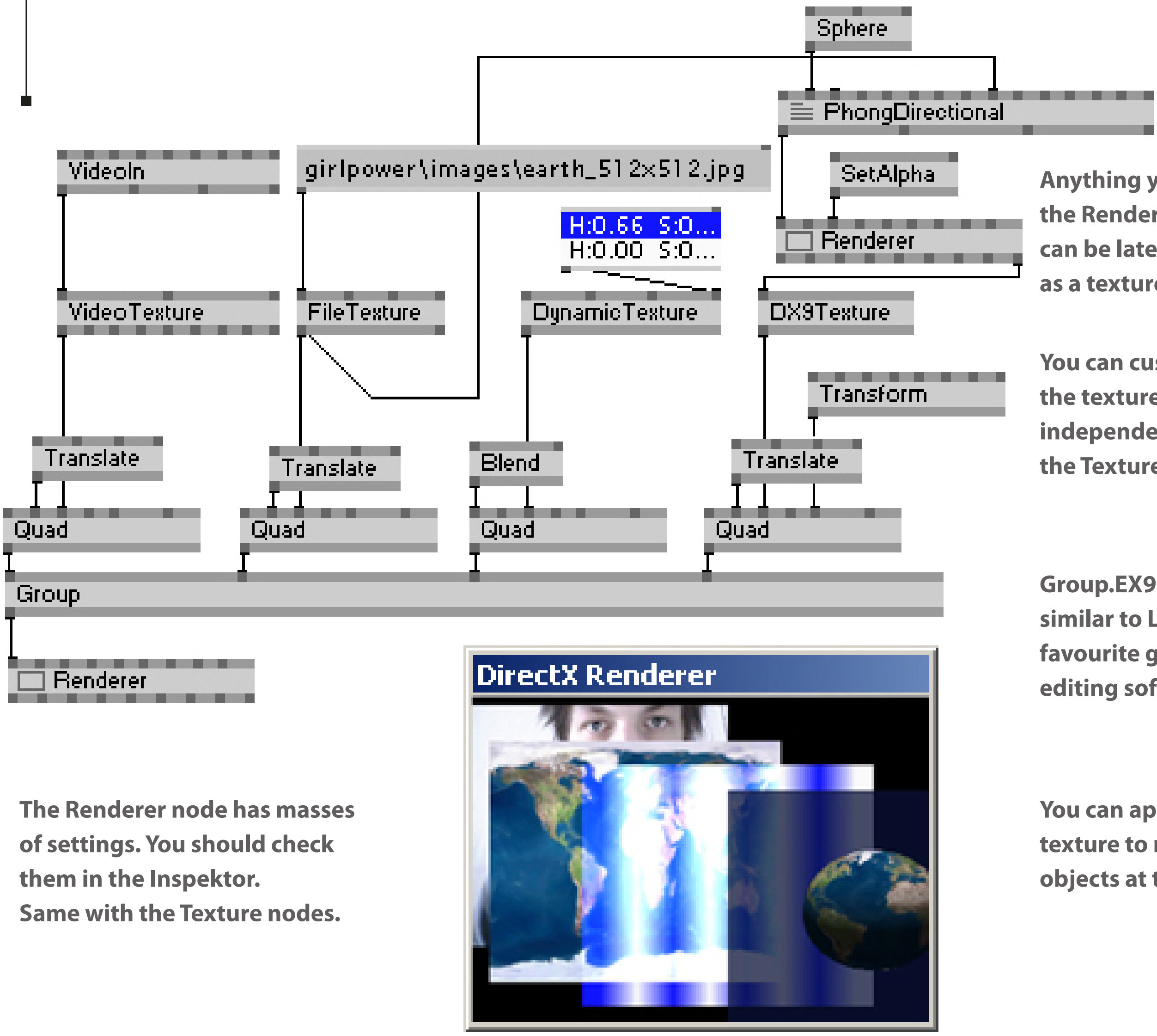


textures

vvvv supports many more textures formats than most people can imagine would exist.
For us, it is a pleasure to know, that by using only Renderer, Quad, Transfrom and Textures, we can call ourselves *contemporary media artists.*



http://vvvv.org/documentation/dx9-rendering#texturing



Anything you see in the Renderer window can be later used as a texture

You can customize the texture transform independently with the Texture Transfrom pins

Group.EX9 node is very similar to Layers in your favourite graphical editing software

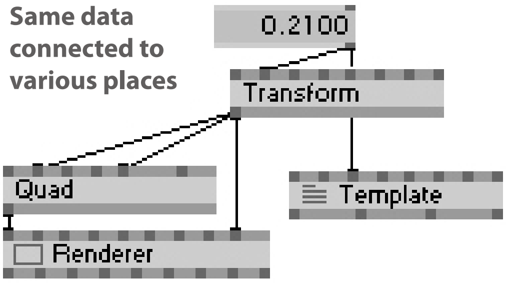
The Renderer node has masses of settings. You should check them in the Inspektor. Same with the Texture nodes.

You can apply the same texture to many different objects at the same time

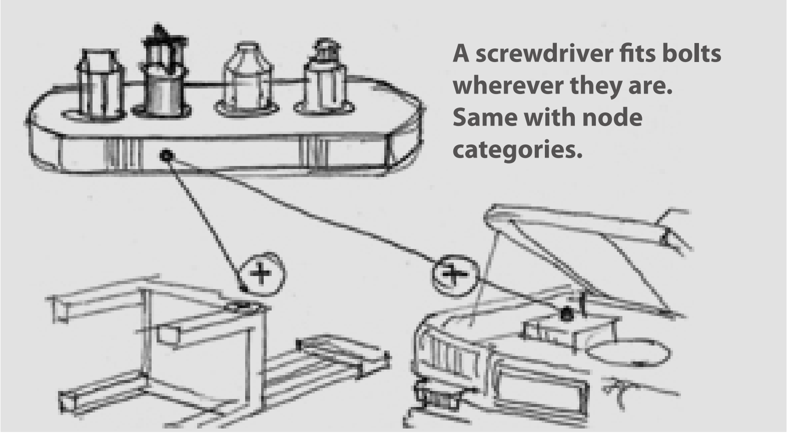
http://vvvv.org/documentation/howto-prepare-textures

nodes categories

vvvv supports many types of data, e.g. values, strings, textures, transforms, meshes etc...
Nodes dealing with same data type are grouped into categories and subcategories.

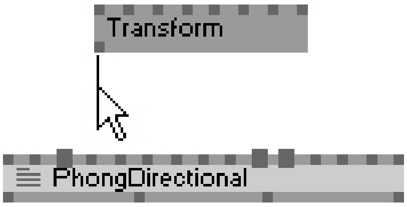


Same data connected to various places

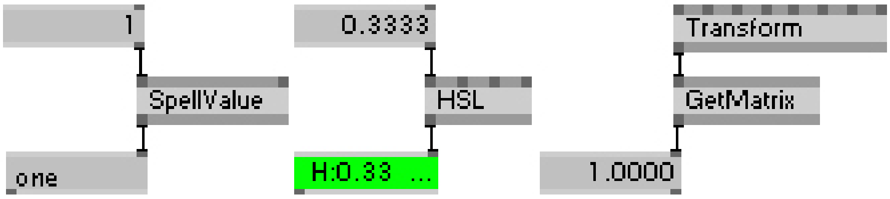


A screwdriver fits bolts wherever they are. Same with node categories.

http://vvvv.org/documentation/pins-and-data-types



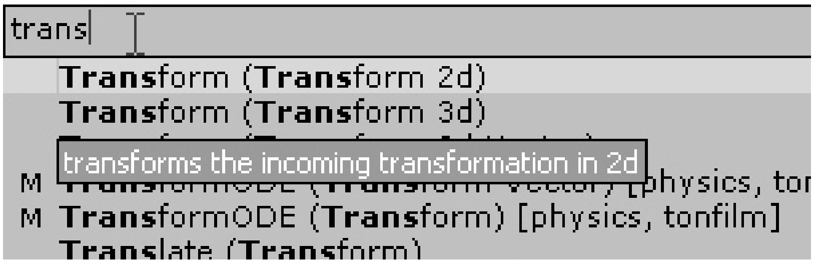
On starting every new link, vvvv highlights for you pins that can accept that link's data type



There are many nodes to convert one data type to another. With them you can achive very interesting and complex interactions.

http://vvvv.org/documentation/nodelist

The NodeBrowser is the central access point to all nodes that exist within vvvv.
Simply doubleclick inside an empty area of a patch to bring up the NodeBrowser.
Rightclick into the text field of the NodeBrowser to switch to a categorized tree view of the node list.



```
trans
  Transform (Transform 2d)
  Transform (Transform 3d)
  transforms the incoming transformation in 2d
M                                [physics, tor
M TransformODE (Transform) [physics, tonfilm]
  Translate (Transform)
```

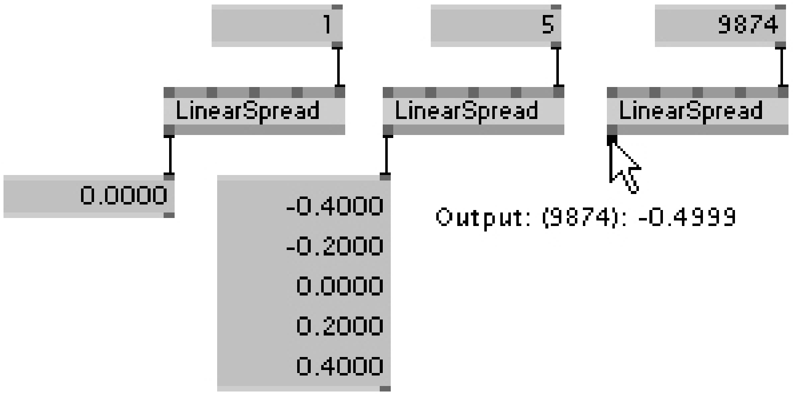
NodeBrowser with node list sorted by text input

Pressing Ctrl-N opens the NodeBrowser in an external window. From it you can drag-n-drop nodes into patches.

enough
to make
complex
things

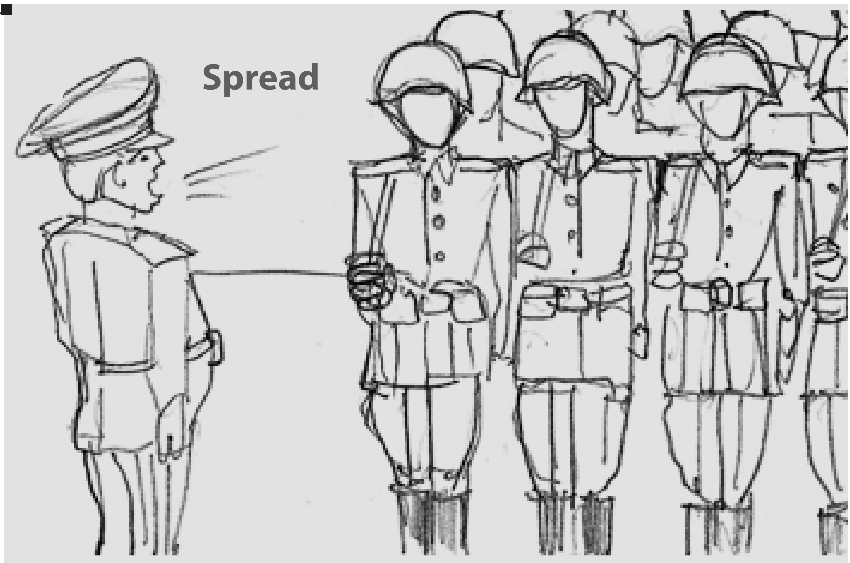
the power of vvvv is in spreads

The word *Spread* actually denotes nothing more than a list. A list of arbitrary data. Be it values, strings, colors,... and a signle entry in such a list we call a *Slice*.

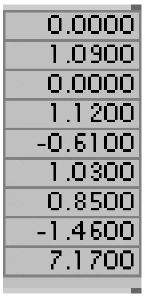


```
1            5            9874
LinearSpread LinearSpread LinearSpread
0.0000       -0.4000      Output: (9874): -0.4999
             -0.2000
             0.0000
             0.2000
             0.4000
```

In almost all cases where you want to deal with multiple instances of data, be it values, colors, files, textures, geometries... you can keep your patch pretty simple by thinking in spreads.

