

# Feedback in Vuo

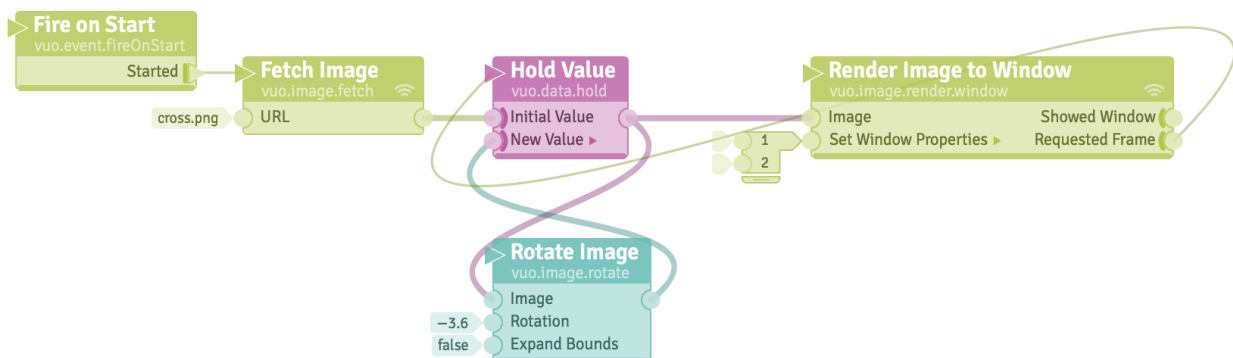
Feedback. The mind boggling never-ending trail you loved to look at as a kid in the electronics store when you pointed a camera on the TV that displayed the image (or at least I did). The howling sound of a distorted guitar in all of the 90s edgy and controversial rock-bands. The self-important survey of the marketing department. Ahh lovely (well, maybe apart from the last one). But what is it, and how can you use it?

Feedback is in essence a signal going back into itself and, for our purposes, amplifying the output by creating a distortion of the original signal. The great thing about Vuo is that the original signal can be any input. There are a few caveats though, especially when dealing with other inputs than images, that can very well break a composition. So disregarding the last line, how do we achieve this? Enter the **Hold** node.

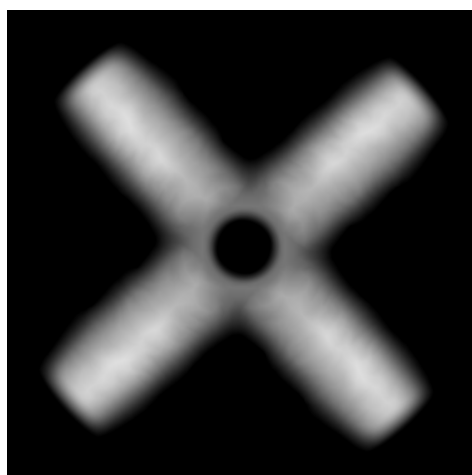


The brilliant thing about this node is that it can take its own output and apply it to the *New Value* input when triggered by an event. Just doing that of course will not achieve anything as it will only take the last value at the output and constantly send it again, effectively stopping the composition. To actually achieve interesting results, it is the processing of the output signal before feeding it back into the *New Value* port that makes it so useful.

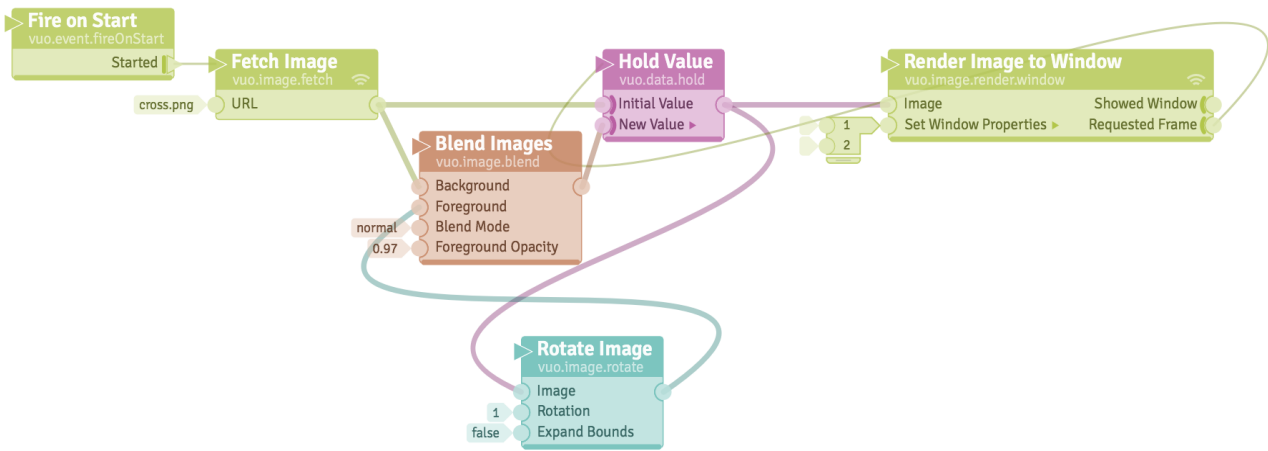
This composition for instance will be producing a continuously degrading (generational) and rotating cross:



Resulting image (rotating):



While it is the product of a feedback process, it isn't usually the end result we're looking for. To get a more traditional look, or feedback trails, we have to apply the feedback image to the original image. This is simple when dealing with images as you can just use the **Blend Images** node to achieve it like this:

