

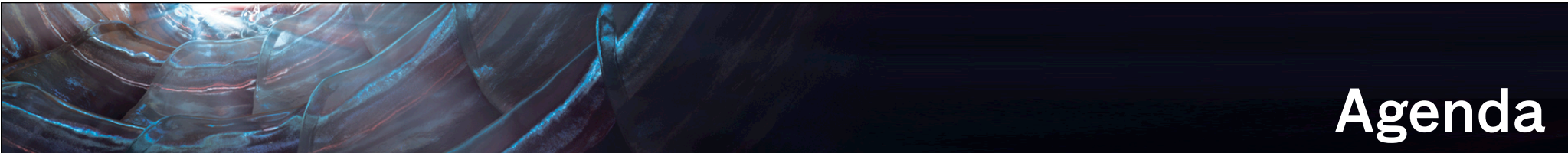
Houdini

Light, Shade, Render

M04: More VOP Shader Tricks

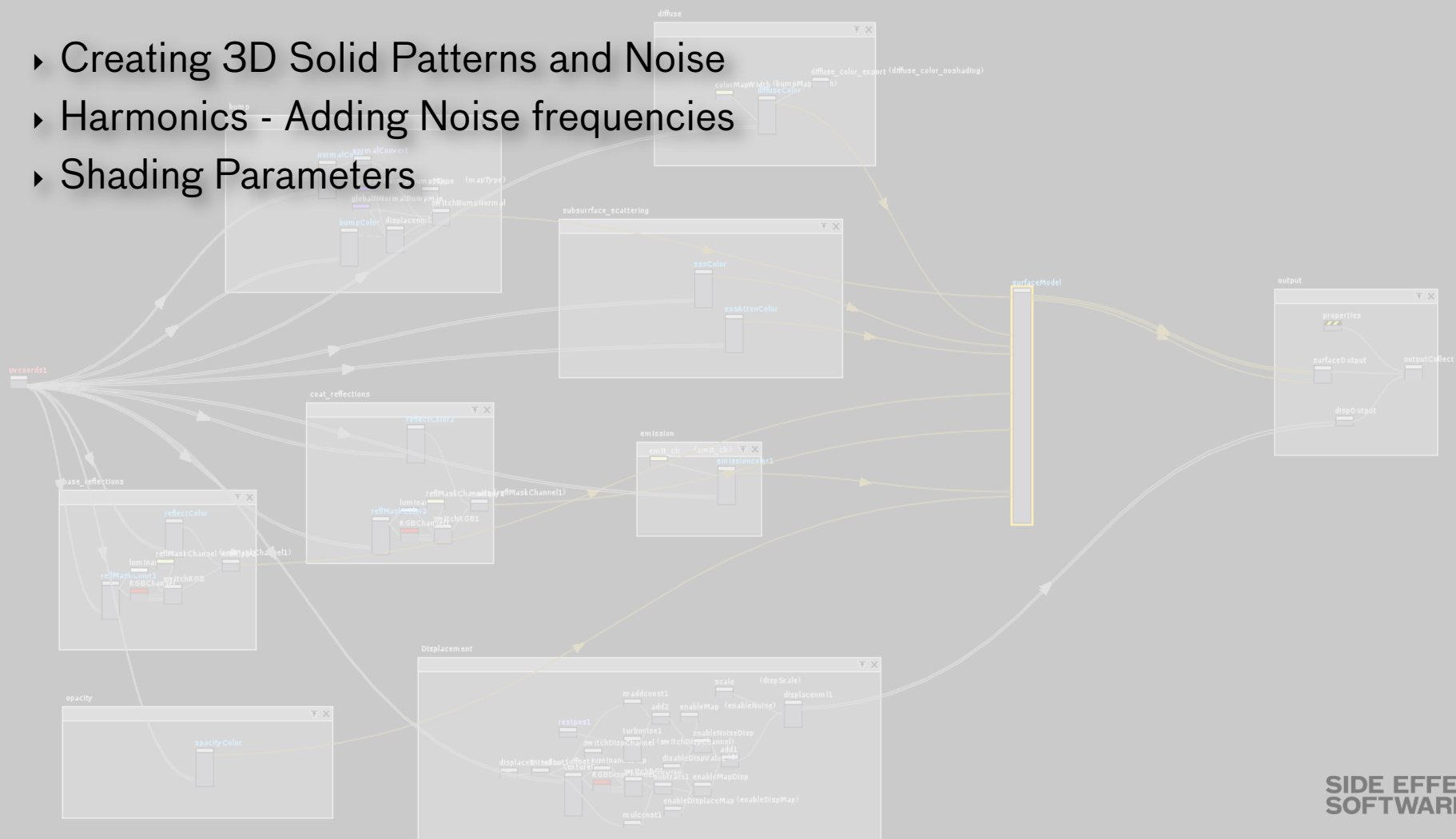
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SIDE EFFECTS
SOFTWARE



Agenda

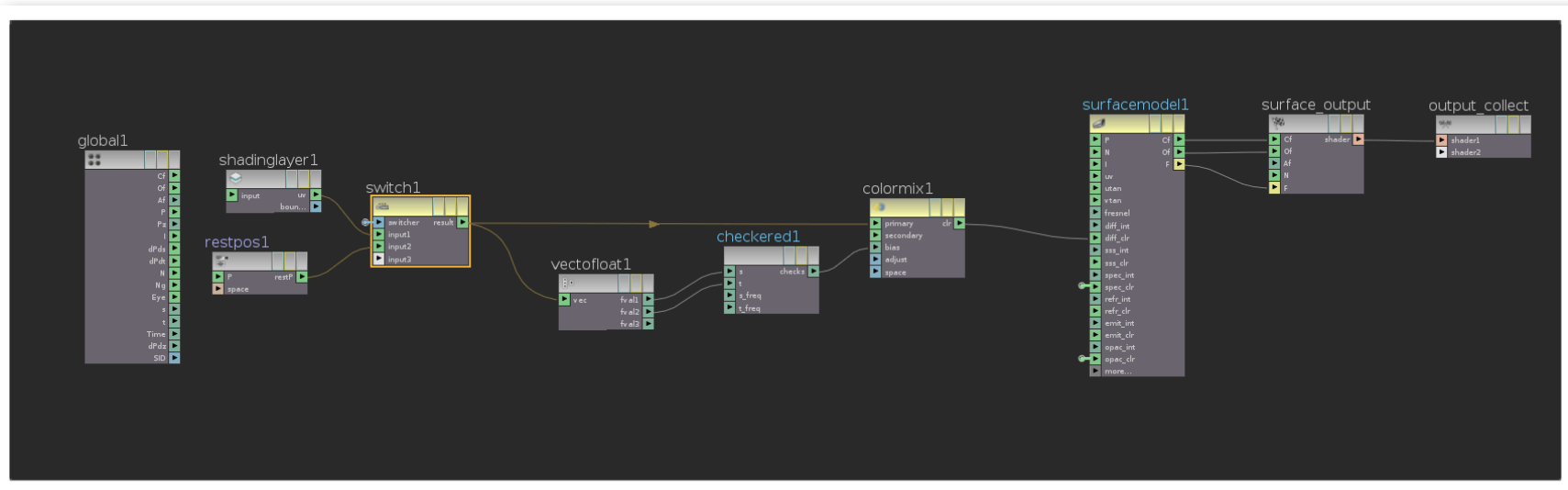
- ▶ Creating 3D Solid Patterns and Noise
- ▶ Harmonics - Adding Noise frequencies
- ▶ Shading Parameters