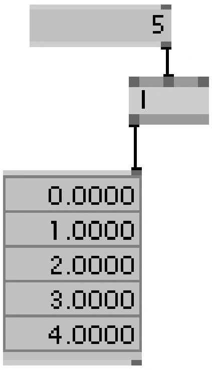


Custom spread



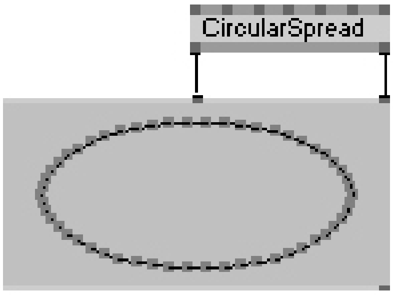
```
0.0000
1.0900
0.0000
1.1200
-0.6100
1.0300
0.8500
-1.4600
7.1700
```

I (Node) creates spread by range from # to #

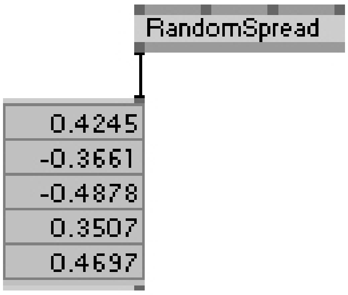


```
5
I
0.0000
1.0000
2.0000
3.0000
4.0000
```

CircularSpread outputs circlular values instead of you having to undertand sin/cos



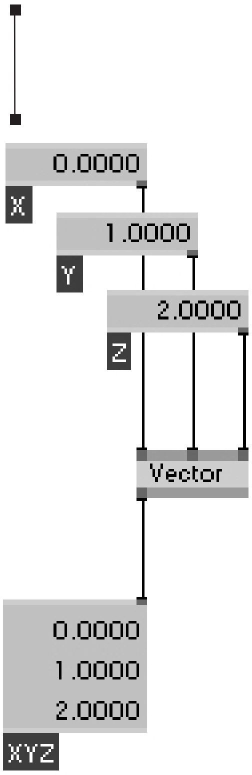
Set of random values



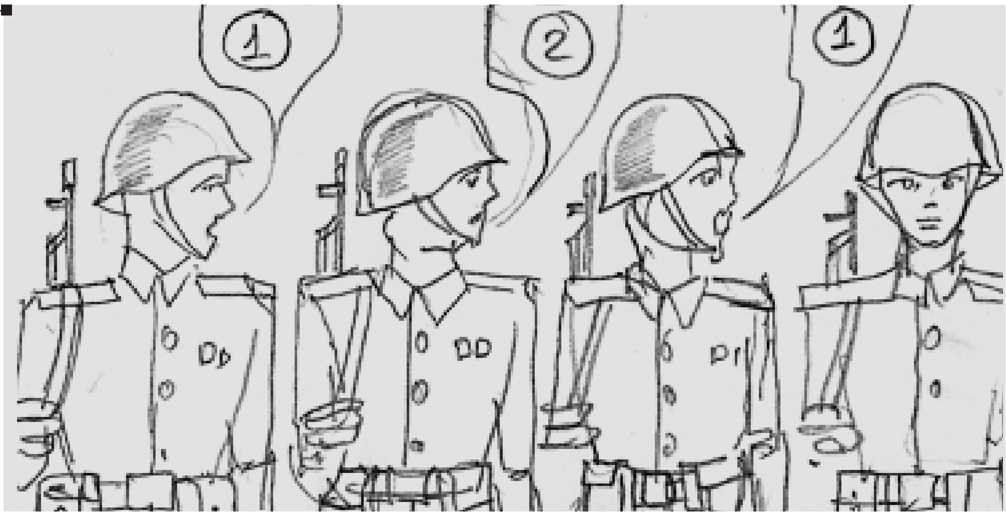
```
RandomSpread
0.4245
-0.3661
-0.4878
0.3507
0.4697
```

vectors

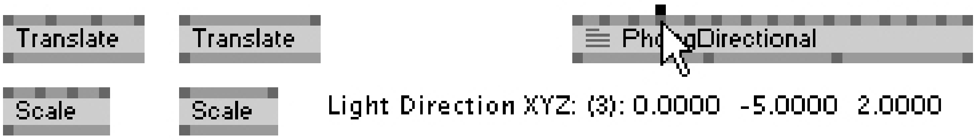
Vectors are not only maths tool but they are the most frequently used spreads.



0.0000
X
1.0000
Y
2.0000
Z
Vector
0.0000
1.0000
2.0000
XYZ

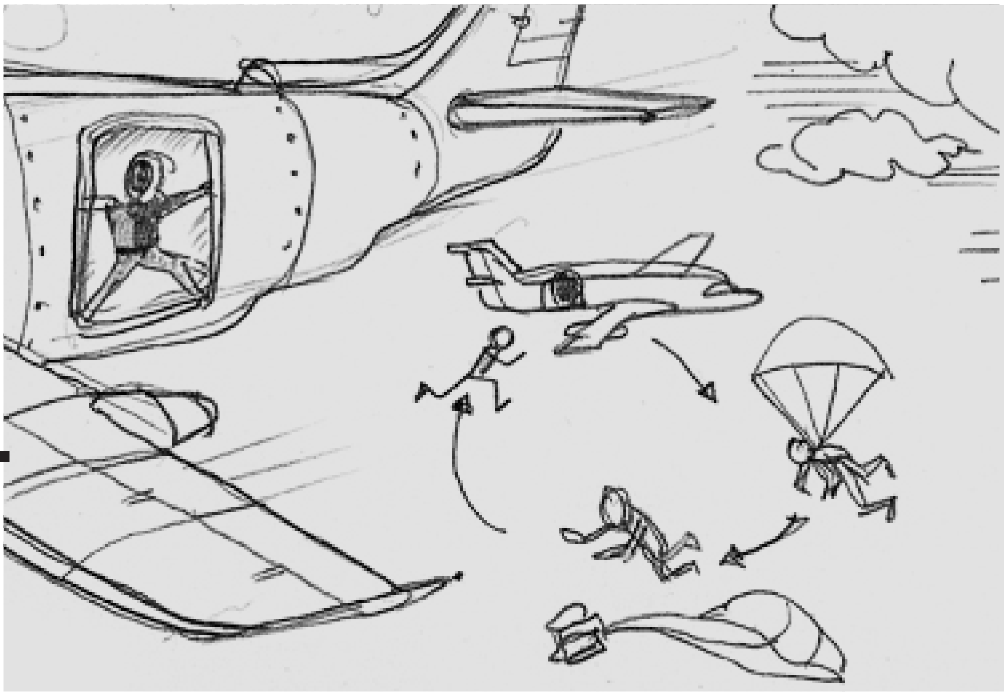


Thinking in vectors is very similar to thinking in spreads. vvvv has many vector oriented nodes, like Translate (Transform Vector) etc.



Light Direction XYZ: (3): 0.0000 -5.0000 2.0000

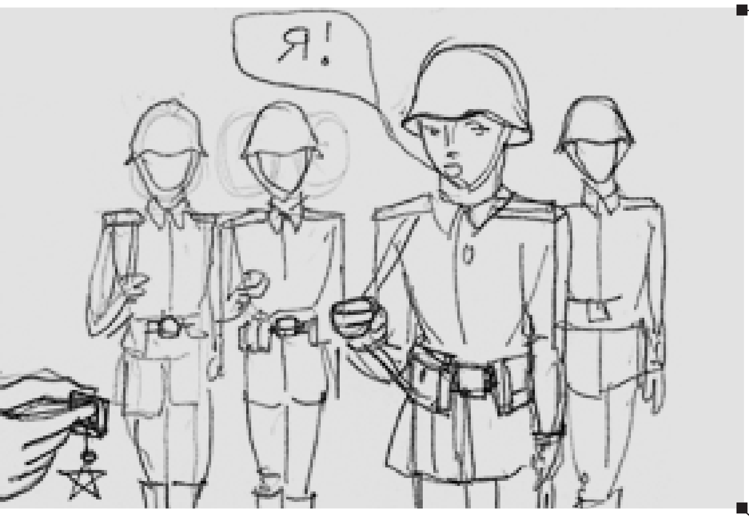
In many cases, using vectors is easier than using separated values.



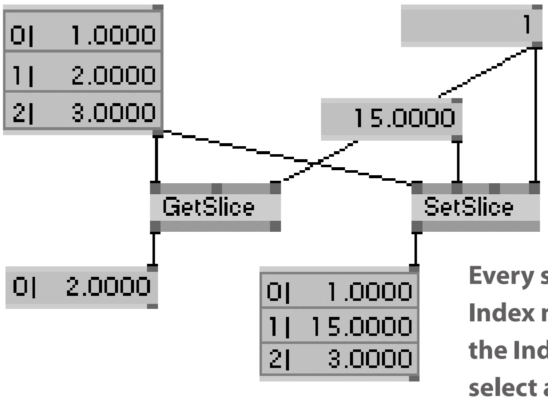
A node looks first at the slicecounts of all spreads it receives. The maximum slicecount of the inputs is used as that node's output slicecount. Well. Nevermind.

A spread will never end. When a node gets to the last slice, it goes back to the first one and simply repeats again.

controling spreads



Of course, there are a lot of good reasons to access individual slices.

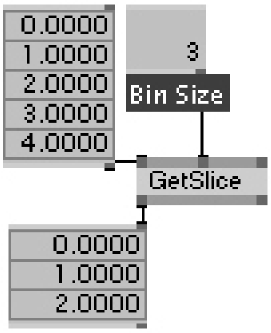


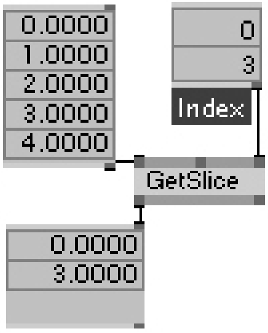
Every slice has an Index number. Using the Index, you can select any custom slice.

http://vvvv.org/documentation/spreads

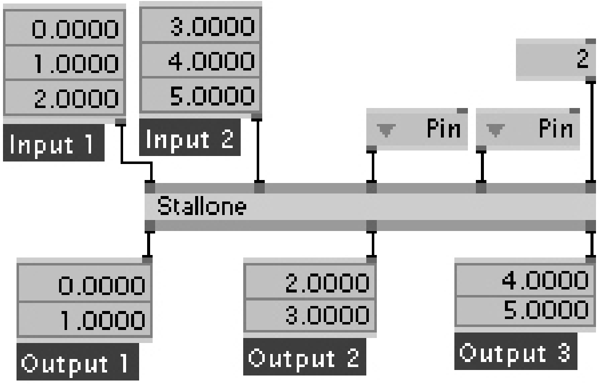
You can select not only one slice, but spread of slices. Either you may sort and shift them by using special nodes from the Spread category, applying custom spreads to Index pins or useing BinSize pins.

