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Sonic Systems Project

Shaped Vocoder

The vocoder is a symbol of our electric future. It is a system based on expectation, on the assumption that we can fit sound into a pre-shaped constricting mold and regenerate it upon transport to another location or time. We expect that our sounds will have a given profile of representation in frequency, we define our systems based on that profile, and we delight ourselves with the minimized dimensionality of the output.

The vocoded voice presents as a robotic and quintessentially electronic one, a distilled essence of humanity. It seems to be the interface a much more complex and powerful entity might have with our aural cognition. Frequencies input to a vocoder are compressed: the loss is of character not content. The faceless sound of the machine, its voiceless voice, can be thought of as private, as intentionally distant. Knowing that our perceptive capabilities discern a spectrum of frequencies, the machine seems to deliberately frustrate our empathy. It presents as a pressurized speech, an unnatural expression that seems to come not from the human controller of the system, but from the universe as a whole.

But the vocoder is a crisply colored window between us and its input; we can discern a great deal of (mechanized) underlying structure. What if we were to not only constrict the bandwidth of the sound into channels, but then distort those channels through time, according to an envelope, perhaps separate for each channel. With this system we can smear sounds through time. In a sense, we allow a release for the pressure incurred under compression into predefined frequency bands.

The shaped vocoder project is an attempt to create a shaped vocoder, which affects the levels of output frequencies based on a decay function of its frequency decomposed input rather than a running immediate measurement of their levels. The intent is to give a modified echo to the sound, or to find a systematic way of blurring the sound through time. The system will be a parametric filter, but its interactivity is incidental. It is primarily

intended as a method of distorted listening & playback.

There are two ways to use a vocoder: on speech, or on sounds that are not speech. The vocoder was initially designed, of course, to encode speech into a less dense spectrum that could be compressed for easy electronic transport. Its emergence in popular music follows the realization of human mechanization and social reliance on inflexible machinery. It is a limited surrender to the machine, trading the character of a voice for the possibility of its endless reproduction in the electronic landscape. Its early use in the music of Wendy Carlos and Kraftwerk consider the surrender with some apprehension, but the adoption into popular culture was more hasty. The vocoder is supplanted today by the tool of perfection, Autotune. Instead of compressing our character into a preset form, we simply move it to where it needs to be: the machines have become our servants, and surprisingly we have convinced them to keep us in tune rather than in line.

But they cannot yet force us to think longitudinally. The desire for Long-Term thinking emerged almost concurrently with the informing of popular music by the vocoder: with Brian Eno we see an ambient counterpoint to the mechanization of the vocoded masses. If we focus on eternity, we can see structures existing more obviously in time: punctuation fades, sentences emerge. What we need is a way of shaping sound into a timeframe that contains it. The vocoder gives too much, allows us to see the outline of the sound. Blurring it beyond that, we find pure color. Alvin Lucier achieved this effect with space and repetition. Similar rich long sounds are commonplace in current electronic music.

To create the effect, the system is in essence a many-band vocoder: 50-100 bands are a good start. Without any modification, such a filter would ideally have little perceptible effect. The key modification is to trigger a given envelope for each frequency from each sampled incoming signal amplitude. This provides a great deal of flexibility in terms of the effects rendered: by using different envelopes for each frequencies, we can shift frequencies through time, as if some were travelling further than others. We can blur a given frequency through time in order to make it indistinct and more of a color wash than a punctuating sound.

These effects could be achieved previously through graphical frequency domain manipulation, but critically they would not be real-time. The ability to use such a filter in real time presents the possibility of truly interpreting the world through such a lens, not only rendering and presenting an image but providing a virtual reality: one where nothing is distinct.

The most frustrating aspect of the device is its interface: there are too many variables. While the system can be used to interpret the world in real time, it can hardly be used to make fast changes in real time. Short of having a number of presets, there are few clear ways to modify so many parameters at once. Perhaps the interface is only trying to tell us that if we wish to listen to the world from such a temporal distance, we must be willing to do so deliberately and with extreme patience.

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