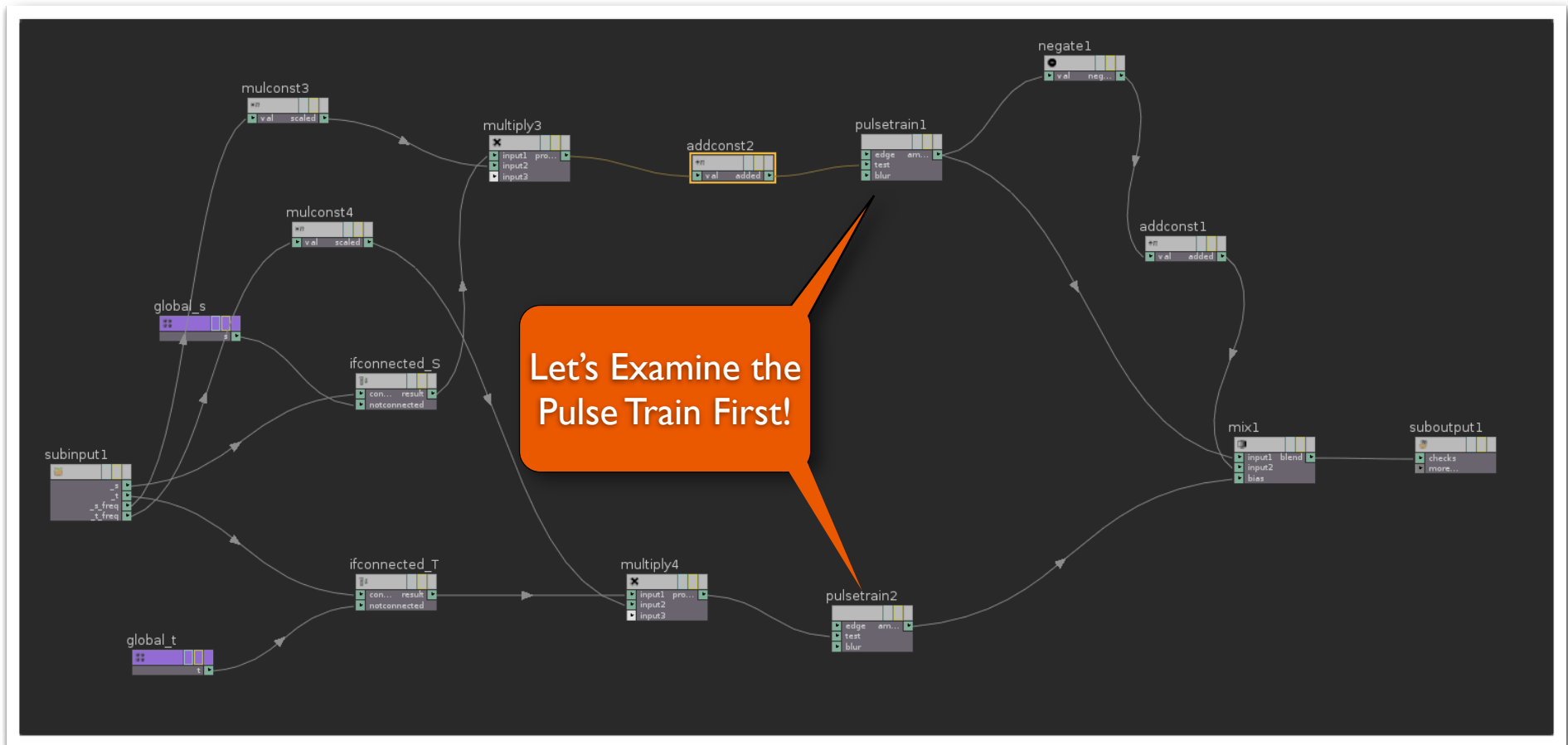
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3D Solid Pattern

- ▶ Start by dropping down a material shader
- ▶ Dive inside and add the following network to create a 2D Checker Pattern

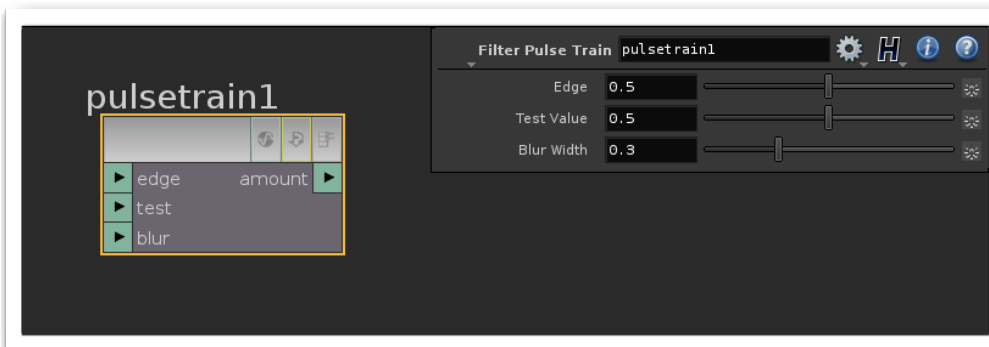


Examining the Internals of the Checkered Pattern

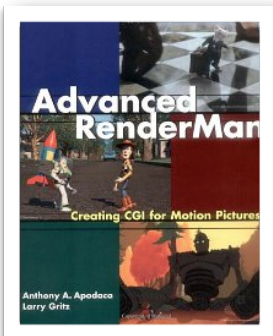


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Pulse Train



- Filters the input. - This function is used to soften edges by calculating the filtering amount.
- Edge - A floating point value used as the median value for the test value.
- Test - This should be hooked up to the value needing filtering.
- Blur - When this value is greater than 1, this value will soften the filtering.