The BinSize determines how many slices the node will take from the spread

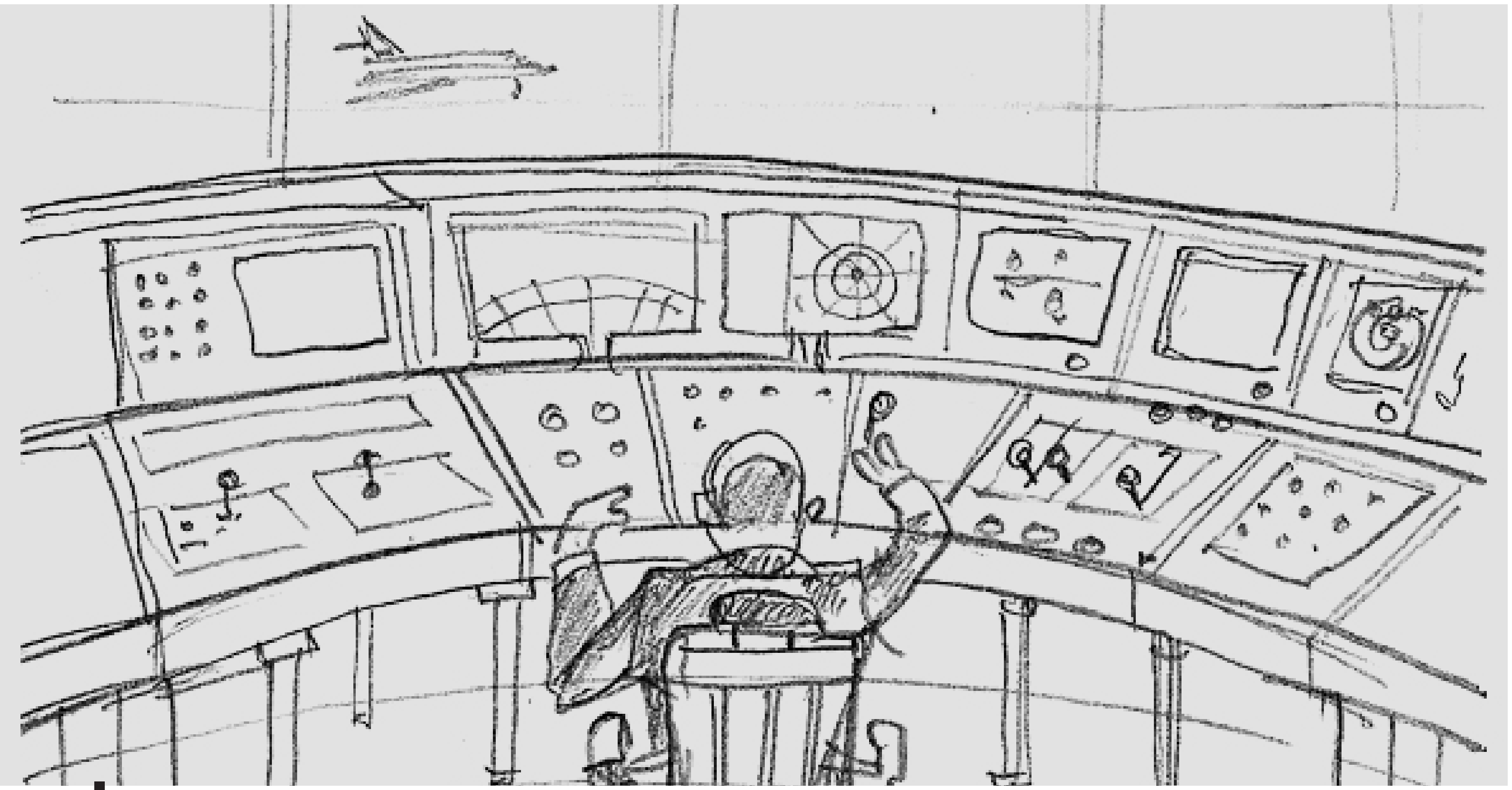




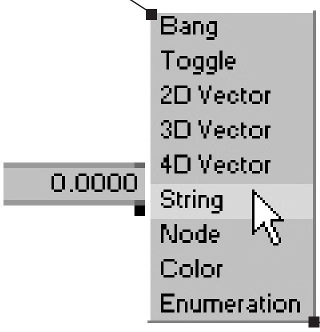
Stallone is a very flexible node, which allows you to merge slices from any number of inputs and distribute them to any number of slices on any number of outputs.



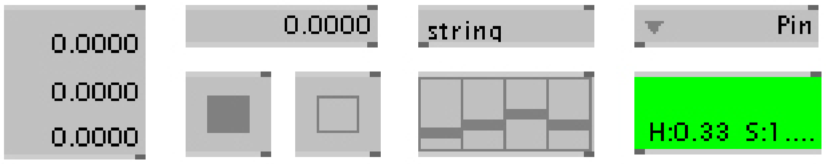
io boxes



IOBox means Input/Output Box, meaning that these nodes are useful for both purposes:
As a means for the user to input data into the running program. On the other hand they can be used to output/display data from the running program.
We have used many IOBoxes for the screenshots of this guide, to make important data visible.
However, these IOBoxes are generally not vital for the functioning of the patches in the examples.



Use **Double right click** in an empty space within the patch window to get to the IOBox shortcut menu



**If you are looking for interface elements like sliders and buttons, then IOBoxes are also all what you want.
Please take a look at the IOBox Inspektor screenshot on page 39.**

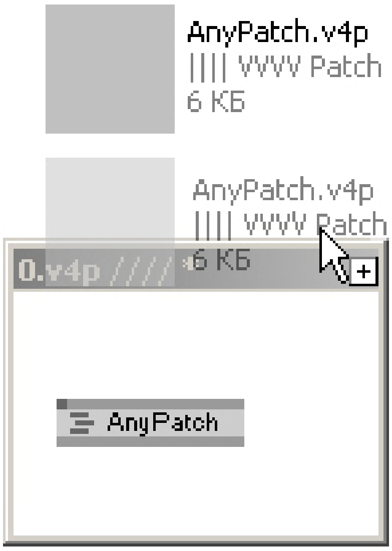
http://vvvv.org/documentation/tutorial-ioboxes

subpatches

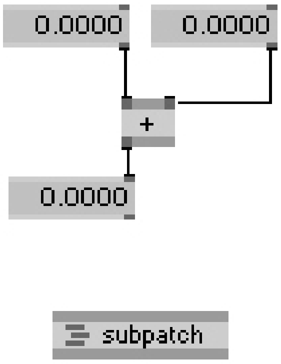
A Subpatch is nothing special at all: it is just a node containg a patch.
The term *Subpatch* describes only the way you view the patch:
it is a standard patch which has been placed inside another one.

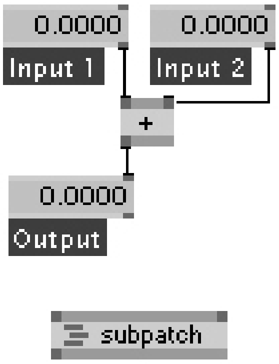
Creating a Subpatch is extremely easy.
Pins can be added to the subpatch node by entering a Descriptive Name to IOBoxes within the subpatch. You can give these names in the Inspektor or by making a middle-mouse-click on a connected IOBox.
In this case, the IOBox acts as a parameter, and appears as a pin on the subpatch node.

Now, just save your patch that you want to become a subpatch, close it, and then drag-and-drop the .v4p file from Windows into another patch.

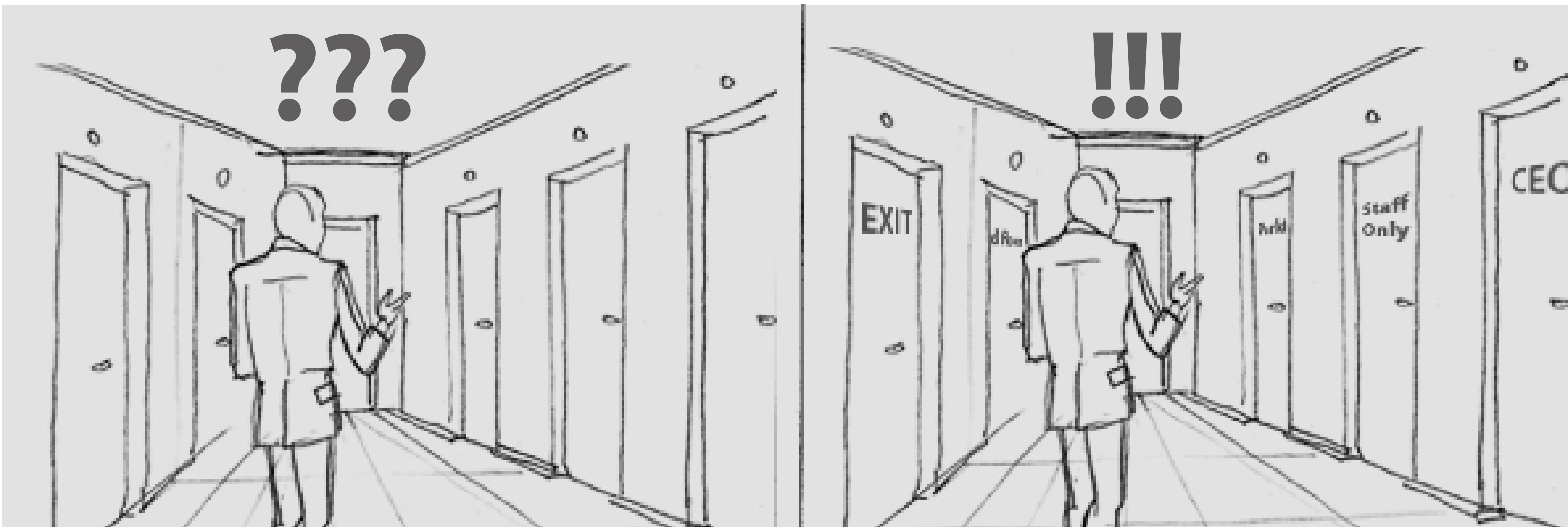


http://vvvv.org/documentation/subpatches

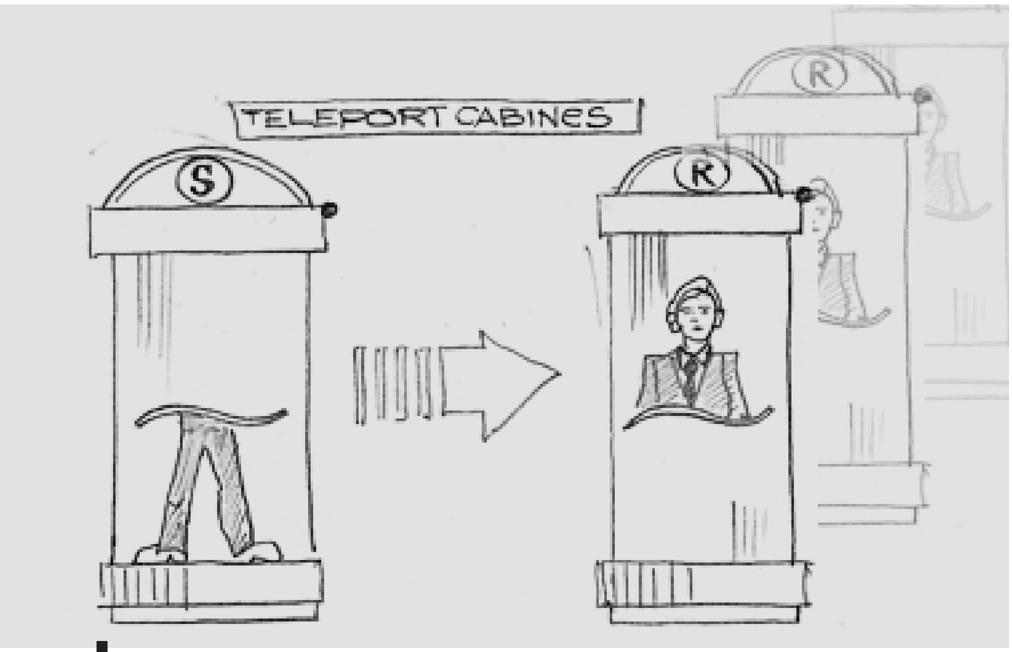




Right clicking on the subpatch node opens it in an external window (or hide it again if it is already opened).
Alt-1 Alt-2 Alt-3 shortcuts also work. Ctrl-W - close subpatch window and REMOVE subpatch from the patch.

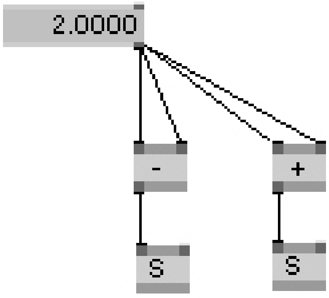


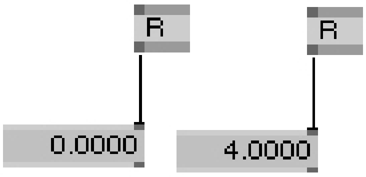
S and R nodes



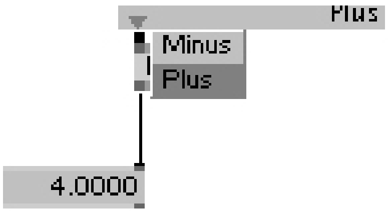
Futuristic machine, to immediately transfer from one place to many other places is availiable now in vvvv

Sometimes you need to transfer data, but you don't want to create new links. S and R nodes are for that.





R nodes can be placed anywhere in currently open patches.



