

Wavethresh 2.0 – Release Notes

If you have not used Wavethresh before you should read the user guide for version 1.0 before reading these notes.

Installation

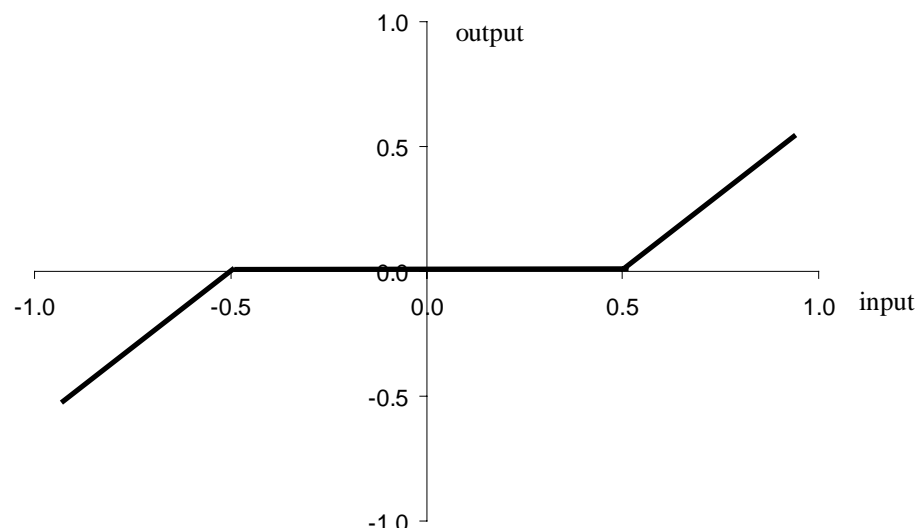
Simply copy the WaveThresh2.dll file into your VST plug-ins folder. You may want to keep a copy of the older Wavethresh.dll file somewhere on your hard drive for compatibility with existing work you have done using the older version. Do not keep Wavethresh.dll and Wavethresh2.dll in the same folder as they use the same plug-in ID and this may cause problems with your host program.

There are two versions of WaveThresh: WaveThresh2.dll and WaveThresh4096.dll. These are separate plug-ins that can exist in the same VST plug-ins folder together. WaveThresh2.dll uses an analysis/resynthesis frame size of 1024 samples whereas WaveThresh4096.dll uses a frame size of 4096. The latter will give better frequency resolution but poorer time resolution than WaveThresh2.dll. It is hoped that a future version of WaveThresh will offer the ability to change the frame size within the plug-in.

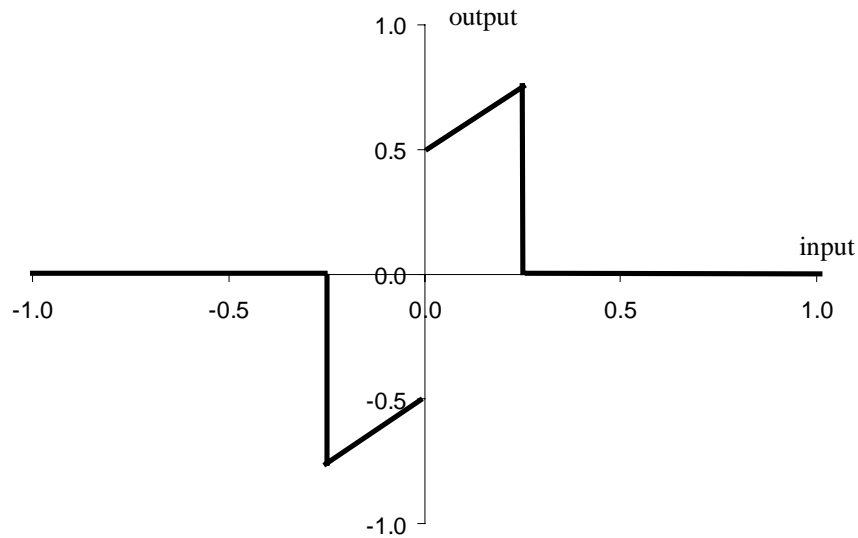
New Features

Combined Thresholding Method: There are now three thresholding methods – Fourier, Wavelet and Combined. Combined mode divides the signal into deterministic and stochastic components using a process called sinusoidal extraction. Fourier thresholding can then be applied to the deterministic part and wavelet thresholding to the stochastic part. The deterministic threshold control sets the coefficient level below which deterministic components will be thresholded, the stochastic threshold control sets the coefficient level below which stochastic components will be thresholded. This method is particularly useful for denoising signals whilst making audible artefacts less noticeable than with hard or soft thresholding.

Shift Thresholding: Hard and soft thresholding are explained fully in the previous Wavethresh user guide. Setting the 'Ratio' slider to the fully left position selects 'Shift Thresholding'. Shift thresholding is similar to hard thresholding in that coefficients above (or below) the threshold are set to 0 but in addition to this all other coefficients are reduced by the threshold. The input/output plot for coefficient values below illustrates shift thresholding with a threshold level of 0.5. Note that although the plot below is limited to values between ± 1.0 coefficients may have values outside of this range.



Reverse shift thresholding, which can be applied to coefficients to form the stochastic signal in Fourier and wavelet (but not Combined) thresholding is shown overleaf. All coefficient values are boosted by the threshold level but if any of the boosted coefficient values exceed the maximum coefficient value *before* thresholding then these coefficients are set to 0. For the plot overleaf the threshold is again set at 0.5 and in this analysis frame the maximum coefficient value before thresholding was 0.75.



Bug fixes and improvements

The coefficient control has been removed from *Wavethresh 2.0*. It may be added back in to a future version when a more intuitive way of controlling which coefficients are selected for thresholding is found.

The ‘Threshold Multiplier’ control now has a range of 0.0 to 10.0 (rather than 0.0 to 1.0) to offer more extreme thresholding. This control is now logarithmic rather than linear.

The Param1 and Param2 fader behaviour has now been standardised and both faders have an operating range of 1 – 10 (although this full range may not be available for different types of thresholding method or wavelet).

A bug in the soft thresholding algorithm which caused all coefficients to be dramatically boosted has now been fixed.

The plug-in now uses significantly less memory and is generally more stable.

Known problems

There is a bug in some hosts (*Logic Audio* for example) where parameter values are not updated unless the fader is moved. For example if the ‘Threshold Multiplier’ is adjusted the ‘Deterministic Threshold’ and ‘Stochastic Threshold’ values displayed do not update even though the actual values in the algorithm have changed. A workaround is to set the ‘Threshold Multiplier’ before setting either of the threshold values.