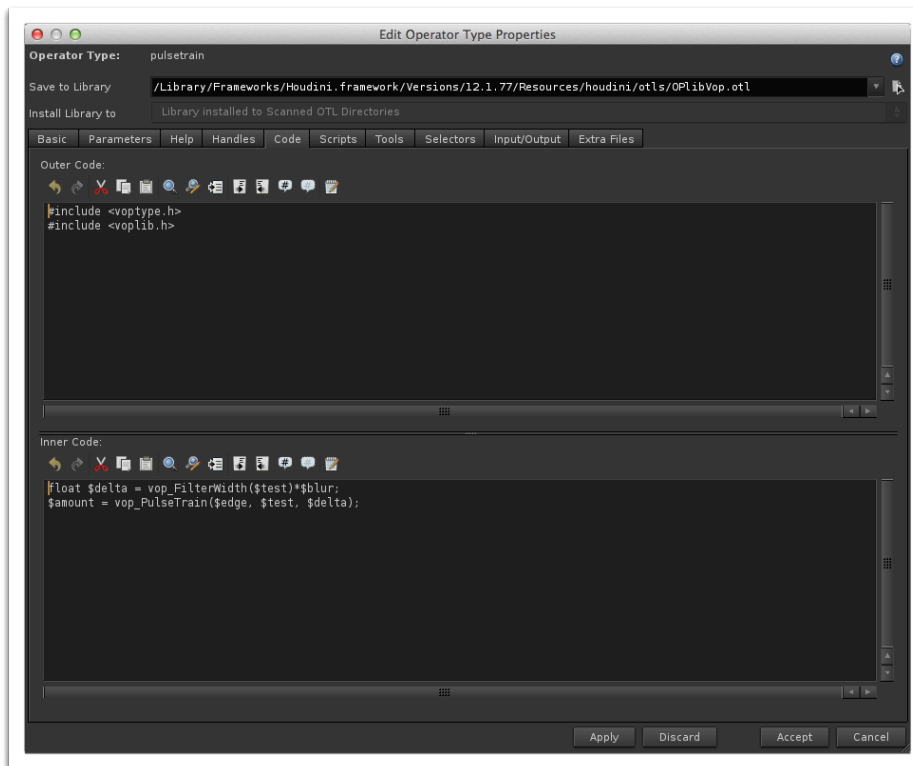


Chapter 11 for further reading - Advanced RenderMan:
Creating CGI for Motion Pictures, ISBN 978-1558606180

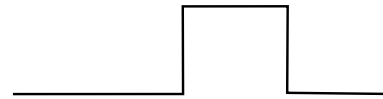
Houdini version
much more
sophisticated

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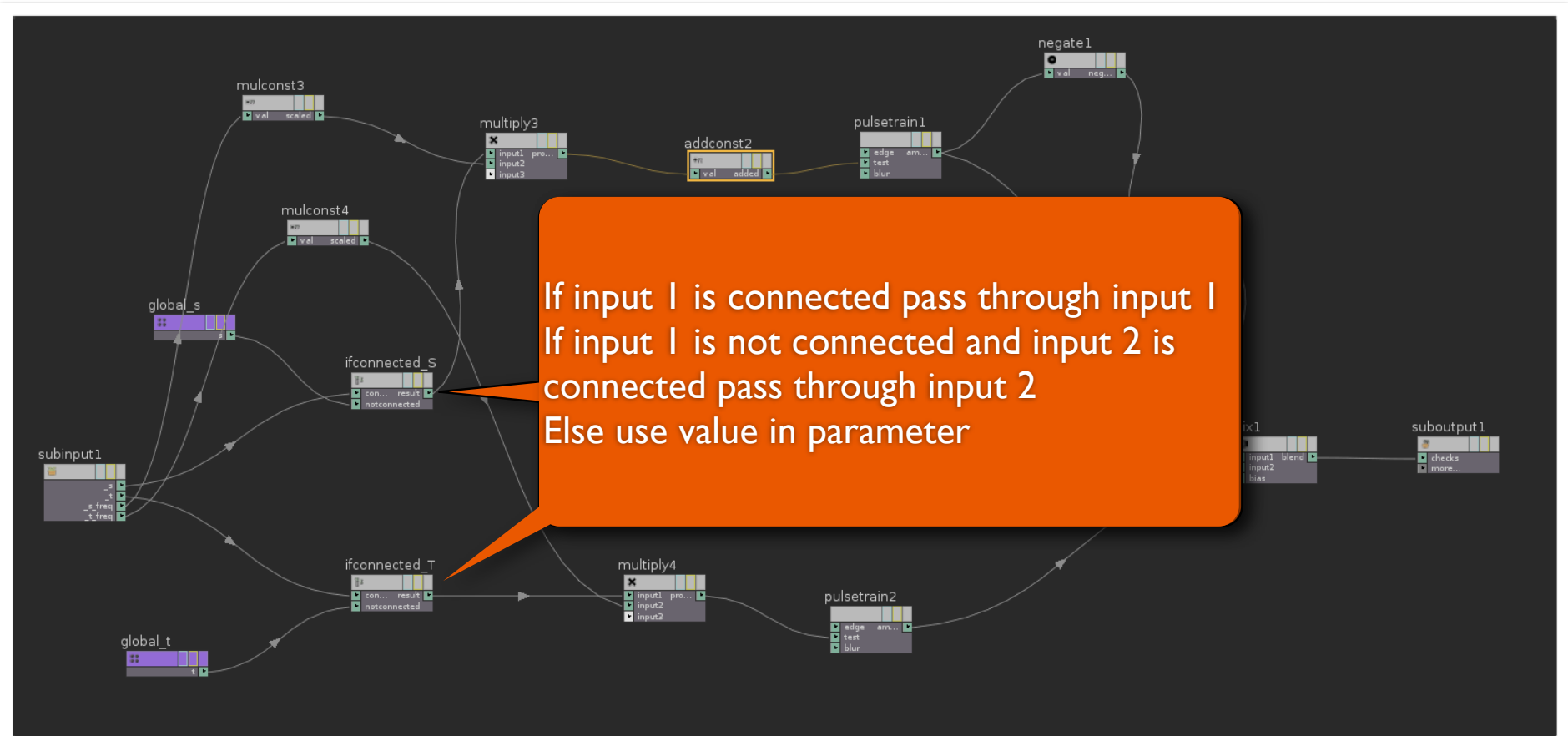
Code for Pulse train



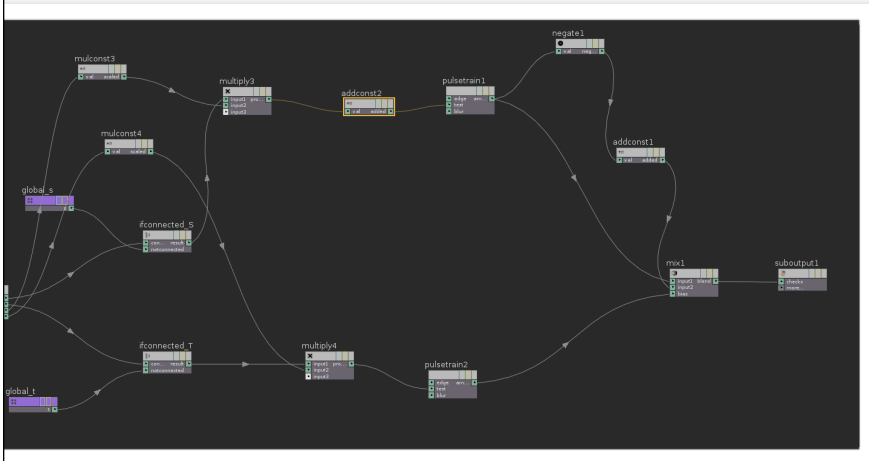
- ▶ Open the Type Properties for Pulse Train
- ▶ Code to the Code Tab
 - ▶ Notice the three arguments
 - ▶ edge - if edge is equal or close to equal the test case return a positive value, else return negative value
- ▶ Function you would use to draw lines or soften edges
- ▶ Basically a pulse train is creating a square wave



ifconnected...