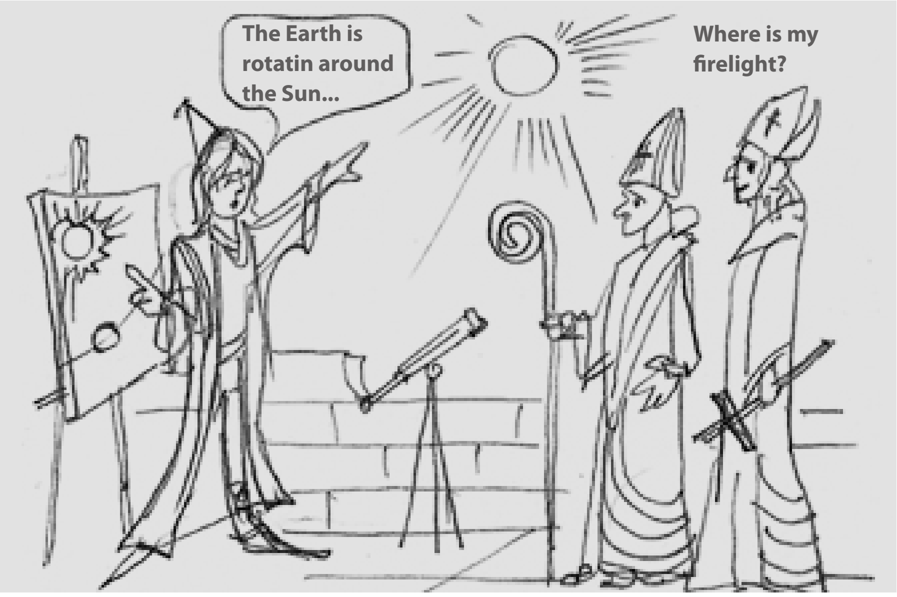
A pull-down menu for R nodes is automatically generated from the all descriptions of SendString pins of all S nodes

You may want to use them to keep your patches clean when one piece of data goes to many-many places, or the 'deepness' of your subputching means that making links is not comfortable at all.
Of course, there are also other reasons to use S/R Nodes.

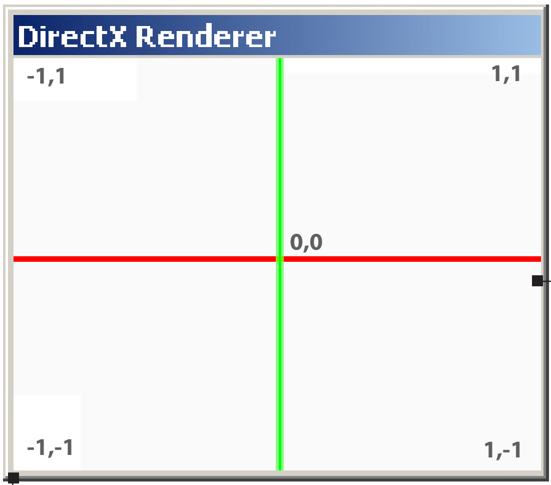
enough
to make
beautiful things
in 3d space

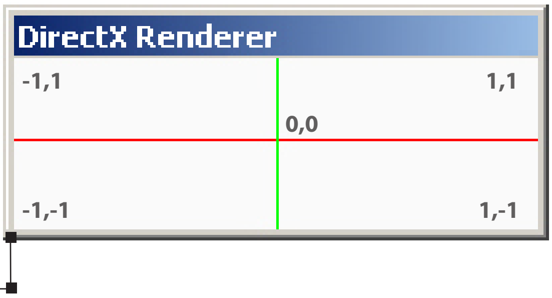
coordinate system

The Renderer window area has a default range of -1 to +1 in both dimensions (XY). The origin has coordinates 0,0 and is in the middle of the window. There is also a z-coordinate, which is not shown in the diagram.



There are naturally no pixels, inches or millimetres in the coordinate system of vvvv, but only four digits values (0.0000). Actually this works well, because coordinates do not depend on the window size or screen resolution. We call this normalised coordinates.





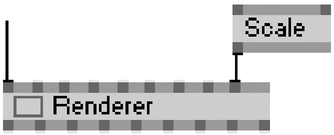
The Renderer window area has a default range of -1 to +1

So, if you want a Quad to fill the whole Renderer you need to scale it by 2

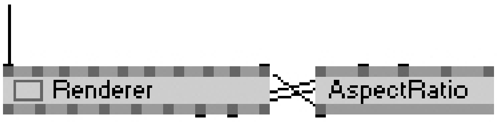
http://vvvv.org/documentation/dx9-rendering#coordinate-systems

Of course, you may want a square to always look like a square, or have a different range of coordinate in some cases. You can do so by applying Transfrom nodes to transfrom pins of the Renderer node.

Scale by 0.1 maps the Renderer coordinates range to -10 to +10

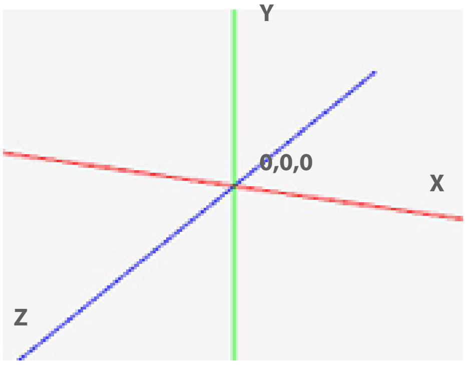


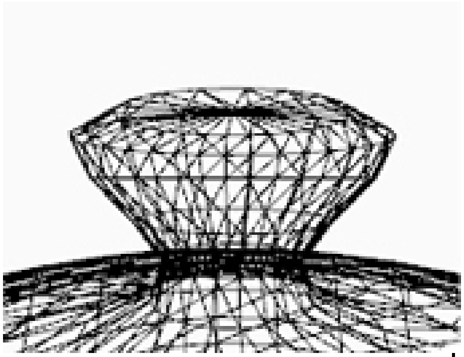
The AspectRatio node helps by making coordinates depend on your window size, you may also force aspect ratio e.g. 4:3 or 16:9 aspects

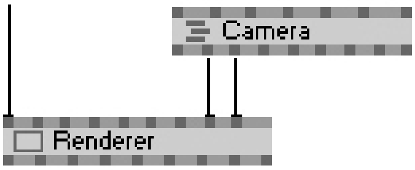


3d space

The coordinate system in 3d space will be generally be transformed by our view onto the 3D scene, this will create some distortion of the coordinates. The easiest way to look around a 3d space is to connect the Camera (TransfromSoftimage) module to the View and Projection pins of a Renderer.EX9 node. Keep in mind that the world you see in 3d space always depends on your point of view.







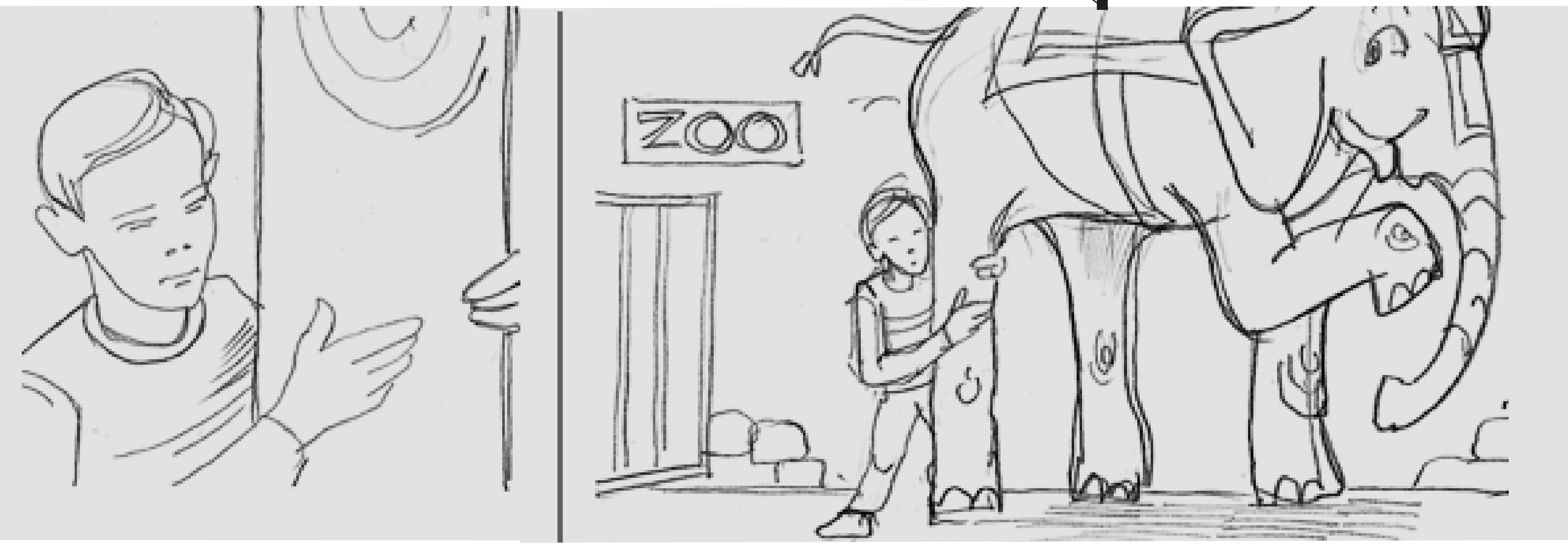
Easy to use virtual camera for day to day work with the Renderer (EX9).
Keyboard & Mouse Usage:

Orbit press O and hold while dragging to Orbit
Zoom press Z and hold while dragging to..
[left mousebutton:] pan
[right mousebutton:] zoom
Position press P and hold while dragging to dolly
[left mousebutton:] slow
[right mousebutton:] fast
Reset press R and hold for a moment to reset the viewport

View pin is for camera position or rotation
Projection pin is for perspective

Since these pins accept transform data, you can apply any custom transfrorm here.

http://vvvv.org/documentation/ex9.spaces



The world you see, always depends on point of view.

3d models in vvvv

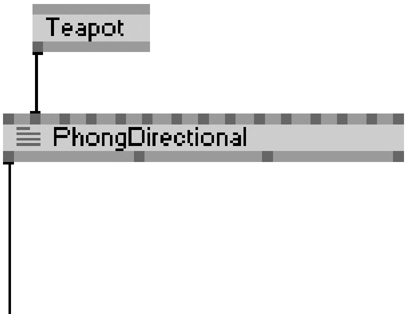
In vvvv there are several ways to create a 3d model, aka Mesh:

use a basic primitives like Grid, Box, Sphere from the EX9.Geometry node category;

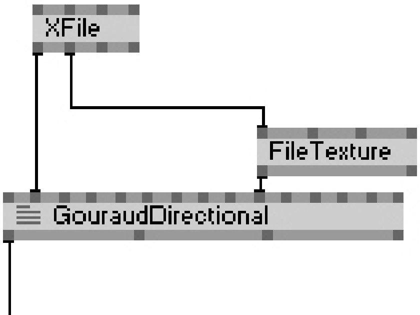
load an .x file from a 3d modelling application using XFile (EX9.Geometry Load);

load a .dae collada file from a 3d modelling / animation application using the COLLADA plugin;

create generative geometry with VertexBuffer (EX9.Geometry Join) and Mesh (EX9.GeometryJoin).

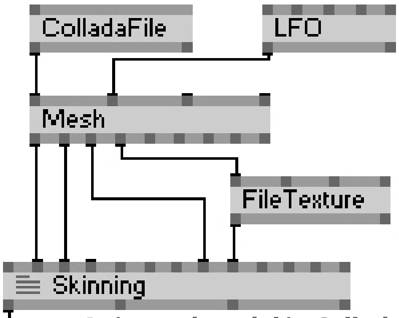


EX9.Geometry primitive



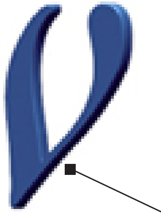
Model in xFile format

.x file



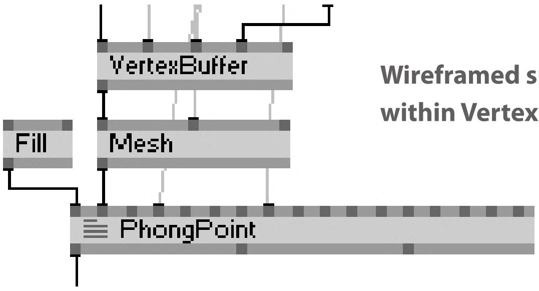
Animated model in Collada format

.dae file

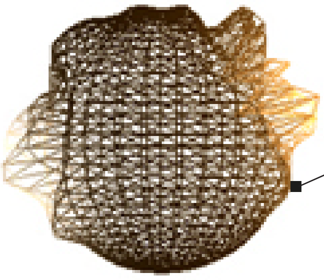


http://vvvv.org/documentation/ex9.geometry

Each vertex is a container for data like position, orientation (normal), texture coordinates and so on. Since vvvv gives direct access to the vertex data, there are no limits to how you can deform 3d models.



