TouchDesigner - Day1

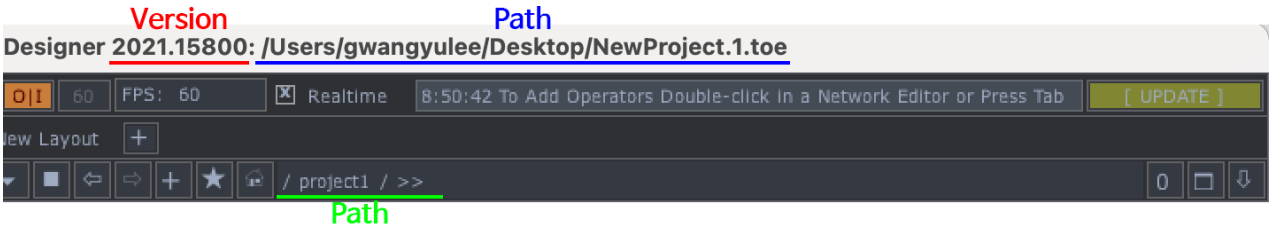
Interface, Operators preview, CHOP & Instancing

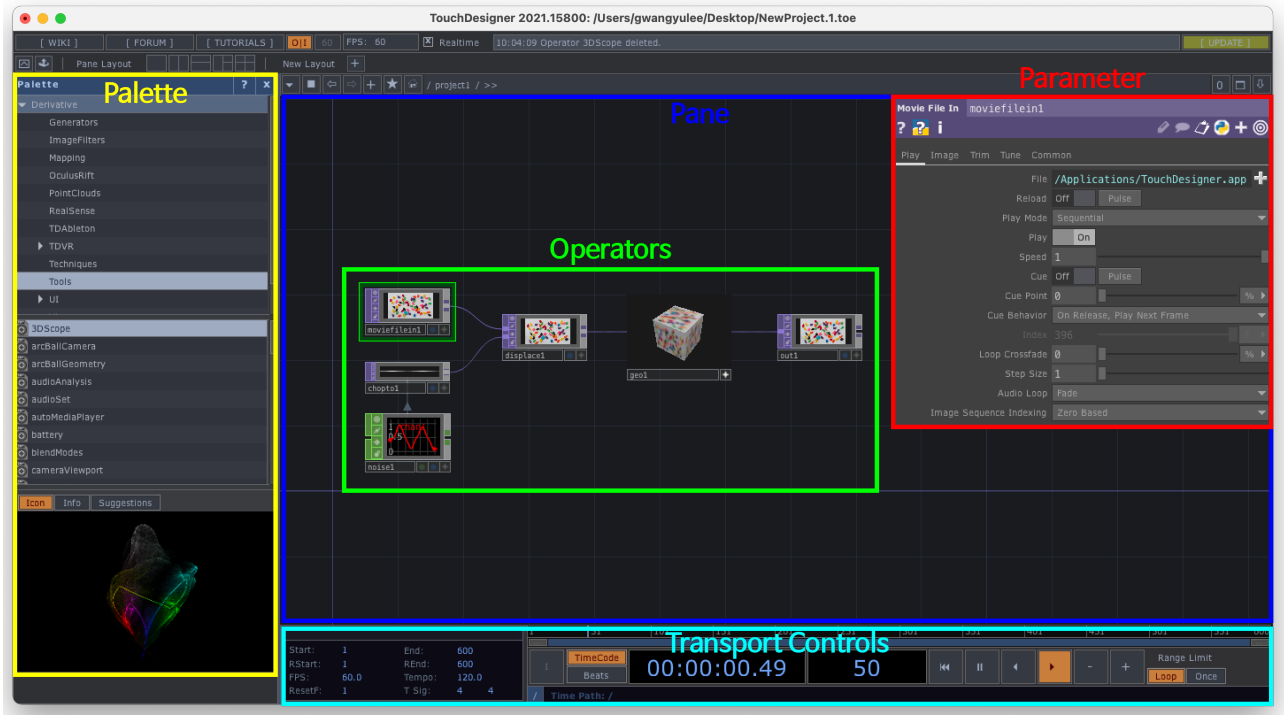
https://derivative.ca/download
https://drive.google.com/drive/folders/1ypivVF721NvTbnshr7JtZdbNXmek15Py?usp=sharing

What is TouchDesigner?