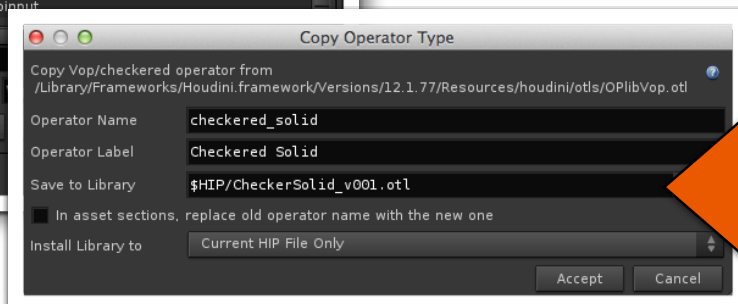
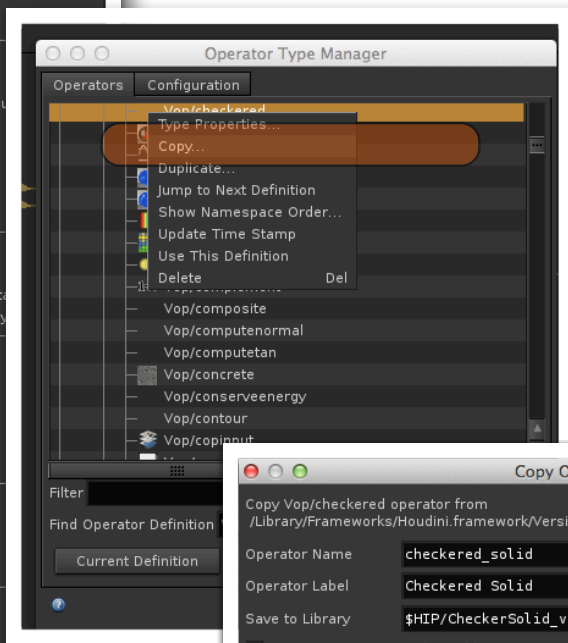
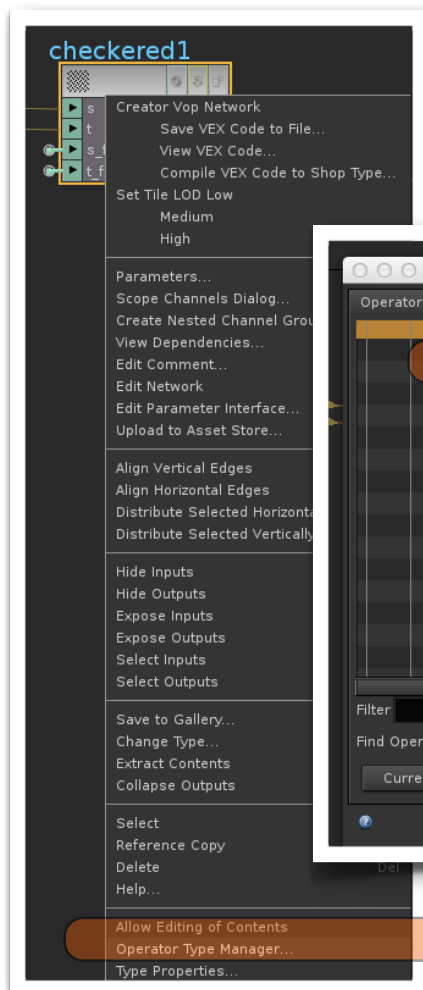
So what does the network do?



- ▶ Test if there s and t values to apply a pulse train to it
- ▶ Multiply s times s frequency to get total frequency at location in uv space
- ▶ Add an offset (0.5 by default) to get the checker to align on border
- ▶ Use the pulse train to switch between positive and negative values (square pattern generator) and anti-alias
- ▶ Use the t direction as the “bias” to swap between positive and negative values
- ▶ Values of 0-0.5 = 0
- ▶ Values of 0.5 - 1.0 = 1

Converting to 3D Pattern

- ▶ Duplicate the Checkered Digital Asset
 - ▶ Right Click Checkered SHOP
 - ▶ Left Click on Operator Type Manager
- ▶ In the Operator Type Manager
 - ▶ Select VOP/checkered if not already selected
 - ▶ Right Click and select “Copy...”
 - ▶ Rename Operator and Label to “checkered solid