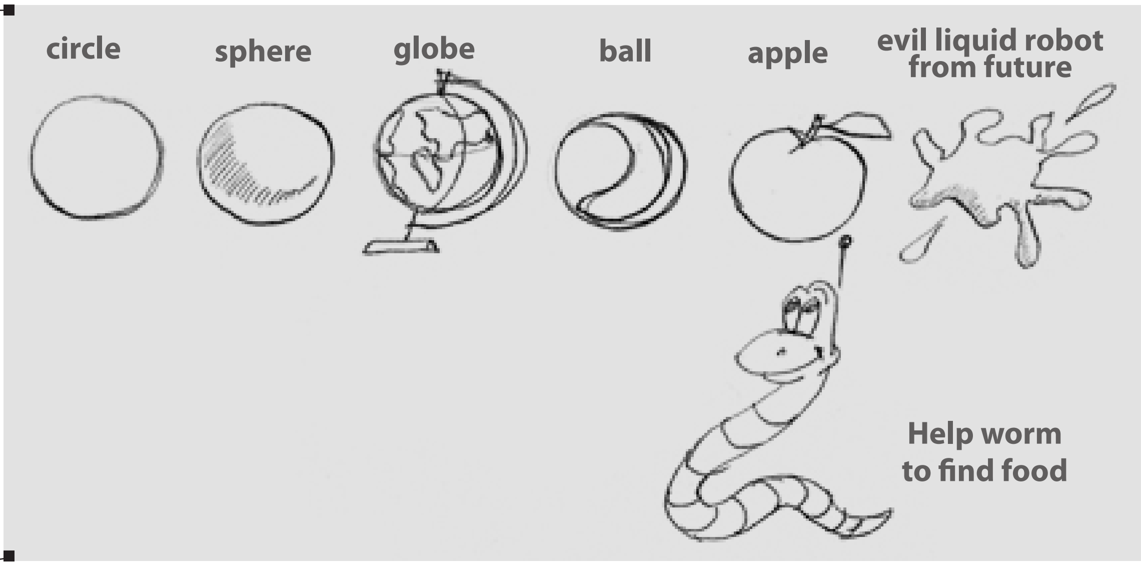
Wireframed sphere, deformed within VertexBuffer nodes



/girlpower/fluidynamicshere.v4p patch by defetto&thedoctor

vvvv effects aka shaders

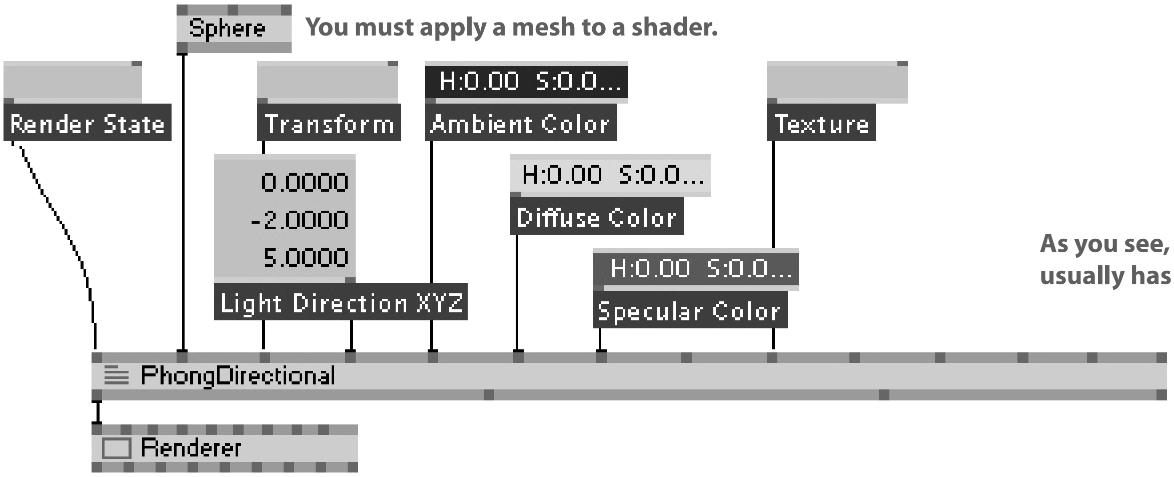
Actually, all we give our worm to eat is the same sphere, but our shader determines how that sphere will appear.



Shaders are nothing but good news.

Firstly, without knowing anything about them, you can use them as usual nodes. Simply look in the EX9.Effects category in the NodeBrowser. The single thing you must always remember is that you must apply a mesh to the shader, to give it an object to visualise.

http://vvvv.org/documentation/tutorial-of-effects-and-shaders



You must apply a mesh to a shader.

As you see, a shader usually has lots of option

Second, since vvvv has a built-in HLSL textual editor, you may edit and create original effects yourself. Simply right-click on an effect node to open the CodeEditor window, or start your own shader by cloning a template. Select Template (EX9.Effect) from NodeBrowser and press Ctrl-Enter to start editing a new shader.

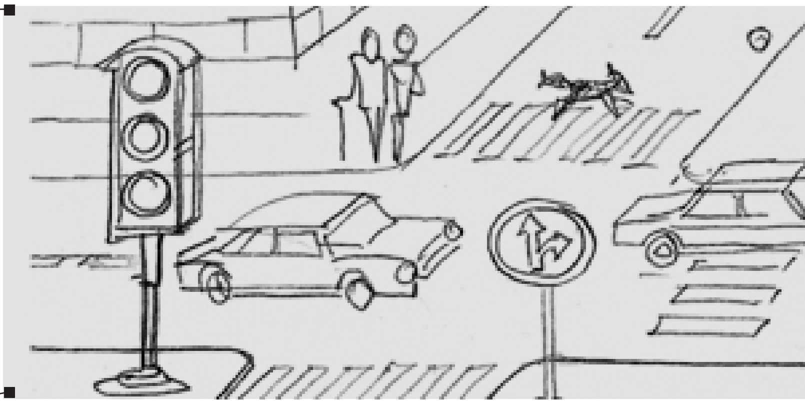
And third, there are plenty of lovely shaders developed and shared by the community:

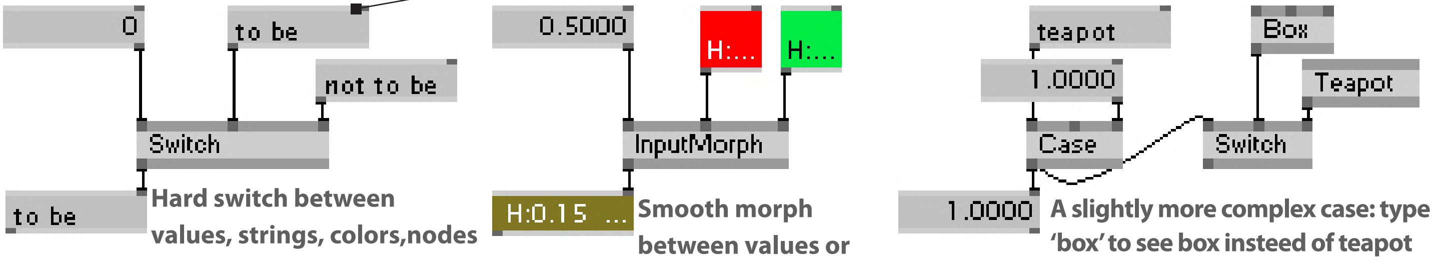
http://vvvv.org/contributions

becoming
much more
advanced,
you may want
to spend
20 minutes

logic

You must stop on red light, and you can go on green. vvvv has switch nodes which can do this in your patches. You can also create complex algorithms with the boolean category nodes.





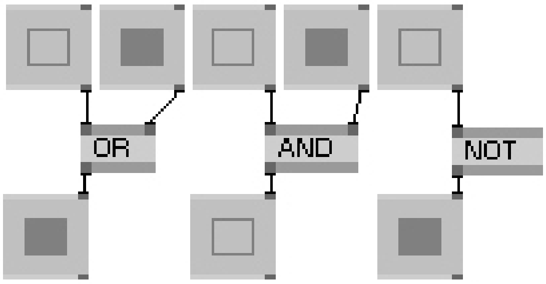
Hard switch between values, strings, colors,nodes

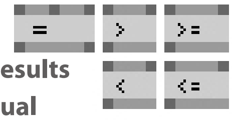
Smooth morph between values or colors

A slightly more complex case: type 'box' to see box insteed of teapot

http://vvvv.org/documentation/logic

Classic *if, else, then* logic can be easly recreated with boolean nodes like OR, AND, NOT.





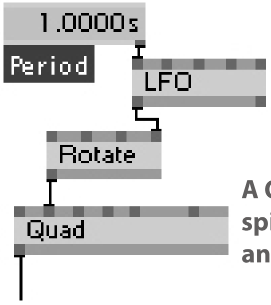
You can also achieve the same results with simple value nodes like Equal

When programming sequences, interaction logic or any other more complex tasks, you should try NOT to interweave the logic parts of your patch deep into the graphical parts of your patch. It is generally best to have a 'central command' station where you handle all the locical states in an abstract way, and then send only the relevant data to other places in your patch.

timebased logic

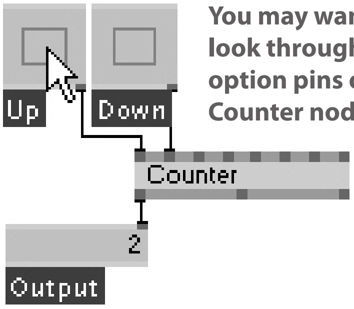
If processes in your patch are going to be concerned with time (like a count down from 10 to 0), or you need timebased loops (like an animated walk or cycled rotation), or you need bangs to be toggled for a while, then there are many nodes for that. Most of them are from the Animation category.

LFO (Animation) counts up from 0 to 1 over a set time period.



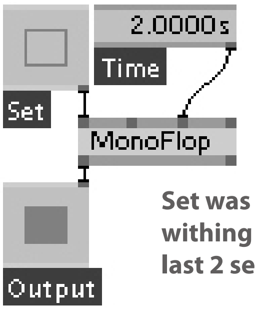
A Quad makes a full spin every 1 second and will do so forever

Counter (Animation) counts up or down on every bang.



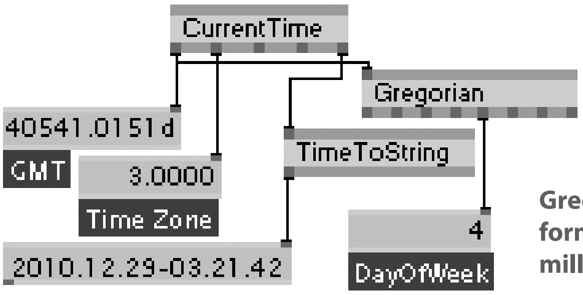
You may want to look through all the option pins on the Counter node

MonoFlop (Animation) keeps a bang for a set amount of time.



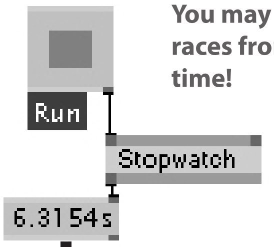
Set was hit withing the last 2 seconds

CurrentTime (Astronomy) knows what day it is now.



Gregorian (Astromony) formats the time from milliseconds to years

Stopwatch (Animation) knows how long its been running.