Node Based / Real-Time

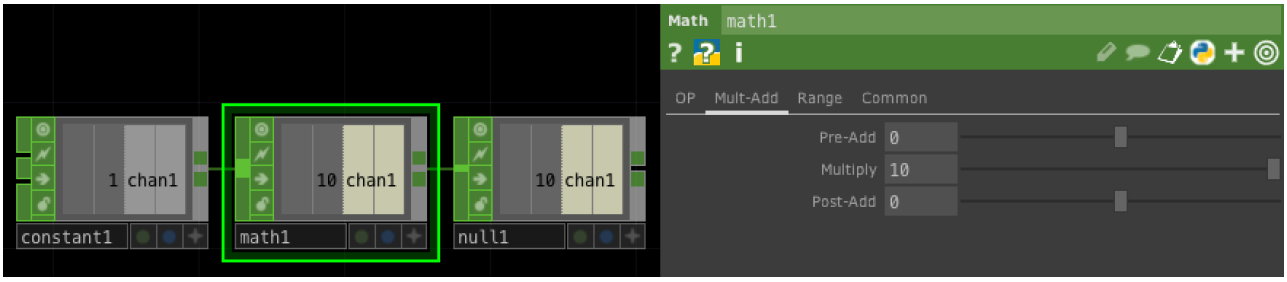
Interface



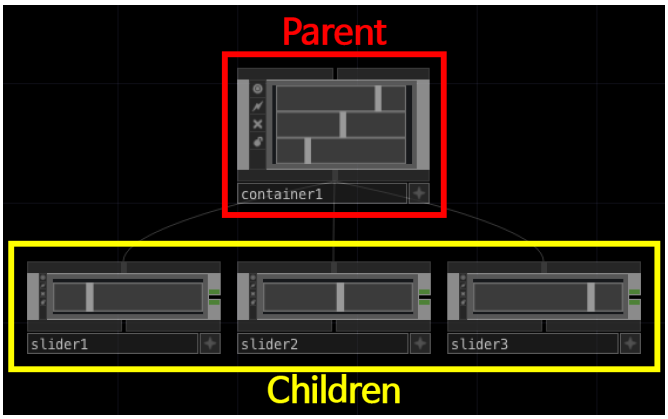


Signal Flow

All data in TouchDesigner flows from left to right.

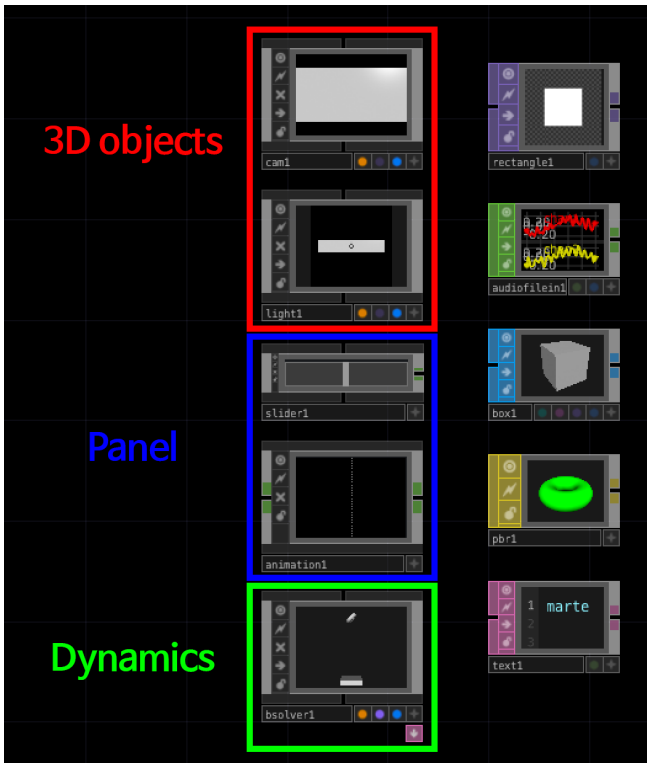


Components, interestingly, have the same data signal flow as Operators, flowing from left to right, but they are also capable of parent and child relationships, which flow from top to bottom.



Operator Families

COMP	Component (3D objects, panel, and dynamics)
TOP	Texture Operator (2D)
CHOP	Channel Operator (Signal)
SOP	Surface Operator (3D)
MAT	Material Operator
DAT	Data Operator



Shortcuts

088

TOUCHDESIGNER

Keyboard shortcuts to help you get around TouchDesigner more quickly. TouchDesigner's shortcuts are user-definable, but these are some defaults based on version 088. A 3-button mouse is required. Learn more at derivative.ca/wiki

GENERAL

Undo	**Ctrl+z**
Redo	**Ctrl+y**
Cut	**Ctrl+x**
Copy	**Ctrl+c**
Paste	**Ctrl+v**
Select Operator	**LMB**
Box Select	**RMB-drag**
Delete Selection	**Delete or Backspace**
Add to Selection	**Shift+Select**
Pan Network	**LMB-drag**
Zoom Network	**MMB-drag or Scrollwheel**
Operator Info	**MMB on Operator**
Play/Pause	**Space**
Perform Mode Enter/Exit	**F1/Esc**

FILES

New File	**Ctrl+n**
Open File	**Ctrl+o**
Save	**Strl+s**
Save As	**Ctrl+Shift+S**
Import File	**Ctrl+I**
Export Movie	**Ctrl+m**
Quit	**Ctrl+q**

DIALOGS

Preferences	**Alt+p**
About TouchDesigner	**Alt+Shift+V**
Explorer	**Alt+e**
Textport and DATs	**Alt+t**
Performance Montior	**Alt+y**
Window Placement	**Alt+w**
Palette	**Alt+l**
MIDI Device Mapper	**Alt+d**
Console	**Alt+c**
Key Manager	**Alt+k**
Search	**Alt+s**

NETWORK EDITOR

Parameters Show/Hide	**p**
List View Show/Hide	**l**
Add Operator	**tab or doubleclick**
Jump Up Network	**u**
Jump In Network	**i or Enter**
Add Group	**Shift+G**
Groups Show/Hide	**g**
Find Operator	**Ctrl+f**
Open Current OP Viewer	**v**
Load .tox file (COMP)	**Shift+X**
Viewer Active Always On	**Shift+A**
Toggle Selected Viewer Active	**a**
Select All	**Ctrl+a**
Layout All/Selected	**l/Shift+L**
Home All/Selected	**h/Shift+H**
Unity Frame All/Selected	**f/Shift+F**
Fixed-size Operator Names	**n**
Link Straight	**s**
Data Links Show/Hide	**x**
Network Overview	**o**
Color Palette for Operators	**c**