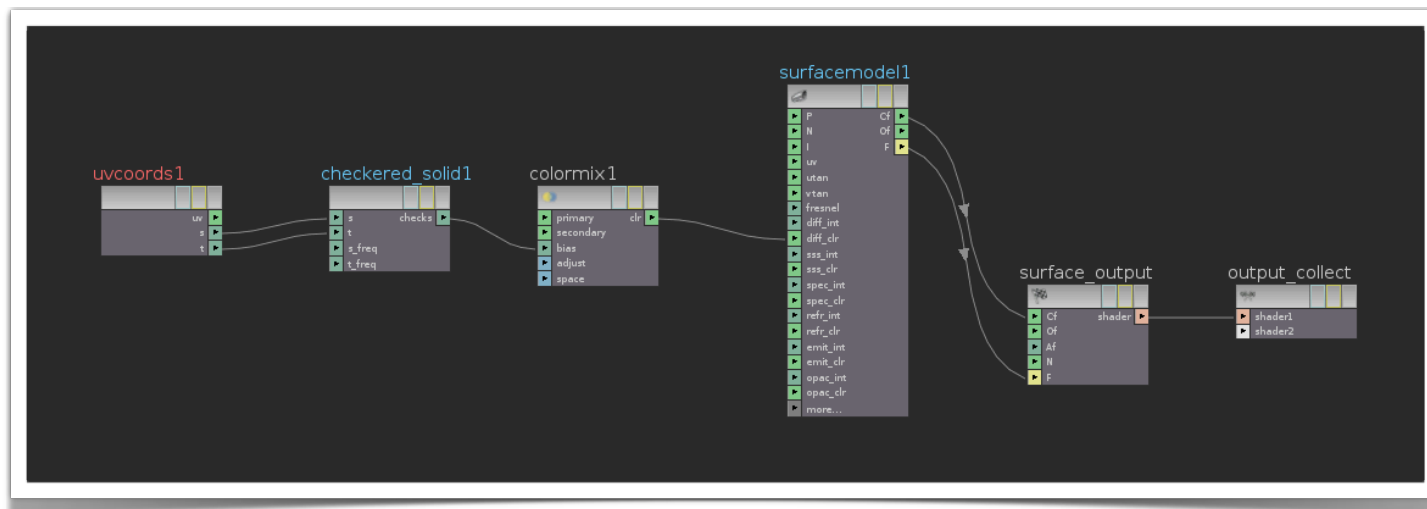


Save to project otl folder

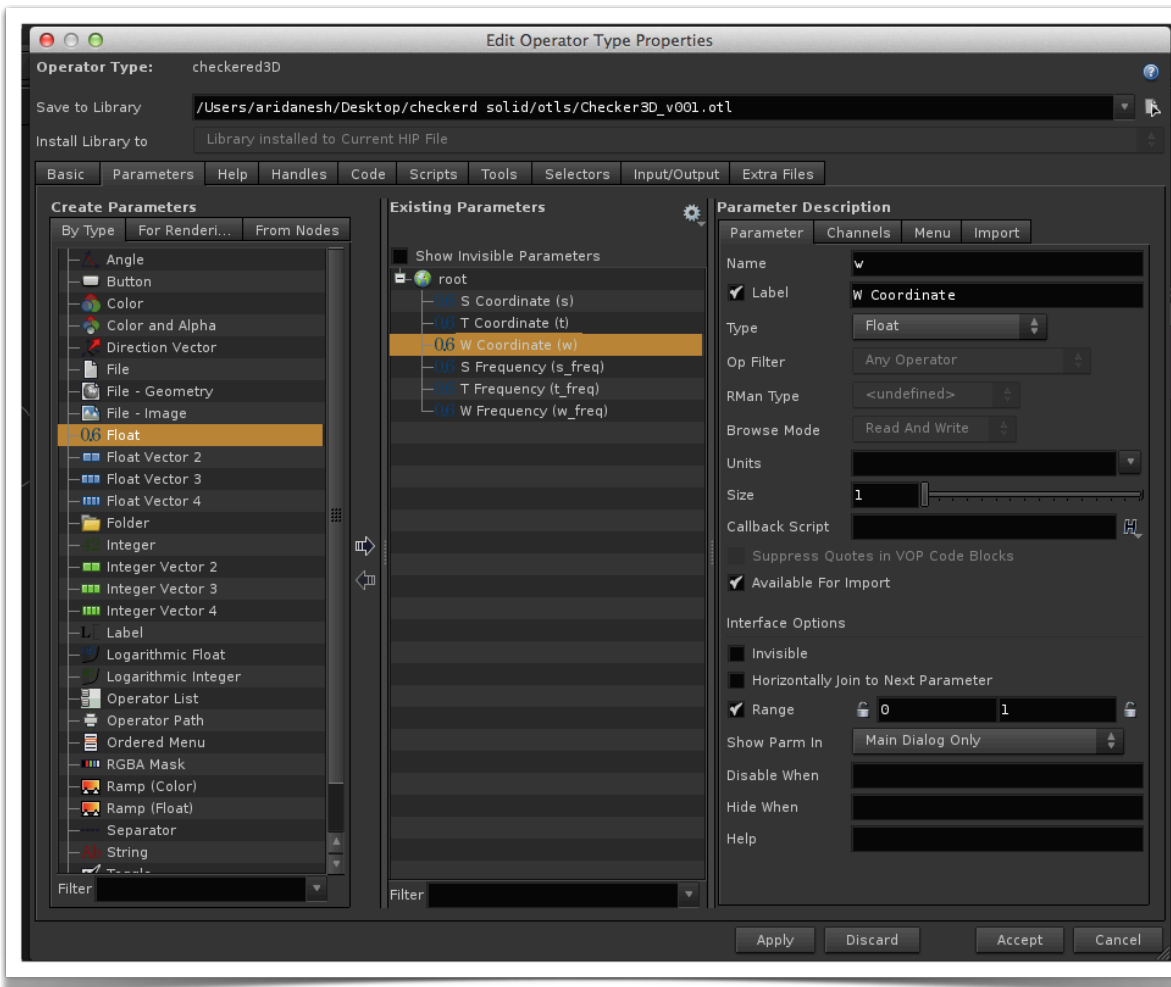
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Modifying the Checkered Solid

- Replace checkered with checkered solid in network
- Allow editing of HDA
 - Right Click node and select “allow editing”