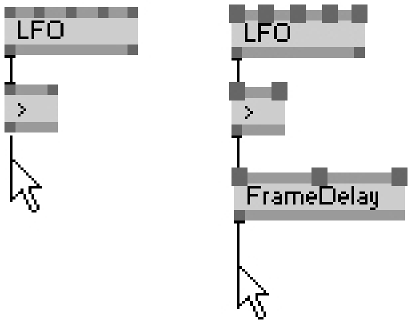
You may need to time races from time to time!

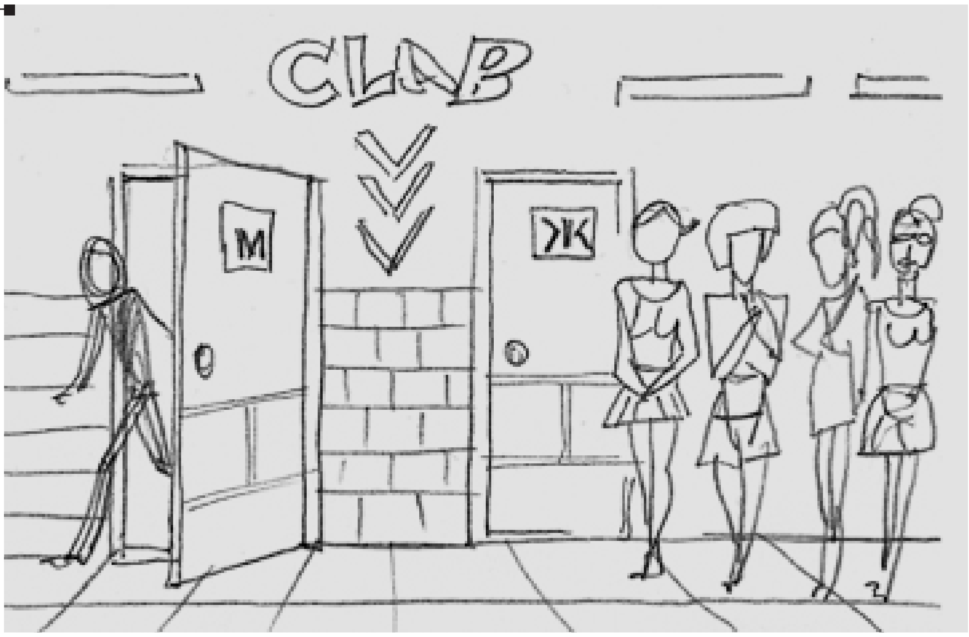
http://vvvv.org/documentation/timelinersa

TimelinerSA
is a very advanced
timeline.

loops and feedback

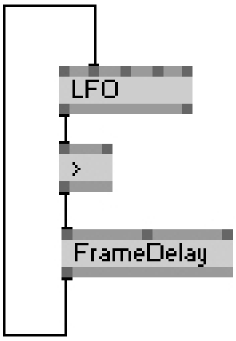
The basic rule to remember is: *vvvv will only evaluate all nodes in the graph only once every frame*, so if you want to loop any data, you'll have to wait a bit.





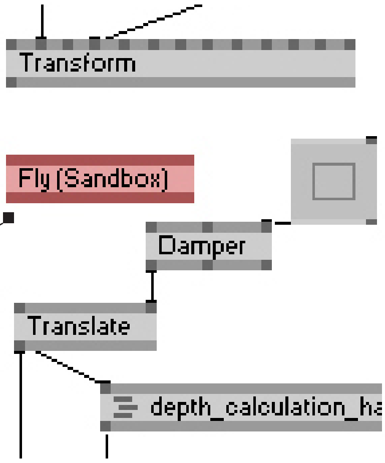
Single reason to wait a bit

Nodes like FrameDelay (Animation) give an output which doesn't depend on its input this frame, but instead of the input from the last frame - this is perfectly allowed. So as soon as you have at least one node like this in your loop, then you can 'close' the loop. Other nodes also have this property.



red nodes and other bugs

Sometime you can find red nodes without pins. This can happen (for instance) when you download contributions or features from the forum. With red nodes vvvv, tells you that it cannot find a specific file at a specific place. So all you need to do is find the missing file and specify right path to it.



http://vvvv.org/documentation/paths

vvvv has nodes which help you to find problems. The first is Renderer (TTY) - it will report problems that vvvv encounters to you, in an external text window. It's generally a good idea to place the Renderer (TTY) node somewhere inside your patch, especially whist you are coding.

The Timing (Debug) node and PerfMeter (Debug) module can report the framerate of your system. MainLoop (VVVV) allows you to limit the framerate that vvvv should run with.

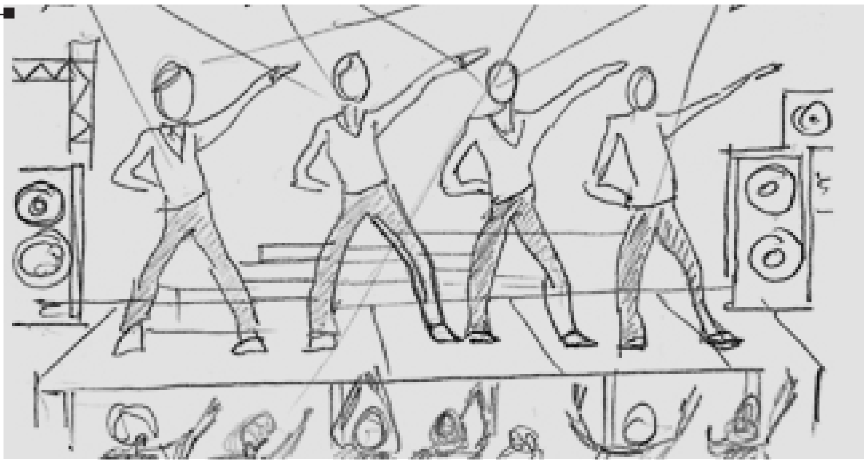
http://vvvv.org/documentation/troubleshooting

To fix other bugs, try to search through the forum threads. To highlight any new bug that you've found you can start your own thread in the forum. You may note that vvvv is still a beta release.

sorry girls, idea for the sketch comes from my girlfriend

boygroup

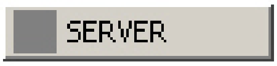
Boygrouping is the name for vvvvs built-in client-server architecture. It allows you to control any number of render computers (i.e. clients) from 1 or more servers. This way, you can do all of your patching on the server whilst your patch runs across the entire network. VVVV makes sure that all the connected clients will run 'N'Sync'. Applications of boygrouping are usually multi-screen systems and seamless multiprojection setups.



Connect two or more PCs to the network via Ethernet and manually specify their IPs.

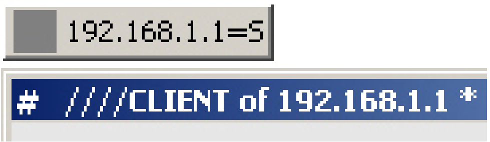
Run vvvv on the Server with commandline parameter /server

vvvv.exe /server

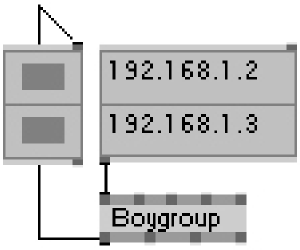


Run vvvv on the Clients with commandline parameter /client [SERVER IP]

vvvv.exe /client 192.168.1.1

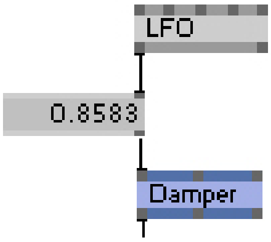


Specify clients IPs using the Boygroup (VVVV Server) node



Do nothing here

Press Ctrl-B to make selected nodes blue

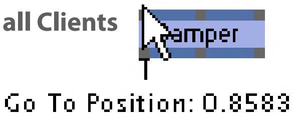


Grey nodes exist on the Server only

Blue nodes are duplicated onto all the Clients

Welcome to the boygroup and still do nothing here

Same nodes on all Clients



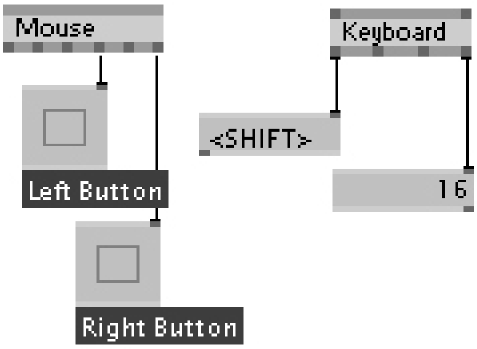
Any data in links between grey and blue nodes are sent over the network. VVVV handles all this for you. You can Boygroup Value, String and Colour types

http://vvvv.org/documentation/boygrouping-basics

external protocols

vvvv has input/output nodes for tonnes of external protocols, e.g. TCP, UDP, DMX, MIDI, TUIO, OSC, RS232 and so on... Thanks to the community, you can even control Wii, PSP, Kinect and many more devices.

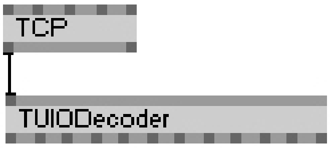
But lets start with the basics:



The Mouse (System) and Keyboard (System) nodes recieve data from the most used devices. In many cases, that's enough.

http://vvvv.org/documentation/io

New devices comes onto the market around the world every day. For some, you need drivers, for others you don’t. We will just point out some nodes below. I guess you have a time to play with your device.



Thanks to the TUIO protocol you can recieve data from many types of software and devices, e.g. from iPhone

Some MIDI keyboards are cheap and effective to use for life performances

DMX is worldwide standard to control lights (and sometimes sound) via a DMX network

Human Interface Devices are things like joysticks, wheels, gamepads, touch-screens etc.

RS232 is professional standard to control various types of devices, from dvd-players and plasma sreens to giant scrapyard claws and factory machines. You can also use this node to talk to your Arduino.

girlpower

Now all you need is girlpower!

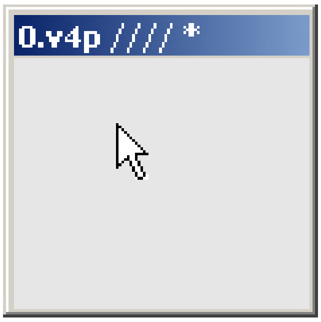
The /girlpower folder comes with every vvvv release and contains many demo-patches of the main vvvv features that were introduced over the past years.
Exploring and tinkering with the patches one by one inside the girlpower folder will teach you much than reading ever can.

/vvvv45_beta25/girlpower/

to print
pages 37-43
and keep
them near
you to you

vvvv user interface

opening vvvv for the first time



** Double left click on empty space inside the patch opens NodeBrowser

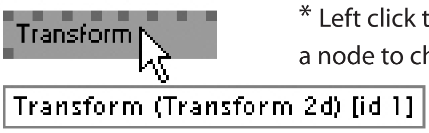
** Double right click on empty space inside the patch opens IOBoxes menu

* Middle click in the patch opens the Main Menu

~ Right click and drag to scrolls around inside the patch window

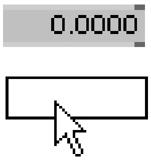
All the standard Windows shortcuts are the same in vvvv.
E.g. ctrl-c, ctrl-v, ctrl-s etc.

working with nodes

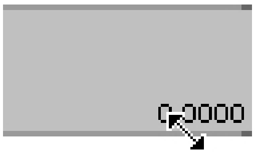


* Left click to select a node to change to

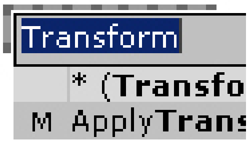
A tooltip appears when you hover your mouse over a node, this shows NodeName (Category Subcategory)



* Left click on a node and drag the mouse to move nodes



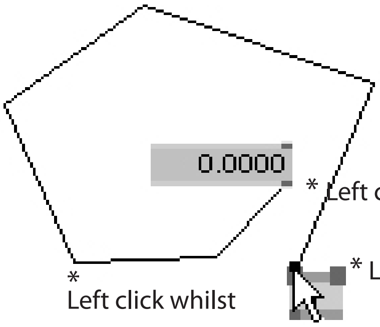
* Left click on the right hand side of a node and drag to to resize nodes



** Double left click on any node opens the NodeBrowser

You can even change connected nodes. All pins with the same name will keep their links.

working with links

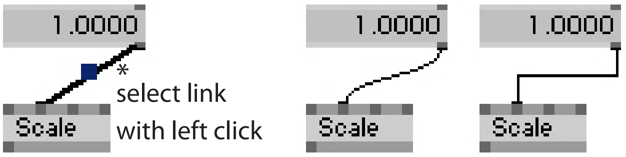


* Left click on a pin to start a new link

* Left click on a pin to end the link

* Left click whilst drawing a link to make an anchor

You can start new links either from output or input pins.
Whilst drawing a link, Right click to cancel the link.
Right click can also delete links, so be careful.