PANE OPTIONS

Split Left/Right	**Shift+[**
Split Top/Bottom	**Shift+]**
Floating Copy	**Alt+Shift+C**
Maximize	**Alt+`**
Close	**Alt+z**
Network Editor	**Alt+1**
Panel	**Alt+2**
Geometry Viewer	**Alt+3**
TOP Viewer	**Alt+4**
CHOP Viewer	**Alt+5**
Animation Editor	**Alt+6**
Parameters	**Alt+7**
Textport and DATs	**Alt+9**

TOP VIEWERS

Pan	**LMB-drag**
Zoom	**MMB-drag**
Home	**h**
Display Pixel Values	**d**
Display Field Guide	**f**
Color	**c**
Red	**r**
Green	**g**
Blue	**b**
Alpha	**a**
Mono	**m**

CHOP VIEWERS

Pan	**LMB-drag**
Zoom	**MMB-drag**
Drag Channel	**LMB-drag on Channel Name**
Home	**h**
Single Sample View	
Reset Min/Max	**r**
Show Exact Values	**p**
Multiple Samples View	
Horizontal Adapt	**Shift+H**
Vertical Adapt	**Shift+V**
Samples/Frames/Seconds	**u**
Grid Low/Medium/High	**g**
Playhead	**t**
Time Scroll	**c**
Label	**l**
Handles	**n**
Dots	**d**
Extend Regions	**x**
Precision Labels	**p**
Raw Edits Tools	**e**
Scope Tools	**s**

SOP & OBJECT COMP VIEWERS

Tumble	**LMB-drag**
Pan	**RMB-drag**
Zoom	**MMB-drag**
Display Options	**p**
Home All/Selected	**h/Shift+H**
Frame All/Selected	**f/Shift+F**
Shaded/Wireframe	**w**
Ortho/Perpective	**o**
Select Viewport	**x**
Perspective Viewport	**Shift+P**
Top Viewport	**Shift+T**
Front Viewport	**Shift+N**
Right Viewport	**Shift+R**
Show Quad Viewport	**5**
Select Viewport 1/2/3/4	**1/2/3/4**

GEOMETRY VIEWER PANE

Switch States	**Use State Icons**
View Momentary	**Space-hold**
Select & Transform Momentary	**s-hold**
Construction Plane Momentary	**c-hold**
Select & Transform State	
Select Object	**LMB**
Box Select	**RMB-drag**
Handle Translate/Rotate/Scale	**t/r/e**
Handle Show/Hide	**y**
Align Handle with Object	**Shift+O**
Align Handle with View	**Shift+V**
Align Handle with World	**Shift+W**
Align Handle with C-Place	**Shift+F**
Handle Pivot Attached to Selection	**'**
Set Handle Pivot to Selection	**o**
Set Handle Pivot to World	**w**
Set Handle Pivot to C-Plane	**f**
Add Group	**Shift+G**
Copy	**Ctrl+c**
Paste	**Ctrl+v**
Delete	**Delete**

KEYFRAMING

Pan	**LMB-drag**
Zoom	**MMB-drag**
Select Key or Segment	**LMB**
Box Select	**RMB-drag**
Add to Selection	**Shift+Select**
Delete Selection	**Delete**
Add Keyframe	**Alt+LMB**
Add Keyframe to Selected	**Alt+MMB**
Add Keyframe to All	**Alt+RMB**
Home All/Selected	**h/Shift+H**
Home Horizontal	**Shift+F**
Home Vertical	**Shift+V**
Long Names	**n**
Scale Handle	**e**
Playhead to Next Key	**Ctrl+Right**
Playhead to Prev Key	**Ctrl+Left**
Break Selected Tangents	**t**

PARAMETERS

Show/Hide	**p**
Value Ladder	**MMB or LMB-hold**
Revert to Previous Value	**Ctrl+LMB**
Edit in External Editor	**Alt+e**

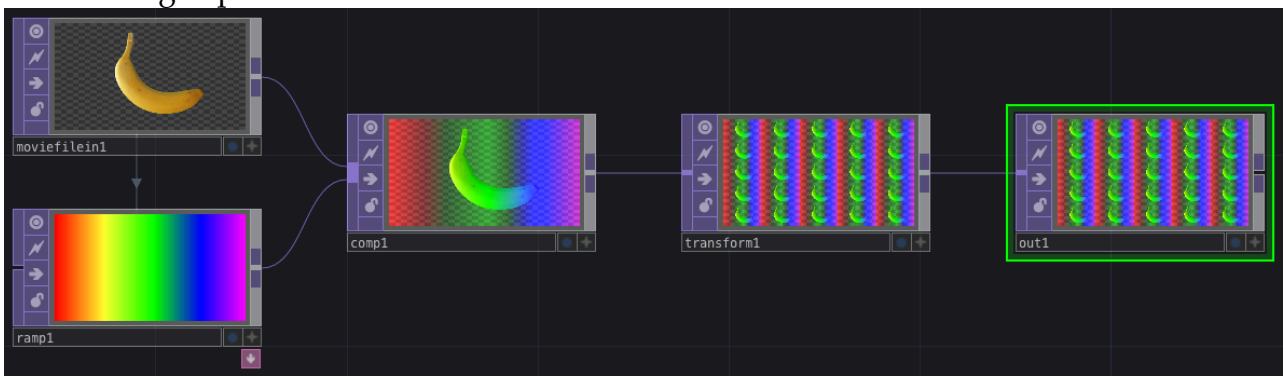
TEXTPORT

History Back/Forward	**Up/Down**
Find	**Ctrl+f**
Python/Tscript	**Ctrl+I**

DERIVATIVE.CA

TOP

All 2D image operations.