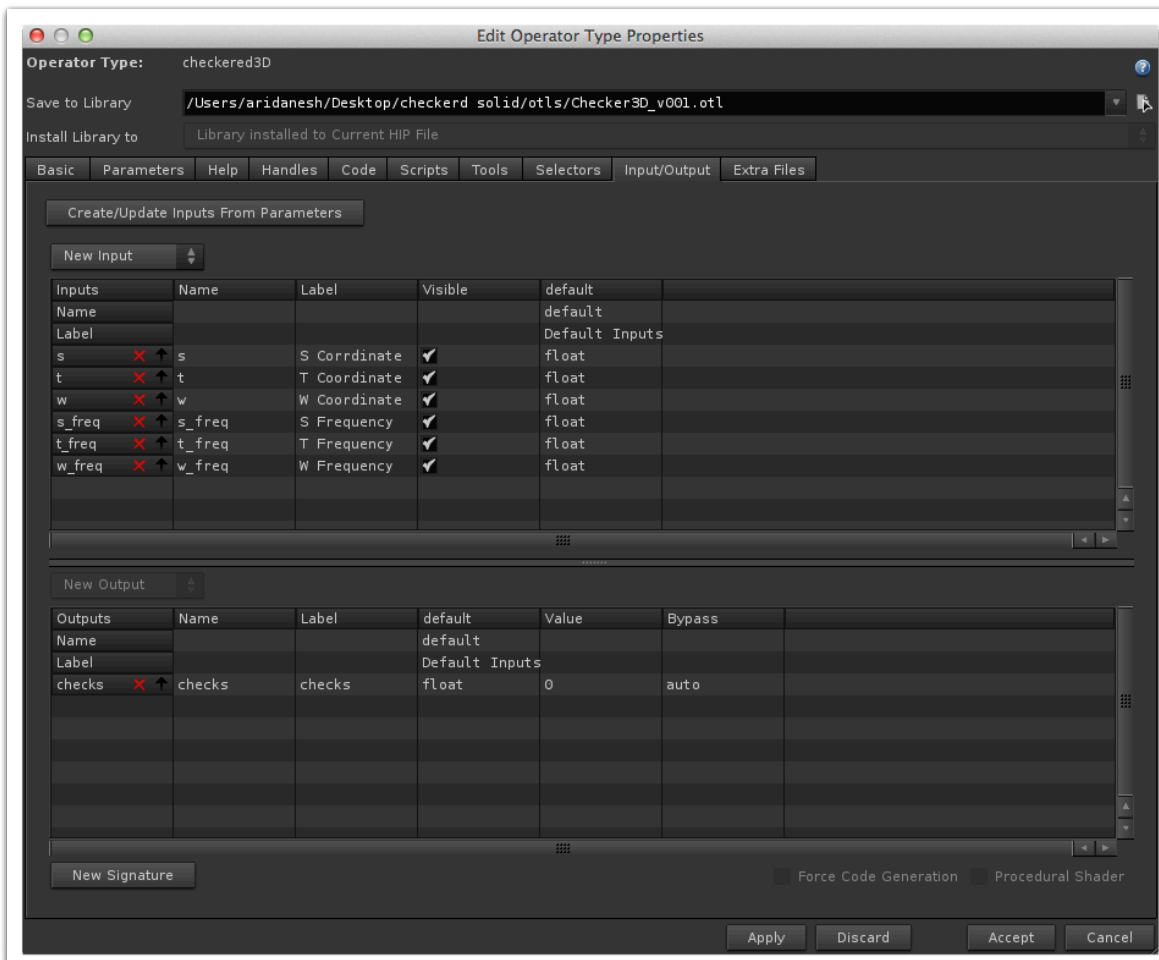


Adding W parameters



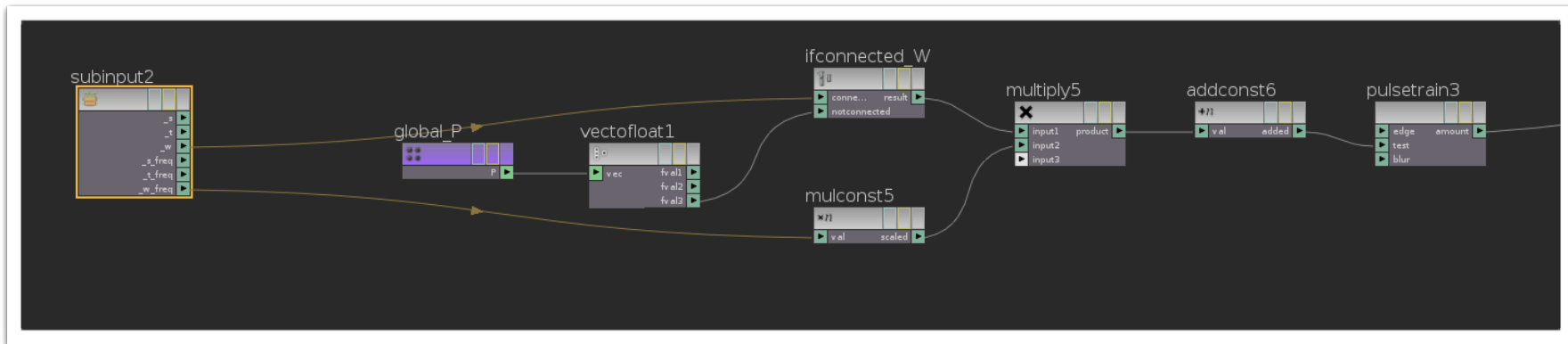
- ▶ Want to add w, and w frequency to the input parameters
- ▶ Open Type Properties
 - ▶ add float
 - ▶ Name - w
 - ▶ Label - W Coordinate
 - ▶ Range - Min 0, Max 1
 - ▶ Default Value - 0
 - ▶ add float
 - ▶ Name - w_frequency
 - ▶ Label - W Frequency
 - ▶ Default Value - 8

Adding Input/Output Values



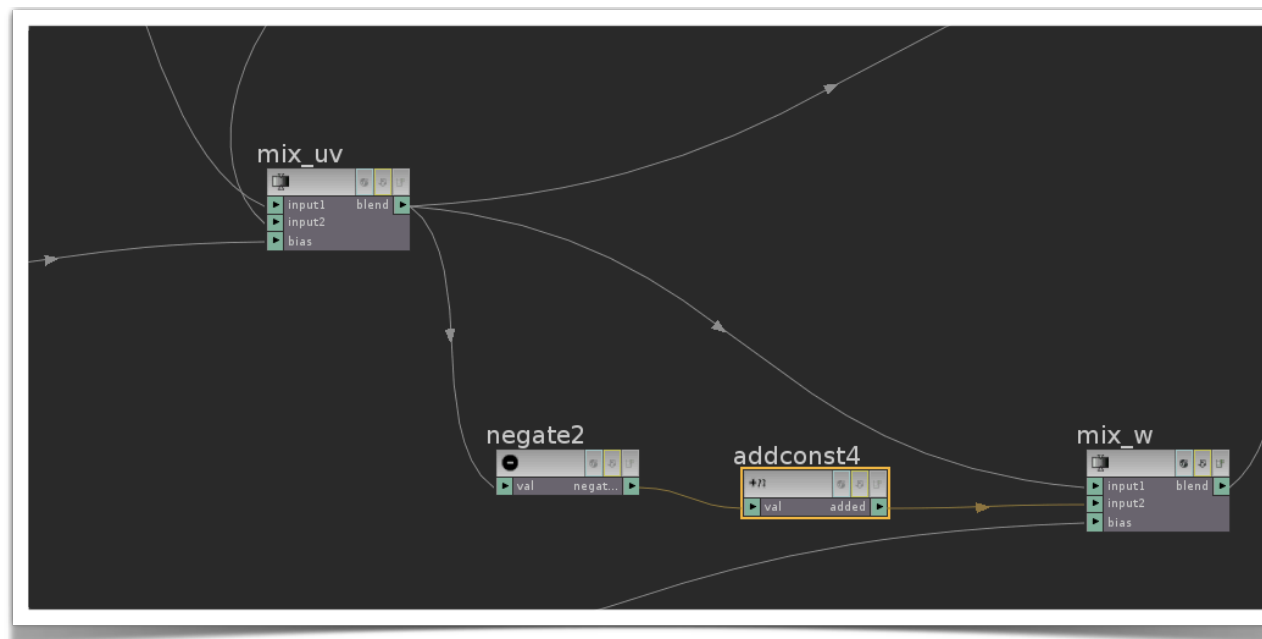
- ▶ After creating the parameters you must add the input/output values
- ▶ Click Accept

Creating the w coordinate network

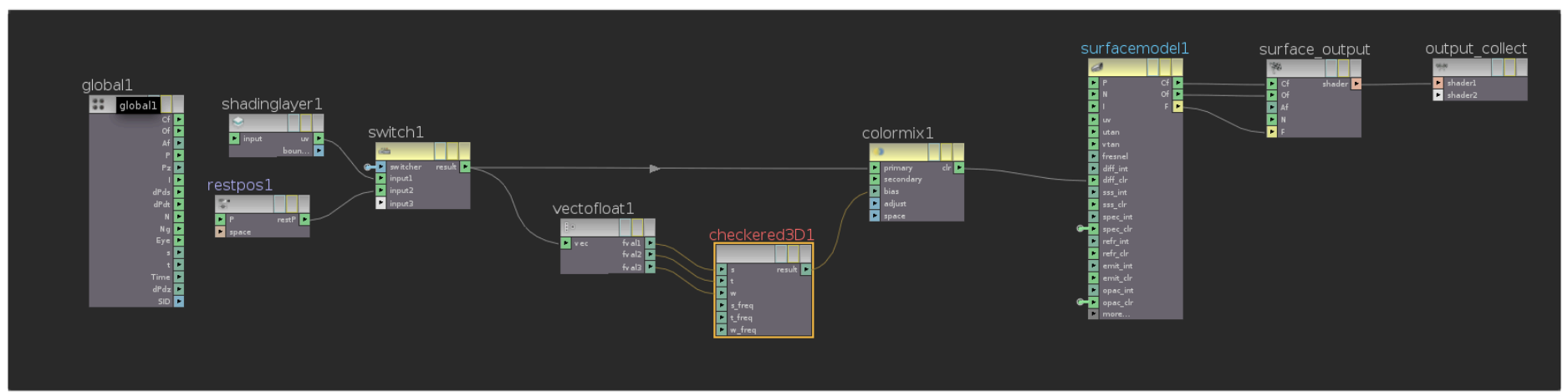


- Dive inside the Checker Solid Node
- Add the following network (we will connect it to the rest of the network later)
- All the mulconst and addconst have a value of 0.5