* select link with left click

Ctrl-Y with a selected link changes the link draw type

Changing link draw type is useful to keep your patches visually clean and readable.

http://vvvv.org/documentation/ui-reference

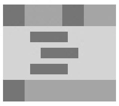
See online UI Reference or download official pdf guide

http://vvvv.org/sites/default/files/uploads/dontpanic_45beta25.pdf

vvvv user interface

nodes types

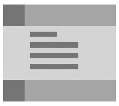
There are several types of nodes in vvvv. A small icon left of the node title shows you which type a particular node is.



Subpatches and Modules

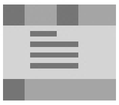
These nodes contains patches inside, you can open them and edit them like other patches

right-click on these nodes to either open the subpatch in an external window, or hide the external window back into the node if it is already opened. Ctrl-W will REMOVE the node from the parent patch



Dynamic Plugins

These nodes are C# plugins, you can open and edit them in the CodeEditor

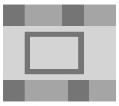


Effects

These nodes are HLSL shaders, you can open and edit them in CodeEditor

right-clicking on these nodes opens CodeEditor in an external window. There is the same CodeEditor for C# and HLSL - vvvv runs it automatically.
You can edit code whilst your patch is running, and you can 'compile' to apply your chages by saving the code with Ctrl-S

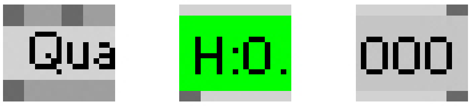
Ctrl-W closes the CodeEditor but leaves the node inside the patch



Nodes with external windows

These nodes have an external window, you can open it by pressing Alt-1 whilst the node is selected

Alt-1 opens an external window
Alt-2 opens the window as a block inside the patch
Alt-3 hides the external window
Alt-Enter forces window to be FullScreen



Native nodes without external windows

You can change the values of their input pins only, but nothing inside the nodes

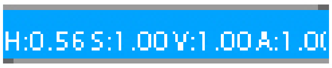
changing values

You can change values of IOBoxes or nodes pins using the mouse and keyboard.

Move your mouse over an IOBox, hold down the right mouse button and drag up-down or left-right to change the value of the IOBoxes

Double left click on an IOBox to change its value using keyboard input

Editing IOBox (Color) is a bit more complex.

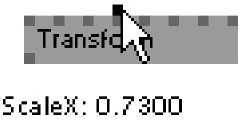


Hold down the right mouse button on an IOBox and move the mouse left-right to change the hue

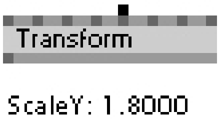
Hold down the right mouse button on an IOBox and move the mouse up-down to change the lightness

Ctrl + Hold down the right mouse button on an IOBox and move the mouse to change the saturation

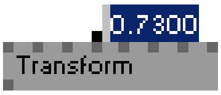
Shift + Hold down the right mouse button on an IOBox and move the mouse to change the opacity



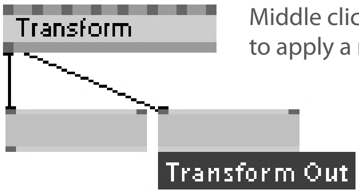
Mouse over tooltip shows a pin's current value



Hold down the right mouse button on a pin and move the mouse up-down or left-right to change the pin values.



Right click on a pin to change its value using keyboard input



Middle click on a connected IOBox to apply a relevant DescriptiveName

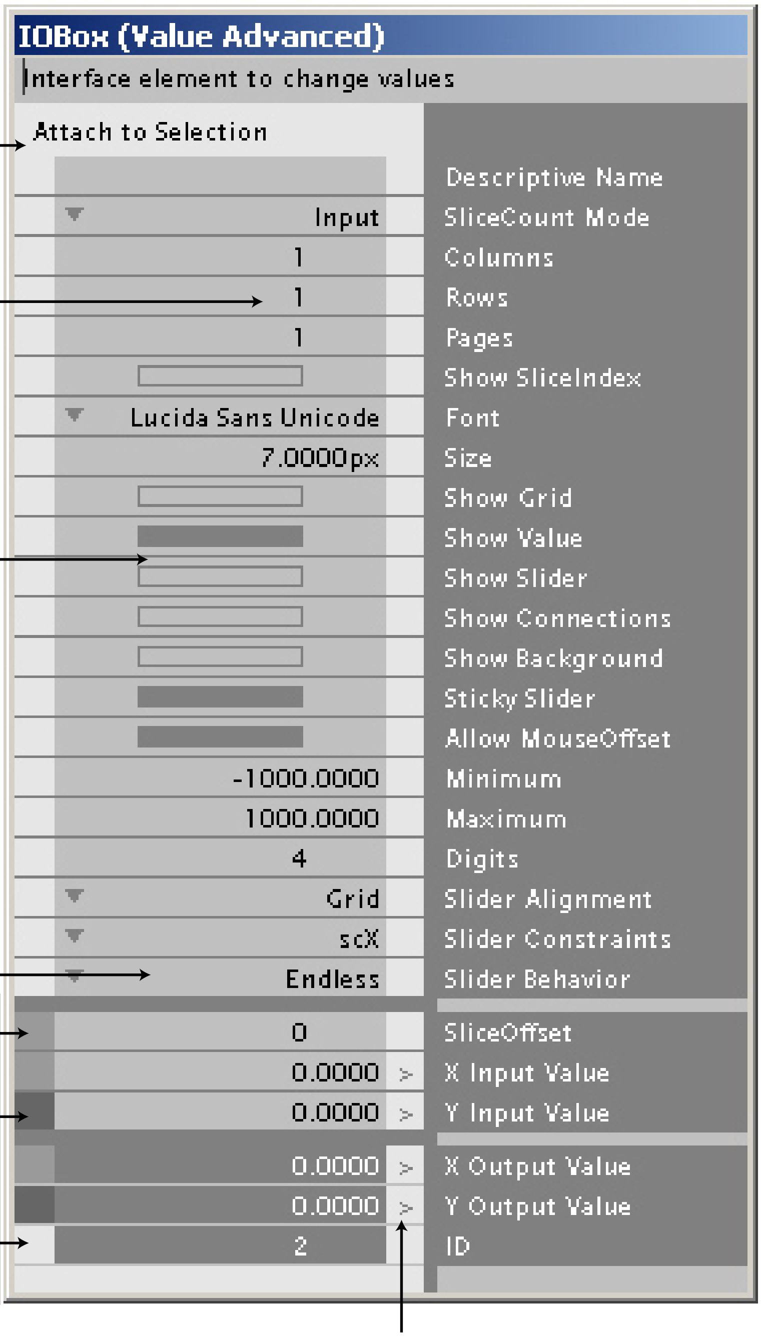
You can also change all these values in the Inspektor.

Herr Inspektor

Always keep at least one Inspektor open. **ALWAYS.**
To open the Inspektor. Press Ctrl-i. Then whenever you select a node, it will be shown in the Inspektor automatically. To open another Inspektor, whilst you already have one opened, press Shift-Ctrl-i

0.0000

IOBox (Value Advanced) Inspektor screenshot



IOBox (Value Advanced)

Interface element to change values

Attach to Selection

	Descriptive Name
Input	SliceCount Mode
1	Columns
1	Rows
1	Pages
□	Show SliceIndex
Lucida Sans Unicode	Font
7.0000px	Size
□	Show Grid
■	Show Value
□	Show Slider
□	Show Connections
□	Show Background
■	Sticky Slider
■	Allow MouseOffset
-1000.0000	Minimum
1000.0000	Maximum
4	Digits
Grid	Slider Alignment
scX	Slider Constraints
Endless	Slider Behavior
0	SliceOffset
0.0000 >	X Input Value
0.0000 >	Y Input Value
0.0000 >	X Output Value
0.0000 >	Y Output Value
2	ID

Left click on "Attach to Selection", to force the Inspektor to always show data for that selected node

Settings to create an IOBox which looks and acts like a table

Right click on values works the same as with IOBoxes

Settings to make your IOBox act like sliders or button

Grey squares are for hidden pins

Dark Grey squares are for visible pins

Light Grey squares are for invisible pins

Settings pins. You can not change these in the patch. You can see these only in the Inspektor.

Input/Output pins. You can change these values from the patch.

You can change the visibility of pins by clicking on these squares

A triangle shows that the pin is spreadble
A double triangle shows that the pin is already a spread

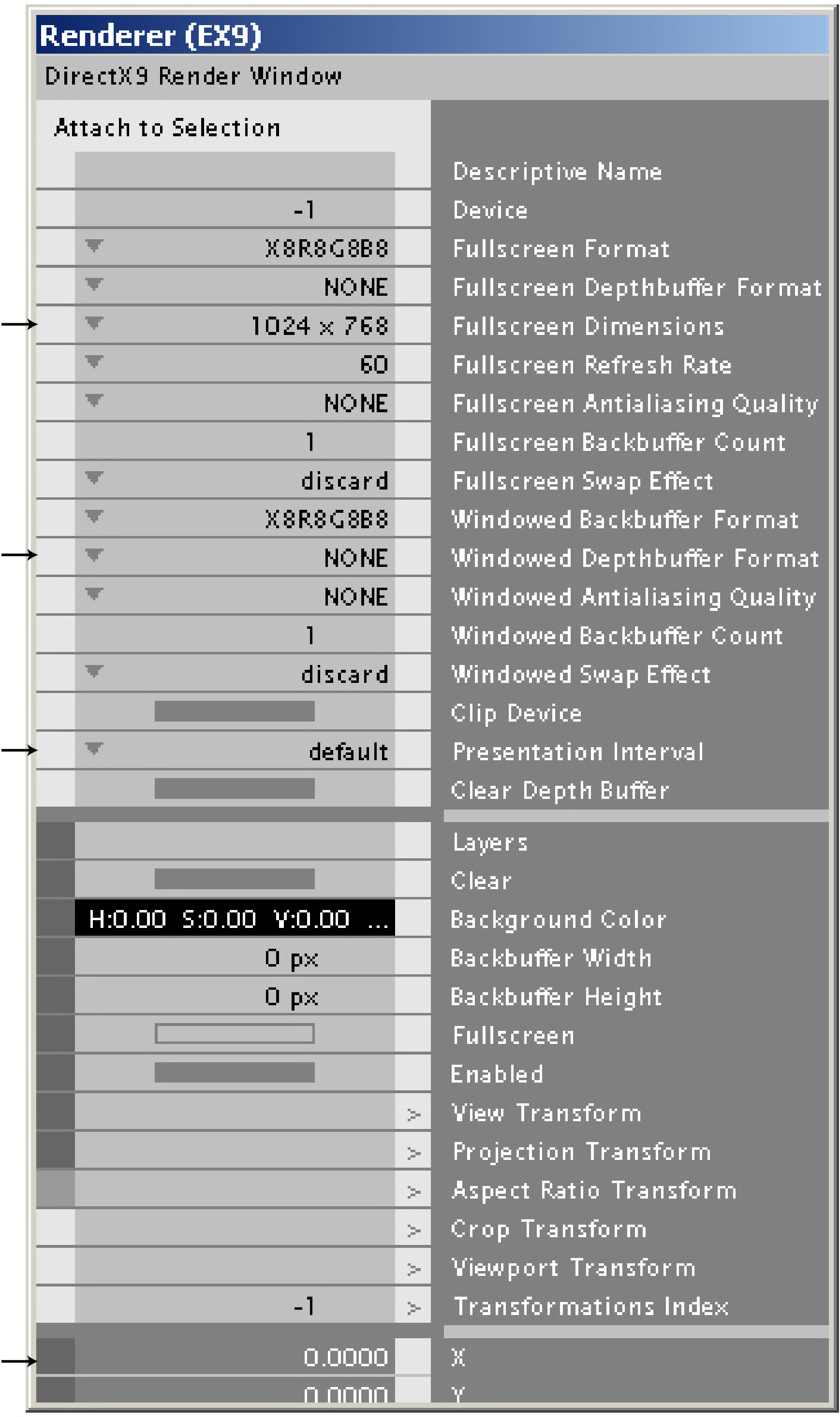
Click on an array to show the whole spread in the right column of the Inspektor

http://vvvv.org/documentation/tutorial-inspektor

Herr Inspektor

Always keep at least one Inspektor open. **ALWAYS.**
To open the Inspektor. Press Ctrl-i. Then whenever you select a node, it will be shown in the Inspektor automatically. To open another Inspektor, whilst you already have one opened, press Shift-Ctrl-i

Renderer (EX9) Inspektor screenshot



Renderer (EX9)

DirectX9 Render Window

Attach to Selection

	Descriptive Name
-1	Device
X8R8G8B8	Fullscreen Format
NONE	Fullscreen Depthbuffer Format
1024 x 768	Fullscreen Dimensions
60	Fullscreen Refresh Rate
NONE	Fullscreen Antialiasing Quality
1	Fullscreen Backbuffer Count
discard	Fullscreen Swap Effect
X8R8G8B8	Windowed Backbuffer Format
NONE	Windowed Depthbuffer Format
NONE	Windowed Antialiasing Quality
1	Windowed Backbuffer Count
discard	Windowed Swap Effect
	Clip Device
default	Presentation Interval
	Clear Depth Buffer
	Layers
	Clear
H:0.00 S:0.00 V:0.00 ...	Background Color
0 px	Backbuffer Width
0 px	Backbuffer Height
	Fullscreen
	Enabled
	View Transform
	Projection Transform
	Aspect Ratio Transform
	Crop Transform
	Viewport Transform
-1	Transformations Index
0.0000	X
0.0000	Y

You can set any resolution your graphic card supports.