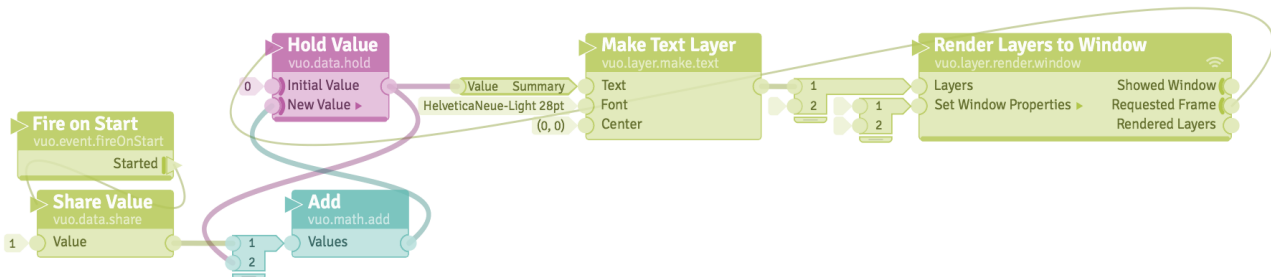


Resulting image (only the feedback is rotated):

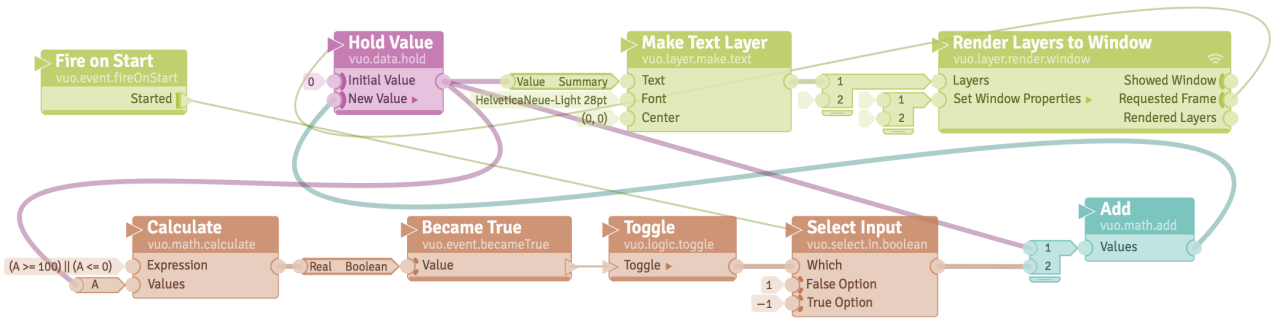


Rotating is of course just one of the applicable modifications, for different results, try resizing, moving, shifting color, changing the blending modes etc.

Moving on to other possible feedback scenarios we can take a counter as an example. This composition will add one (1) to the previous value for every frame, making it a frame counter.

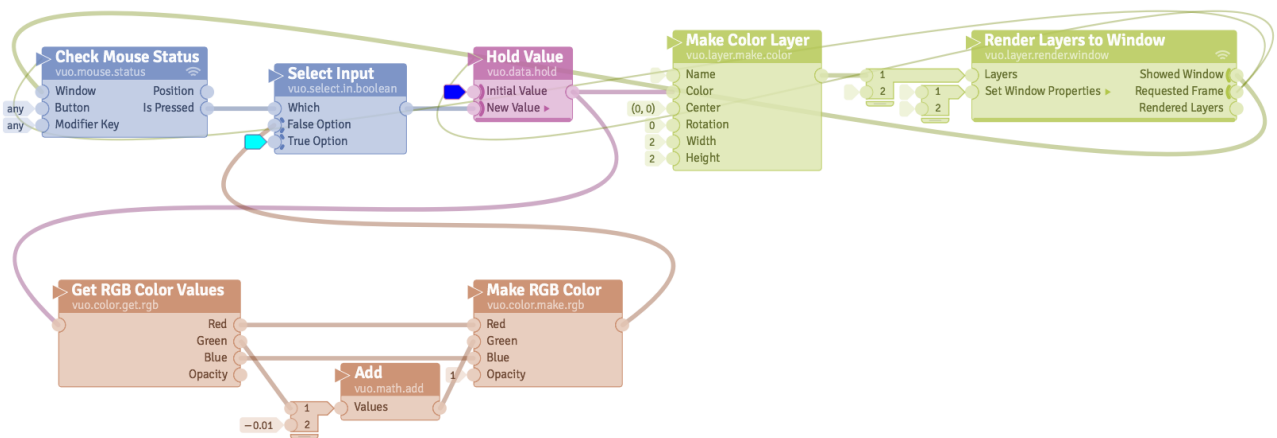


This can be triggered by a different event source as well, and made into a conditional counter effectively making an oscillator based on the nodes used with a small modification:



Condition used here is  $(A \geq 100) \parallel (A \leq 0)$  [A is larger than or equal to hundred OR A is smaller than or equal to zero].

Conditions can be used alongside other feedback scenarios as well, like in this composition where it is used to fade from cyan to blue when the mouse is pressed:



The **Add** node subtracts .01 for each frame from the green channel requiring 100 frames or  $\approx 1.5$  seconds to completely remove the green part. This can of course be used with conditions as well to start and stop it at arbitrary positions.

This is just scratching the surface when it comes to feedback options in Vuo, but it should give a starting point for further exploration. I've deliberately avoided feedback layers and objects. Although it is working, and you could get something out of it, it is very time consuming and unstable for the time being.