Movie File In : The Movie File In TOP loads movies, still images, or a sequence of still images into TOPs.

Circle : The Circle TOP can be used to generate circles, ellipses and N-sided polygons. The shapes can be customized with different sizes, rotation and positioning.

Rectangle : The Rectangle TOP can be used to generate Rectangles with rounded corners.

Tip : You could use an expression to connect all res parameters to your project container's width and height, or to a constant chop. For instance, putting 'me.parent().width' in your render TOP's resolution width parameter would connect it to the width of its container.

Ramp : The Ramp TOP allows you to interactively create vertical, horizontal, radial, and circular ramps.

Transform : The Transform TOP applies 2D transformations to a TOP image like translate, scale, rotate, and multi-repeat tiling. The background can be filled with solid color and alpha.

Add : The Add TOP composites the input images together by adding the pixel values. Output = Input1 + Input2.

Composite : The Composite TOP is a multi-input TOP that will perform a composite operation for each input. Select the composite operation using the Operation parameter on the Composite parameter page.

Render : The Render TOP is used to render all 3D scenes in TouchDesigner. You need to give it a Camera object and a Geometry object as a minimum.

Out : The Out TOP is used to create a TOP output in a Component. Component outputs are positioned alphanumerically on the right side of the Component.

CHOP

Motion, audio, animation and control signals.

Constant : The Constant CHOP creates new constant-value channels.

LFO : The LFO (low frequency oscillator) CHOP generates waves in real-time in two ways. It synthesizes curves using a choice of common waveforms like Sine or Pulse, or it repeats a prepared incoming curve.

Noise : The Noise CHOP makes an irregular wave that never repeats, with values approximately in the range -1 to +1.

Math : The Math CHOP performs arithmetic operations on channels.

Envelope : The Envelope CHOP outputs the maximum amplitude in the vicinity of each sample of the input.

Tip : The loudness levels of an audio track can be kept roughly constant by computing an envelope of the audio with a wide window, and then passing the original audio and the envelope to a Math CHOP and selecting Combine CHOPs - Divide. This will make the amplitude approximately 1.

Trail : The Trail CHOP displays a history of its input channels back in time. A window of time is displayed from the current frame back in time, the size of this window is set by the Window Length parameter.

Audio FIle In : The Audio File In CHOP reads audio from files on disk or at http:// addresses.

Audio Spectrum : The Audio Spectrum CHOP calculates and displays the frequency spectrum of the input channels.

Audio Device Out : The Audio Device Out CHOP sends audio to any of the attached audio output devices using DirectSound/CoreAudio or ASIO. The second input on the Audio Device Out CHOP can be used for volume control.

SOP

3D points, polygons and other 3D primitives.

Circle : The Circle SOP creates open or closed arcs, circles and ellipses.

Rectangle : The Rectangle TOP can be used to generate Rectangles with rounded corners.

Grid : The Grid SOP allows you to create grids and rectangles using polygons, a mesh, Bzier and NURBS surfaces, or multiple lines using open polygons.

Tip : You can turn on the wireframe. Click the viewer active button and press W. And also you can turn the points on. Right-click on the viewer and select Display Options (must be in View state if using the Geometry Viewer in a pane).

Sphere : The Sphere SOP generates spherical objects of different geometry types.

Box : The Box SOP creates cuboids.

Superquad : The Superquad SOP generates an isoquadric surface.

Torus : The Torus SOP generates complete or specific sections of torus shapes (like a doughnut).

Tube : The Tube SOP generates open or closed tubes, cones, or pyramids along the X, Y or Z axes.

Metaball : The Metaball SOP creates metaballs and meta-superquadric surfaces.

How to make Metaball in 2D : Make two Circles TOP, connect them to the Blur TOP and adjust a filter size. And put them together with Over TOP. And adjust contrast with Level TOP.

File In : The File In SOP allows you to read a geometry file that may have been previously created in the Model Editor, output geometry from a SOP, or generated from other software. The geometry file can be read in from disk or at http:// addresses.

