nu harmonics: draft of goals

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I think now, after brainstorming and poking at the **nu harmonics** project for about three months, is the appropriate time to write down a more concrete project description than "make something that makes sound". Today I came up with a working API for the transform package, and I realized what I'm trying to make is a non-deterministic sound environment. Certainly the technical aspects of transforms, DSP, and real-time controls are interesting to me, but I think the more interesting and influential aspect of this project is the way the layered ops will allow people to approach a signal from both sides of a transform: synthesizing what comes out by specifying the input; and synthesizing a system by specifying the output.

All of the sound-making environments I've used go the first way; however, as I consider more the way people who don't have that technical intuition of "this block does this effect", mixing the two approaches seems invaluable. For example,

I have a sample. I perform operations to get a cool *system* on the sample (e.g. some stretches, some empty space, some weird mathematical overtones). Now I want to smooth the edges of a section ... what do I do?

Well, I could graphically manipulate the transformed waveform and have that affect a mix-in signal; or I could try to define a smoothing filter (graphically) by hinting how I want the signal to end up. Both of these are valid approaches, but the first defines a one-time fix (which may just hit the spot on your sonic masterpiece) while the second defines a system. That is, while the first works great on your exact sample, with the second, I could feed an entirely new sample in and expect to hear the same cool effects.

The power of being on both sides of the transform is that you could use either approach, equally as easily!

I spent some time implementing various FFT algorithms and implementing a distributed framework for evaluation. The reason I feel this is so critical (to have fast DFTs and IDFTs) is that **nu harmonics** should always be able to link a spectral view to any signal, and manipulations to each should propagate both ways. You should be able to drag a window on the time view and see its spectrum. You should be able to operate on the spectrum as if it was a time signal (the same operations should apply).

So, in a nutshell, these goals are **nu harmonics**. I'm also working on MIDI integration and a general circuit for the connection of peripheral toys (will basically deal with streams of samples, where each stream can control some aspect of the system).

Even though this document is brief, I intend for it to mark the beginning of a more focused pursuit of these goals.

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