Adding the w coordinate Mixer

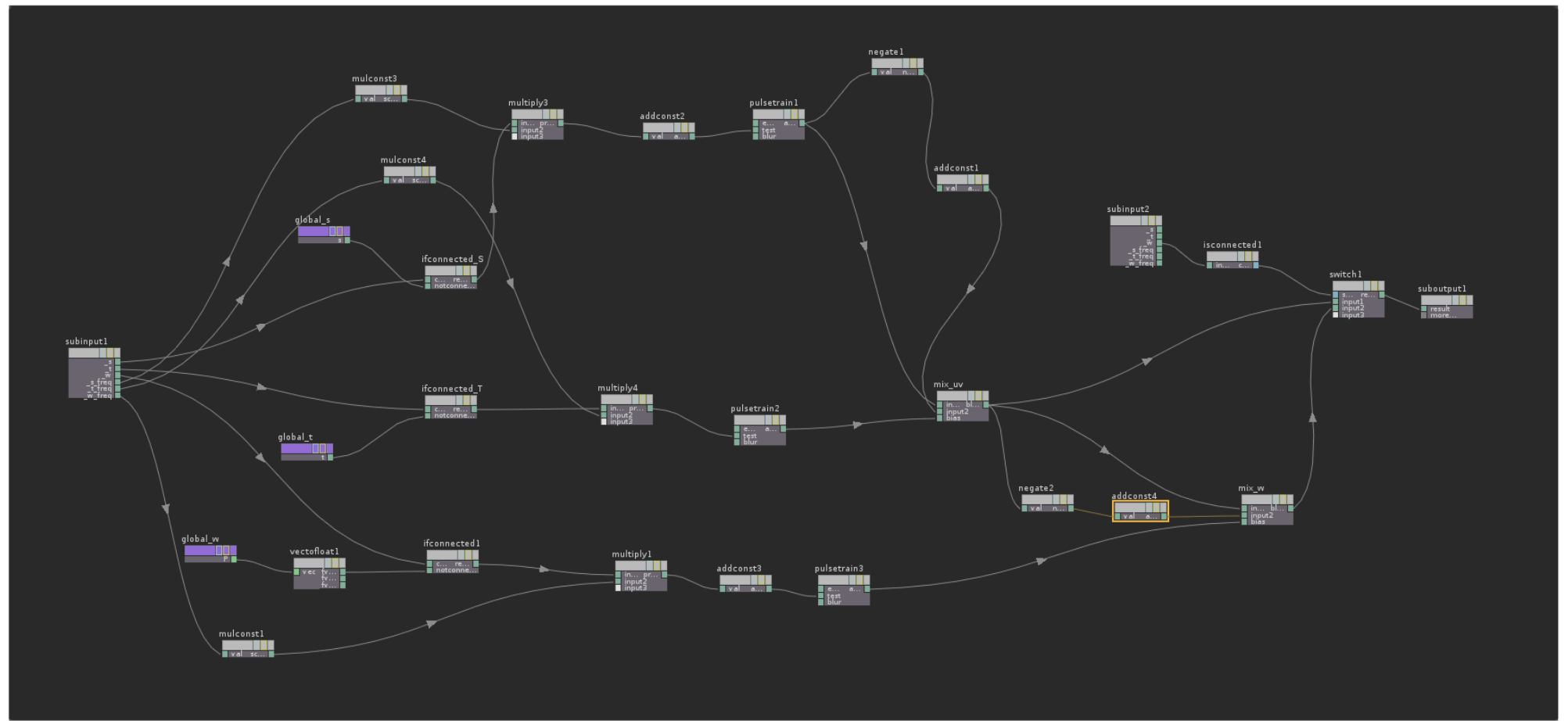


Using the VOP



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Putting it all together...



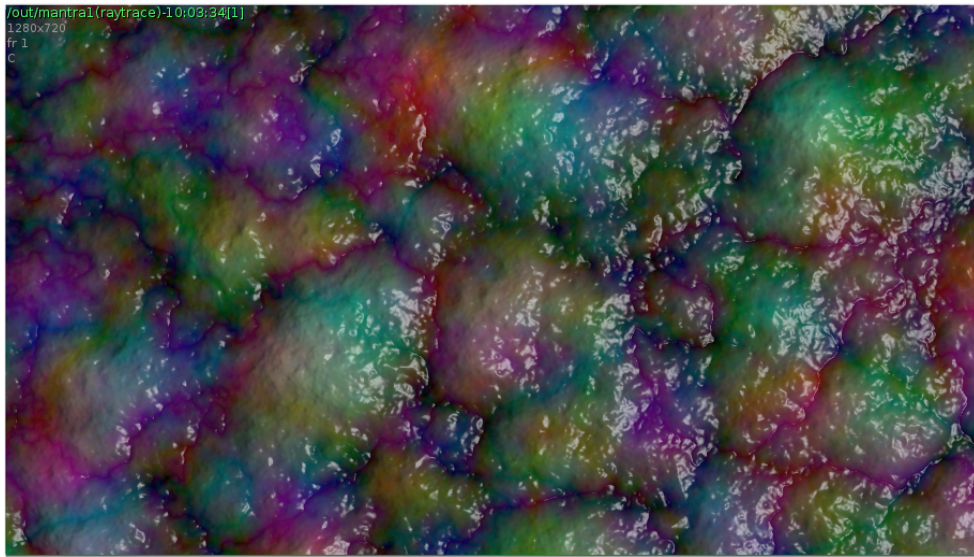
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Summing Noises - Some Halloween Slime