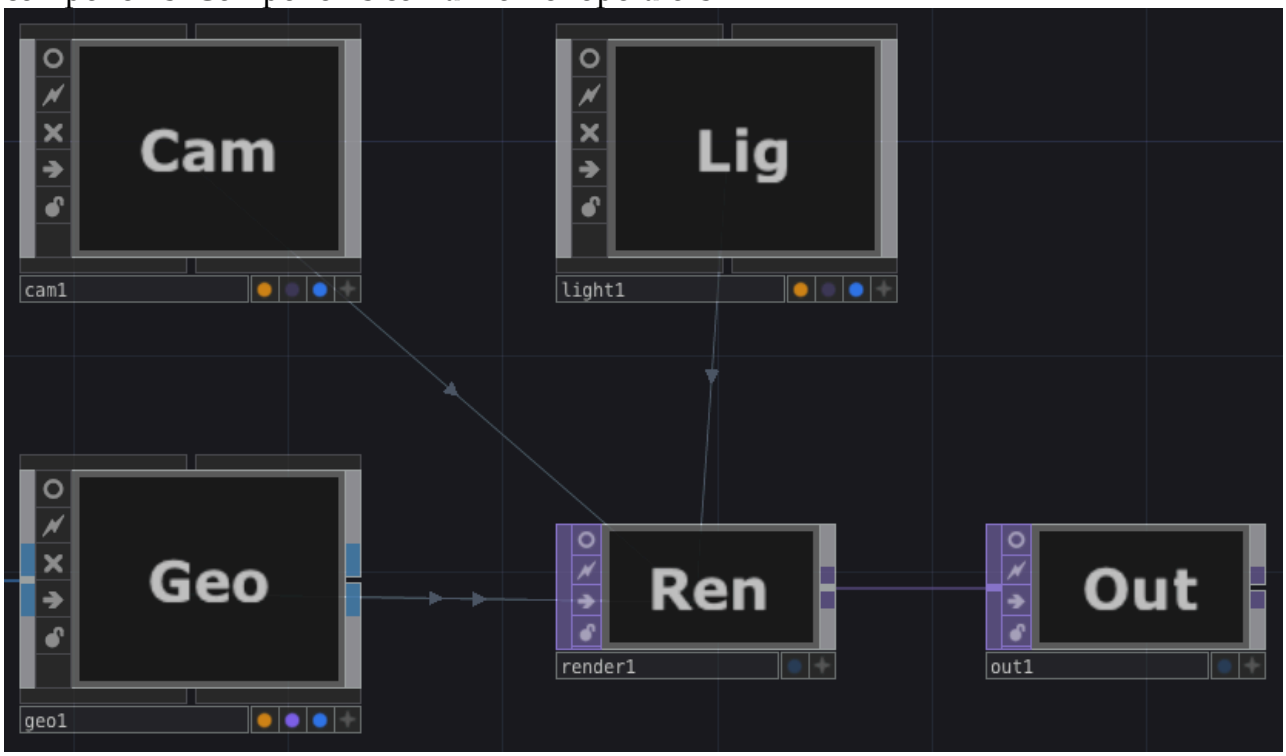
Transform : The Transform SOP translates, rotates and scales the input geometry in "object space" or local to the SOP.

Merge : The Merge SOP merges geometry from multiple SOPs.

Particle : The Particle SOP is used for creating and controlling motion of "particles" for particle systems simulations. Particle systems are often used to create simulations of natural events such as rain and snow, or effects such as fireworks and sparks. In Touch, the points of the input geometry are used as the starting positions of the particles. Each point of the input can be affected by external force (gravity) and wind. Particles can collide and bounce off another object, set by the Collision Source. They can also bounce off, or die at, limit planes set in X, Y and Z.

COMP

Object components (3D objects), Panel components (2D UI gadgets), and miscellaneous components. Components contain other operators.



Container : The Container Component groups together any number of button, slider, field, container and other Panel Components to build an interface.

Geometry : The Geometry Component is a 3D surface that you render in TouchDesigner with a Render TOP. Lights, Cameras and other Components affect the scene, but are not visible surfaces.

Tip : Use the split-screen and go on the Geometry Viewer.

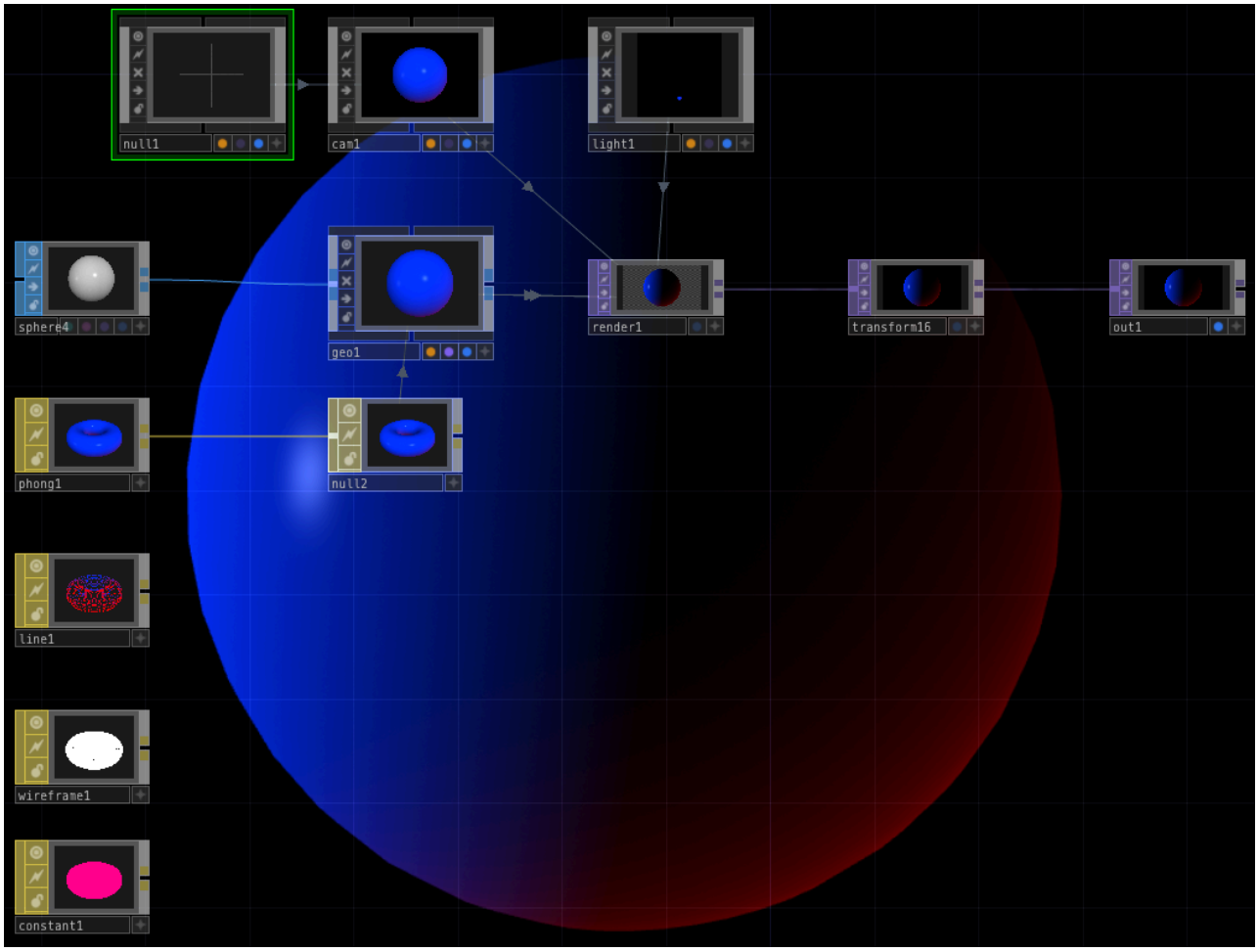
Camera : The Camera Component is a 3D object that acts like real-world cameras.

