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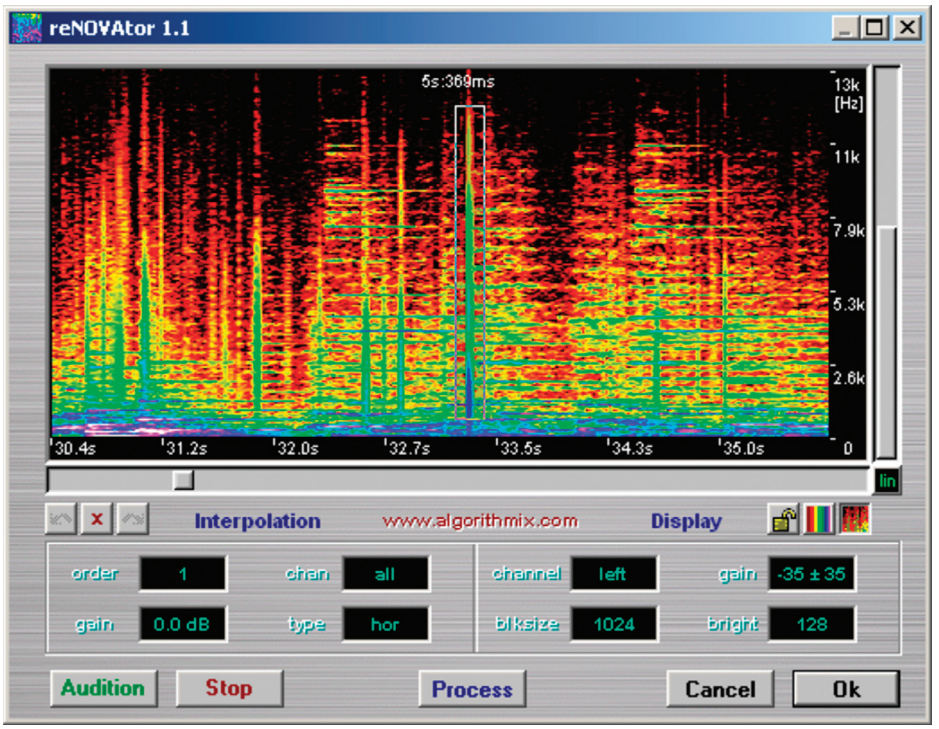
Post

Algorithmix reNOVAtor

By Alan Silverman

Algorithmix is a German audio company that has provided high-end digital design for various audio equipment manufacturers and under-the-hood DSP code for some of the world's best plug-in and workstation vendors. A few years ago, under their own name, the company launched Sound Laundry, an inexpensive suite of quality audio restoration tools. Now, with the release of reNOVAtor, Algorithmix has moved to the head of the pack in high-resolution audio repair and restoration with a product that is nothing short of amazing.

ReNOVAtor can remove extraneous sounds from a recording such as coughs, chair squeaks, hits, cell phones, car horns, plosives, lip-smacks, sibilance, performance noises, etc, and it does it with remarkable speed, precision and ease. After working with reNOVAtor for a short while you quickly take audio fixes for granted that were basically impossible until now. I am continually entertained by outbursts of surprise and enthusiasm on the part of other engineers when I demonstrate reNOVAtor to them for the first time. ReNOVAtor is tightly integrated into the workflow of the Sequoia and Pyramix workstations, but the company has just released a PC standalone version of the plug-in.



Features

ReNOVAtor begins by opening a new window containing a three-dimensional frequency-time-energy spectrogram derived from FFT analysis of the audio to be processed. Frequency and time are shown on the vertical and horizontal axes, and energy is shown by color. Unwanted artifacts are then identifiable by sight. The more distinct the problems are from the program, the easier they are to identify. For disturbances that are visually less than obvious, a variety of tools for refining the image and real-time playback allow considerable flexibility in separating the wheat from the chaff. Once a problem has been visually identified, the user draws a rectangle around it with the mouse, clicks the process button, and "poof" - problem gone.

ReNOVAtor applies intelligent interpolation that removes the unwanted sound and replaces it with new sound resynthesized from the region just before and after the selection rectangle. The surrounding material is analyzed statistically for transient nature, tempo, harmonics and noise to provide for a better musical match. The results can be immediately auditioned while still in the window via real-time playback control. Undos are allowed, as are multiple passes, and different sections of the window can be treated sequentially.

When the results are satisfactory, the user closes the window to find that the replacement material has been automatically edited back into the project with sample accuracy and multichannel phase coherency. Any unprocessed audio is left unchanged and because a new clip is created, the original audio is never lost. Of course, in many instances there is a lit-

tle more to do than that, but in most cases that's really all there is to it. The process works at all sample rates up to 384 kHz and is therefore well suited for SACD and DVD-A production.