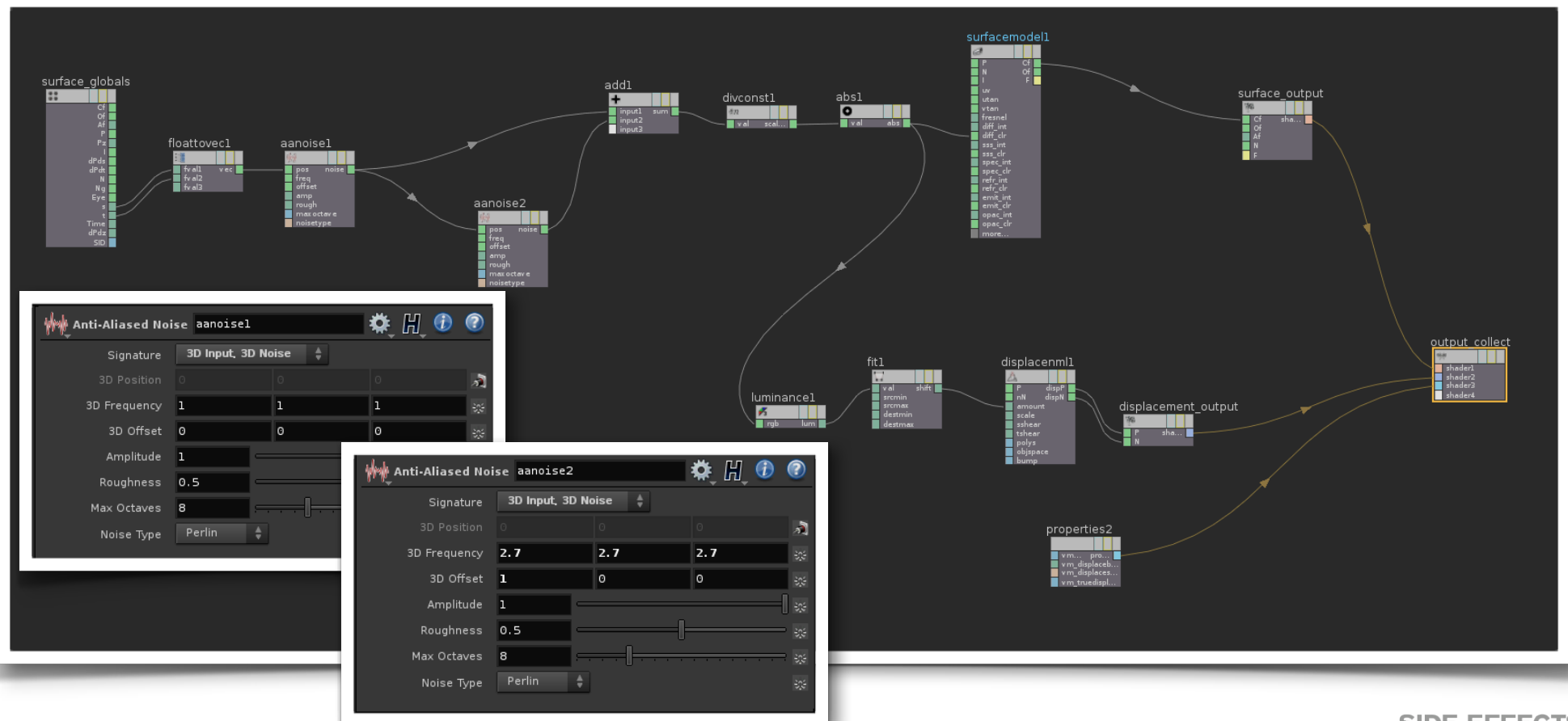
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Results we are looking for



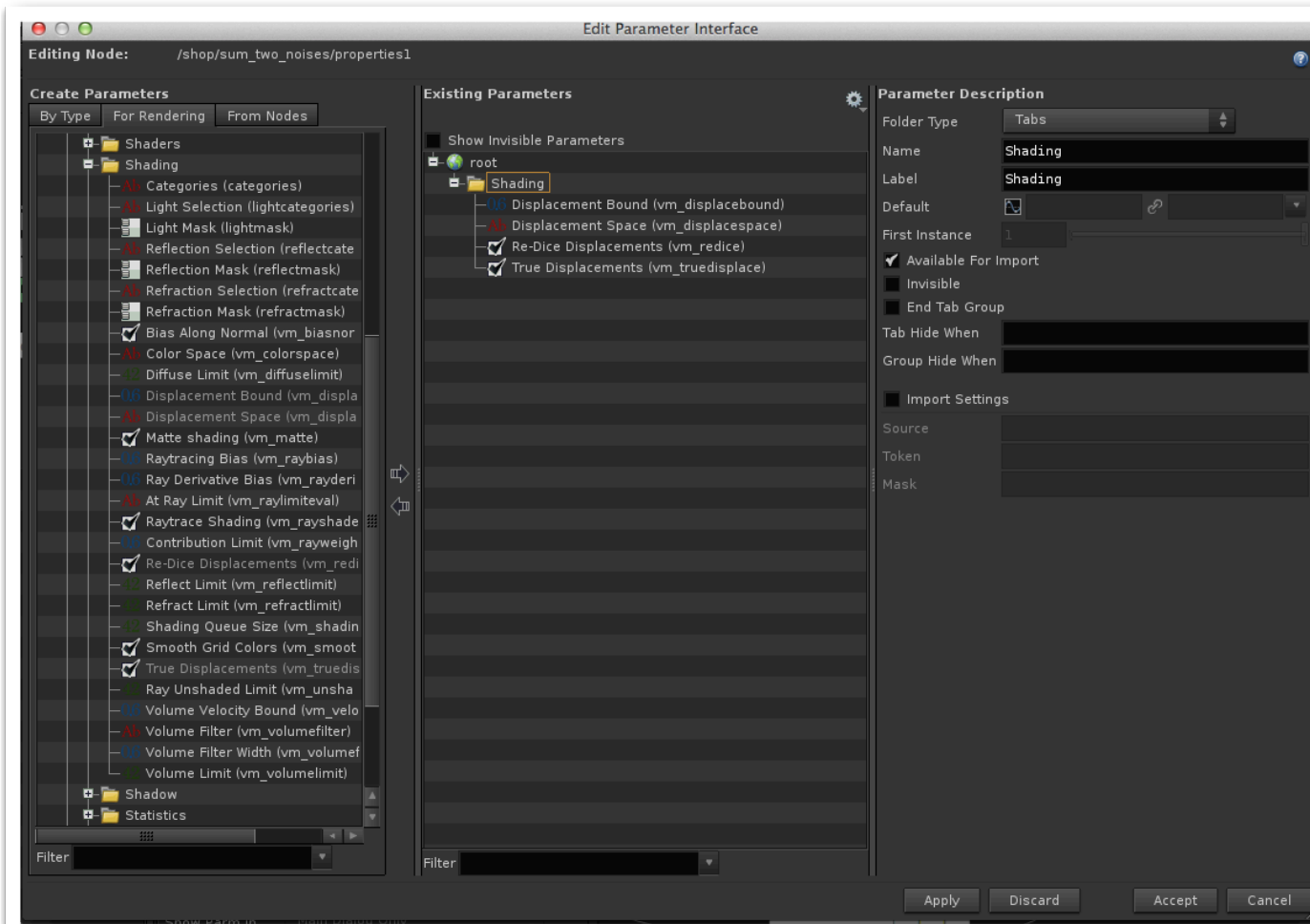
- ▶ Adding the same noise with different offsets or frequencies can give interesting results
- ▶ The same noise can generate the displacement

The Network



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Adding Shading Properties



- ▶ Need for dicing refinement
- ▶ Need for true Displacement

Parameters