Tip: Make a Null COMP and drag it to the 'Look At' parameter. Then, the camera is always going to focus on this point.It's still going to look at that point even if you change the parameters of the Camera.

Light : The Light Components are objects which cast light into a 3D scene. With the light parameters you can control the color, brightness, and atmosphere of geometry lit by the light. A scene can also be viewed through a light's perspective, similar to a camera.

MAT

Materials and shaders



Null : The Null MAT has no effect on the data. It is an instance of the MAT connected to its input. It doesn't do much but comes in handy when building networks.

Constant : The Constant MAT renders a constant color on a material.

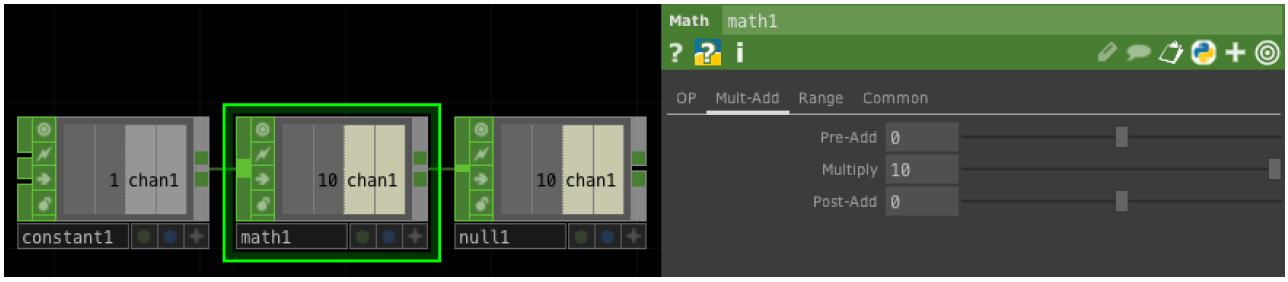
Wireframe : The Wireframe MAT renders the edges of polygons and curves as lines.

Line : The Line MAT renders 3D line segments, dots and vectors. The line width and color can be varied based on distance to the camera, using two models: a 1/z dropoff (z = distance from camera), or a near-far distance rolloff model, where you set the width and color at the near and far distances, and you vary three rolloff controls.

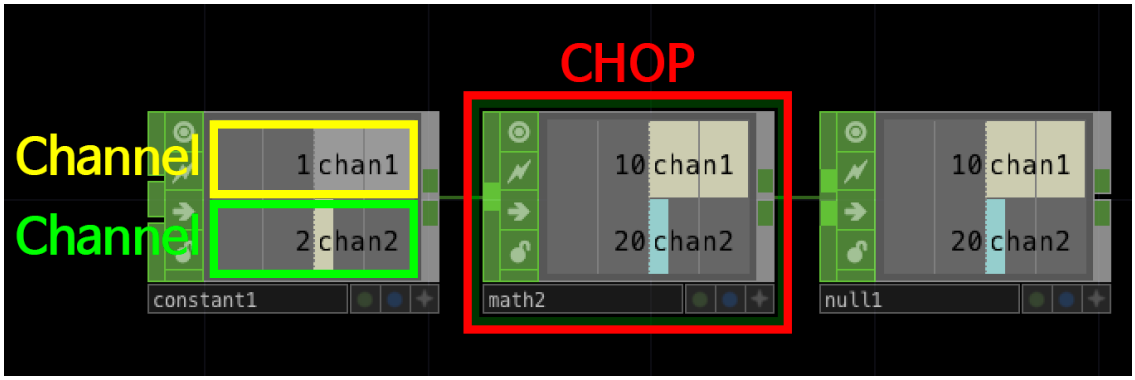
Phong : The Phong MAT creates a material using the Phong Shading model. It has support for textures, reflections, bumps, cone lights, rim lights, alpha maps and more. You can output its GLSL shader into two DATs for further adaptation in a GLSL MAT by using the Output Shader parameter.