Beneath the spectrogram are two control sections – one for the interpolator and one for the display. The display color range, brightness and resonance are adjustable along with independent horizontal and vertical zooms. Both a logarithmic and a linear view are available for the frequency axis. The channel view can be set to left, right or left+right or, in the Pyramix version, the display can be toggled across a multitrack group. (Multiple tracks can also be processed in Sequoia, but the display is limited to whichever pair is last selected.) When performing processing on multitrack groups there is no phase shift introduced between tracks. The most significant display parameter is the FFT block size, ranging from 32 to 8192. The smaller the block size, the higher the time resolution, so smaller values are best for tics and clicks. Conversely, longer block sizes increase resolution at low frequencies and are best suited for treating bumps, thumps, plosives and rumbles. All or part of the audio in the window can be played at will, including processed and unprocessed sections. This feature along with undo makes reNOVAtor especially easy to work with.

The interpolator can be tweaked in a variety of ways. Overall accuracy is set with the "order" parameter with a corresponding tradeoff in processing time. Even set at its lowest (fastest) value the audio quality of the interpolation is excellent at all frequencies. The channels to be processed are selectable as well as the type of interpolation to be applied. The interpolation types offered are horizontal (time) and vertical (frequency) plus variations which can force the direction of the interpolation if need be. There is also a 2-dim type that is specifically for very short artifacts and, unique to reNOVAtor, a very effective "gain selective" type. Gain selective interpolation allows the process to affect the selected material only in an adjustable amplitude range and leads to some very intriguing applications.

In Use

My first application of reNOVAtor came during the mastering of a jazz violin and piano duet. The violinist had played a near perfect solo except for an annoying bow scrape during a long sustained note. She asked if anything could be done. My first thought was to say no and move on, but I had just received a license for the plug and somewhat hesitatingly decided to give it a try. I had only skimmed through the quick start tutorial and I did not want to fumble around in front of a client. In spite of my lack of experience, I found the process to be fast, intuitive and user friendly. The dissonant harmonics were visible in the spectrogram without any adjustment of the default window other than the vertical zoom. I drew the rectangle, clicked process, and auditioned the results. The scrape was gone, the proper note remained, and the only extraneous sound was that of our jaws dropping. This was impossible. I only had to raise the level of the replacement audio a bit to match.

The next trial occurred during a country mastering session. In this case, a fine acoustic guitar solo was practically ruined with a fretboard squeak that smacked you hard in the forehead. Ordinarily something like that is an organic part of a performance and you leave it and love it, but this one was over the top. A minute later it was as though it never happened. I have since found that going to reNOVAtor is the fastest and cleanest way to deal with plosives, lip smacks, and studio clinks and clanks.

Coughs picked up during live performance recordings are a lot more difficult to deal with, especially when they are splashed in reverb or natural ambience. In dealing with these I find that multiple passes are generally required, working first on the highs, then the lows, and then the reverb tail to get the best results. Display adjustments are essential to finding the right areas to work on and a fair amount of trial and error is required. Because reNOVAtor allows you to audition and undo each step while in the window, the time there is spent very efficiently. A little of the cough usually remains at the end of the treatment, but moved from front row center to the balcony.

I do a fair amount of work on material that originates on optical sound tracks and 78 rpm transcriptions and find the Algorithmix process very well suited to dealing with rocks, pops, snaps and sibilant distortion. In the latter case, the plug's gain selection mode is essential because some sibilance needs to be retained.

A few of us who are reNOVAtor users have taken to calling each other at odd hours to brag. After all, who else can you talk to about this stuff? I received a call from my friend Graemme Browne of Zen Mastering in Vancouver that wins the prize. Graemme was mastering the final 5.1 live surround mix of a nine-voice women's choir in which one of the sopranos kept jumping out on specific notes. Working in Pyramix, and applying reNOVAtor's gain-section mode, he was able to rebalance each occurrence of the obtrusive note simultaneously in all five of the main channels by lowering its level and sweetening its sound by reducing some of its harmonics. Now, that is a Zen Master.

Summary

Algorithmix makes me a genius. ReNOVAtor continues to surprise and delight. Each time I've put it up against a problem that until now would have required considerable time to achieve only modest improvement, it has made short work of the situation with perfect or near perfect results. New applications are continually presenting themselves. I cannot see how reNOVAtor is anything less than an essential tool for the audio professional dealing with the kinds of major disturbances routinely found in finishing sound for film, television and records. Disturbances that would mar a beautiful performance or an otherwise perfect recording become ancient history.

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Fast Facts

Applications:
Post production, studio
High-resolution audio repair and restoration

Key Features:
Noise analysis and removal; frequency-time-energy spectrograms; up to 384 kHz sample rate; multiple undo

Price:
$2,490, €2,490

Contact:
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