Always set a depth buffer whenever working with 3D scenes

Helpful in terms of performance tricks.

The Renderer node outputs the mouse position within the Renderer window. You can use it instead of the Mouse (System Window) node.

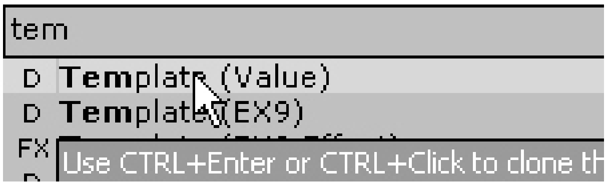
The settings pins of the Renderer node are extremly useful. These determine half of the result that you finally see.

Note that the Renderer's transfrom inputs are spreadable.

http://vvvv.org/documentation/tutorial-inspektor

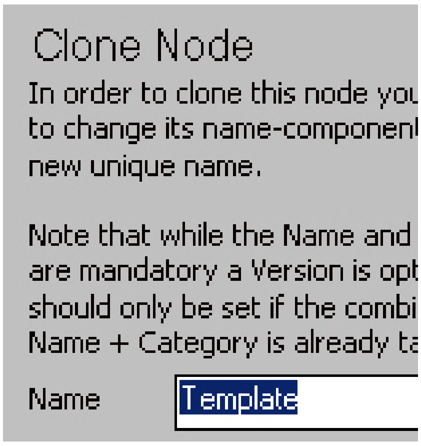
CodeEditor

vvvv has a built-in textual editor for HLSL e_ects and C# plugins.
With it you can edit contributions or start working on your own plugins or shaders.
To start from scratch, find Template nodes within the NodeBrowser,
select one and press Ctrl-Enter or Ctrl-left click to clone that template into your patch.



```
tem
D  Template (Value)
D  Template (EX9)
FX
Use CTRL+Enter or CTRL+Click to clone th
```

Find Template nodes in the NodeBrowser, and clone them into your patch using Ctrl-Enter.
Set a new name and version in the Clone Node window.



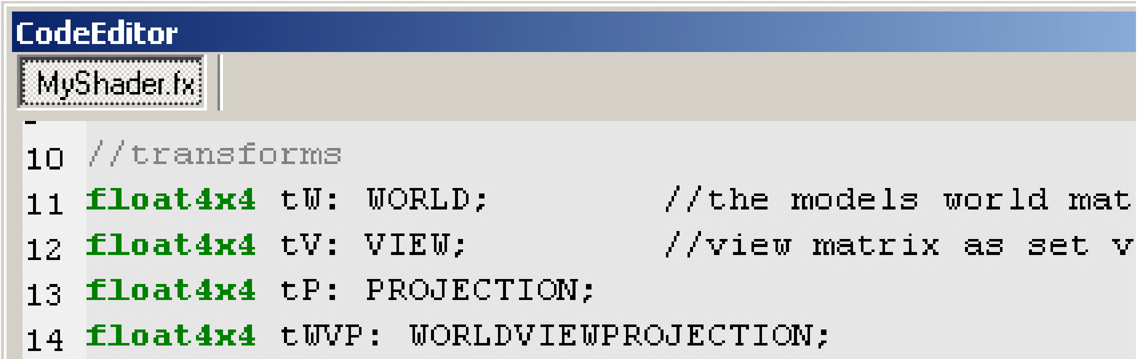
Clone Node

In order to clone this node you
to change its name-component
new unique name.

Note that while the Name and
are mandatory a Version is opt
should only be set if the combi
Name + Category is already ta

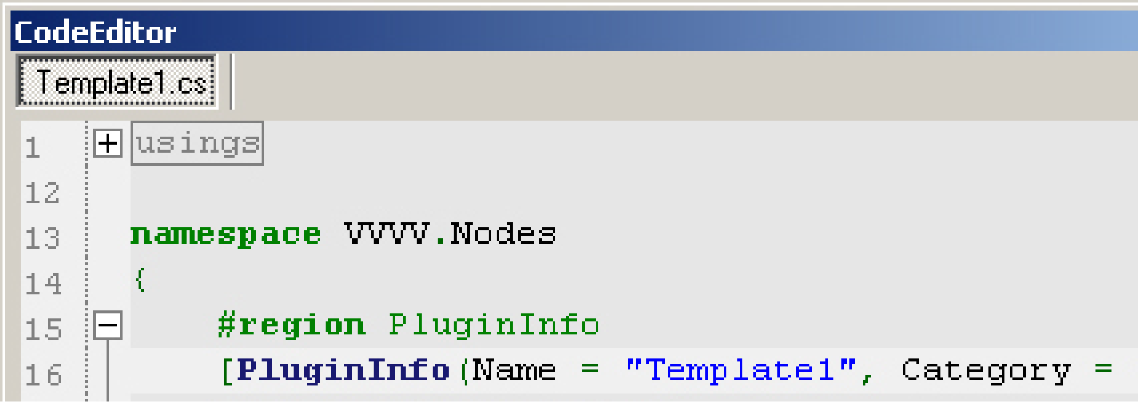
Name: Template

You don't need to wory about choosing the right CodeEditor for C# or HLSL,
vvvv chooses the right one for you.



```
//transforms
float4x4 tW: WORLD;         //the models world mat
float4x4 tV: VIEW;          //view matrix as set v
float4x4 tP: PROJECTION;
float4x4 tWVP: WORLDVIEWPROJECTION;
```

http://vvvv.org/documentation/ex9.effect.file



```
usings

namespace VVVV.Nodes
{
    #region PluginInfo
    [PluginInfo(Name = "Template1", Category =
```

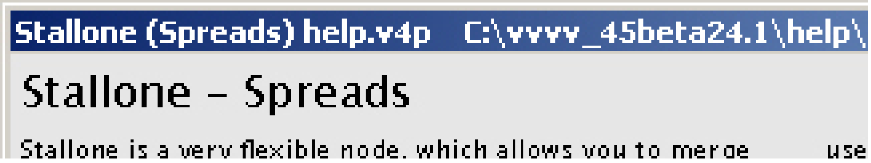
http://vvvv.org/documentation/plugins

how to read patches

Since vvvv is very visual in nature, it is much easier to read its patches than textual programming code.
To trace where things are going or where things come from, all you need to do is simply follow back along the links. And there are more options and tricks to make exploring more comfortable.
Before you start, open an Inspektor window with Ctrl-i. Believe me, you will need it!

Most nodes have supporting help-patches. To see the help patch for a node, select the node and press F1

Select a node with left click, and press F1 to open its help-patch



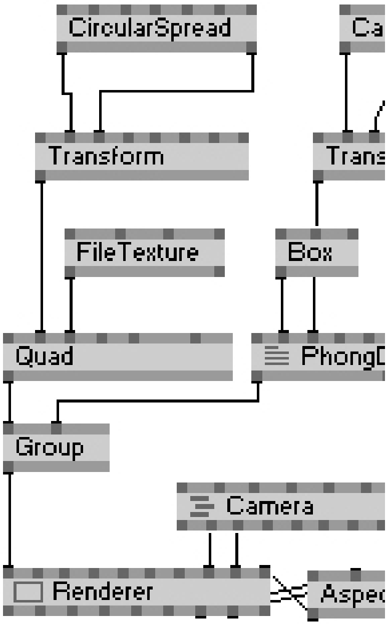
Stallone (Spreads) help.v4p   C:\vvvv_45beta24.1\help\

Stallone - Spreads

Stallone is a very flexible node, which allows you to merge   use

A simple trick for faster reading of other peoples patches (e.g. help-patches or /girlpower).

Try to read the patch from down to up, rather than from up to down.
As you can remember, most things in the patch finally end up in a Renderer.
The things that you see in the Renderer are the result of the whole patch.
So first, find the main Renderer (you may note, there are several renderers in complex patches). Usually it looks something like the patch to the right



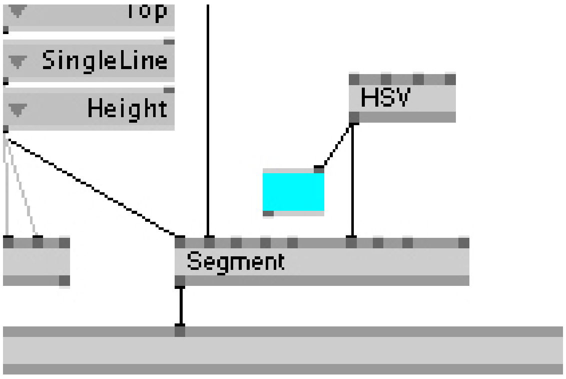
Now, just follow the link to the Renderers Layer input pin, back up from the previous output. In most cases connected to the Renderer, you should find a Quad(DX9), some shader node or group of both.
Feel free to play with their transfroms, color and texture pins.

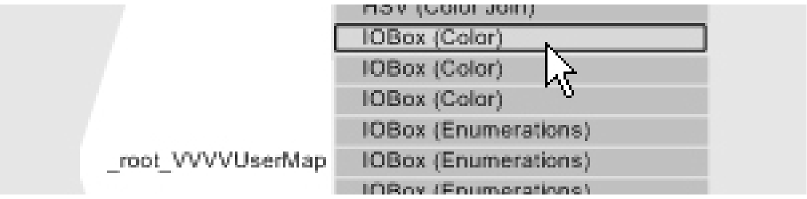
All abstract mathematics usually goes into Transfrom nodes.
Don't worry too much about destroying links, since you can easily undo changes by pressing Ctrl-Z.

In case of a subpatch, there may be no Renderer at all. But you can actually do the same, by following from output to inputs.

To find nodes in complex patches use Finder (availble since vvvv45_beta25)

Finder has an external window, it opens with Ctrl-F





Simply click the node you want from the Finder list, and vvvv shows it to you in the patch

vvvv links

http://vvvv.org/

vvvv itself. Modern and very comfortable web-site, where you will spend a lot of time.

http://vvvv.org/forums

A place to find answers to most of your questions.

http://vvvv.org/contributions

Useful and lovely stuff, developed by vvvv users.

http://vimeo.com/channels/vvvv

vvvv channel on Vimeo showcases works created by users. The place to see the power of vvvv yourself. Much better than somebody trying to explain "the power of vvvv is..."

http://www.flickr.com/groups/vvvv/pool/

Beautiful screenshots shared by users. Most pictures are completely created with vvvv.

http://meso.net/DIProjects

MESO is a media design company from Frankfurt, Germany and single vvvv distributor. Overview of their various installations, mostly realised with vvvv.