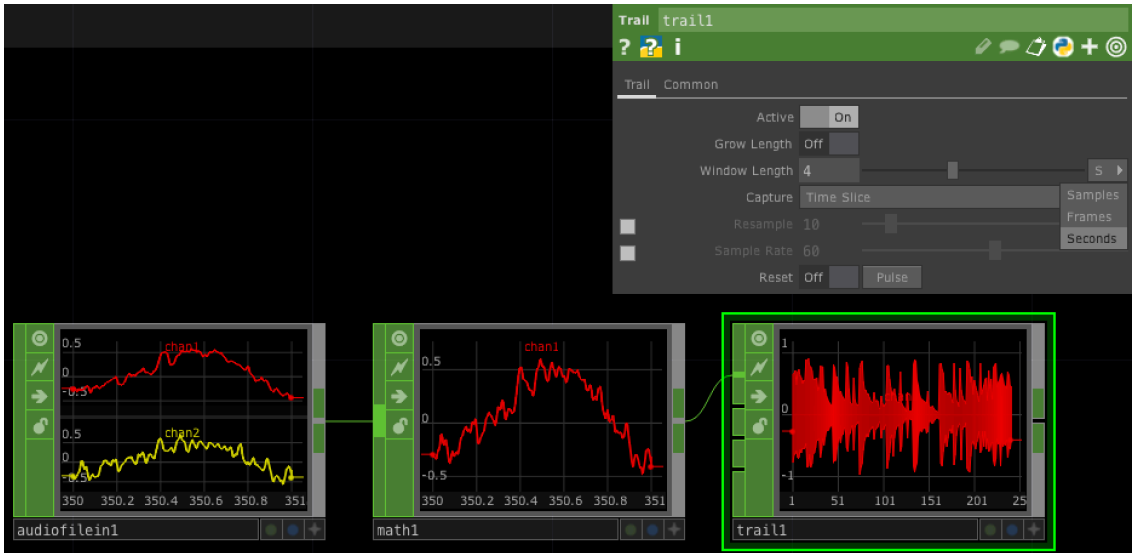
CHOP

Motion, audio, animation and control signals.

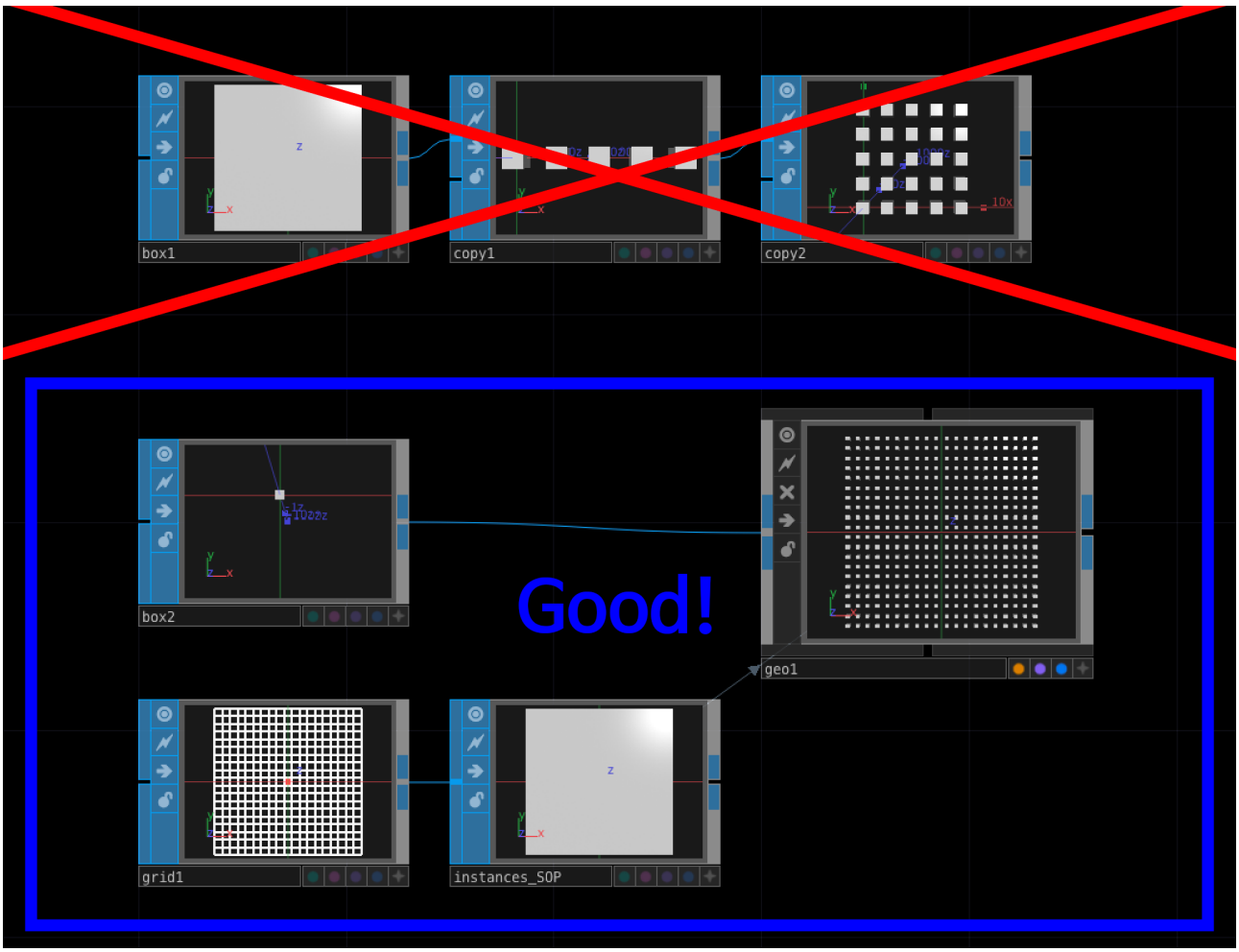


CHOP, channel, sample, and an array of samples?



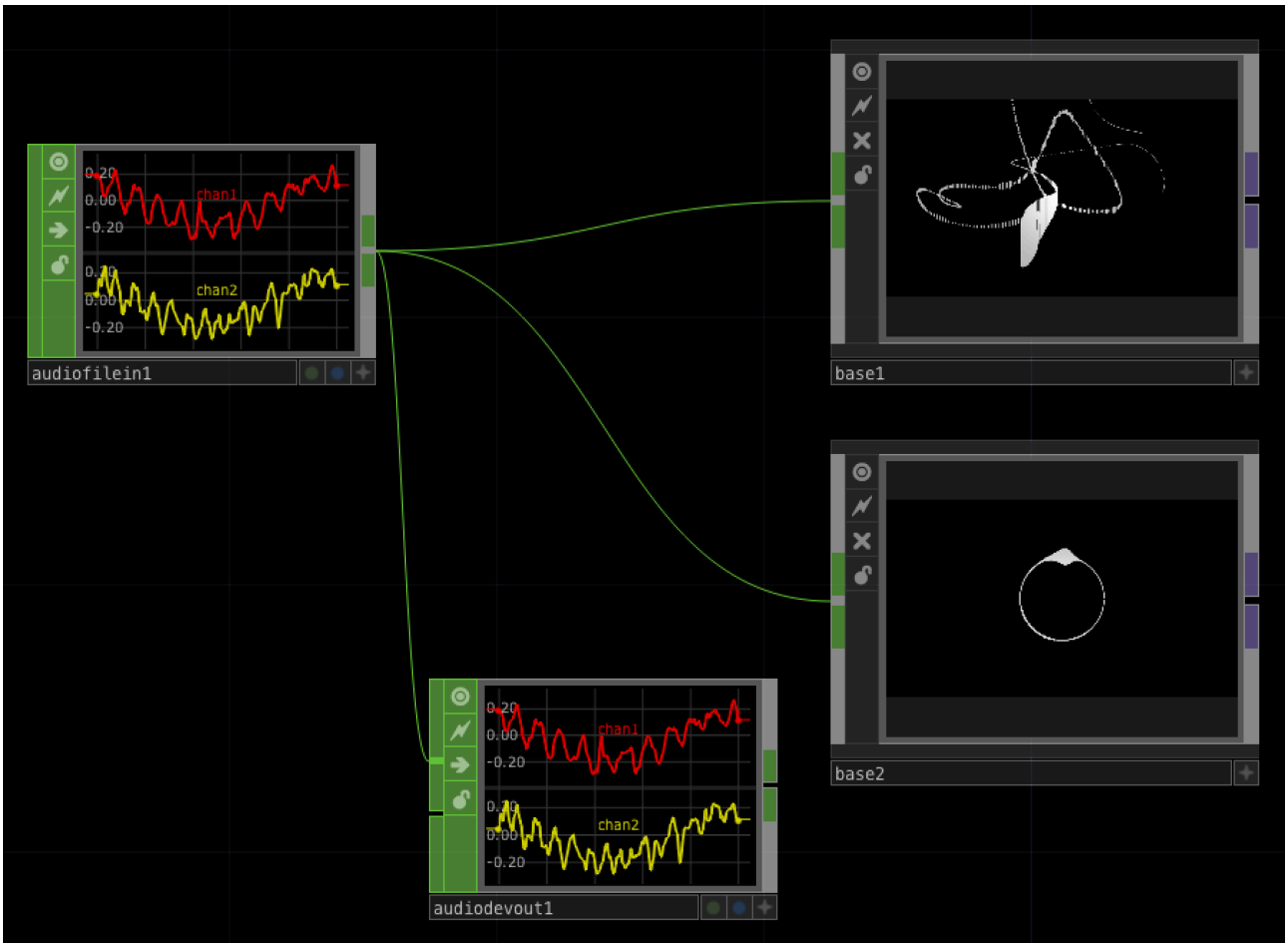


Instancing



Geometry instances in the Geometry Component are copies of the geometry object, which can be transformed independently. The Geometry COMP has an Instance parameter page to create instances. You can have one instance for every sample of a CHOP, row of a table, pixel of an image, or point of a SOP. Transformations of the instances can be made by supplying CHOP channels with X, Y, and Z and other data, for example.

과제


0.20
0.00
-0.20
chan1
chan2
audiofilein1
base1
base2
audiodevout1