

http://www.richarddudas.com/private/amay/dudas_prelude_and_fantasy_wocmat2012.m
[p4](#)

I-ju Chen, flute

Actually, some of the opening material and ideas in the slow section were originally based on ideas that I had sketched for Elizabeth for a piccolo and electronics piece... the idea was that the little short notes could be recorded and stretched a little and have their timbre modified, and they would sound like little bells. I wrote a special version of gizmo~ (called picc-gizmo~) which lets you retune the individual partials of a sound. It didn't work perfectly. You can hear this effect on the lower half of page 2. It is subtle, but the 3rd, 5th and some higher partials are monkeyed with (the 3rd partial is moved down to a low minor 3rd instead of the 5th, and the 5th partial is shoved up to a slightly low 4th). Although I was hoping for a clearer bell-like sound, the result was not so clear - at least it does give the timbre a nice "smoky" sound, which fortunately works well with the alto flute (though it might not have worked so well with the piccolo).

The 2 polychords that are used at the outset of the piece are a superimposed dominant 7th chords on E and Eb (...can you say "rite of spring"?! - although I'd like to think they are a little disguised...), although they are tuned from the harmonic series and thus have a 1/4 tone flat 7th, coming from the 7th partial of the overtone series (D quarter tone flat and Db quarter tone flat - sometimes appearing as C quarter tone sharp). The next one that happens at the bottom of p.1 uses half diminished chords, tuned to the UNDERtone series based on C and Db, still partials 4,5,6 and 7, like the dominant chords tuned to these partials from the overtone series. this means that the low notes of these 2 chords are an Eb that is a quarter tone sharp, and a D that is a quarter tone sharp. Why did I use these chords? It was not really to make a reference to the rite. I think originally I thought that I would record all the individual notes I might need for later in the piece and I wanted those notes to be able to morph into timbres when played together. Two interlocked 7th chords seemed a good start to begin filling in all the chromatic notes.... (and if their pitches relate to the harmonic series they could potentially blend together as a single timbre). However, I never got that far because I realized it would be much more fun, not to mention more useful in the long term, to just create a transposition mechanism built into my buffer playback system so I could transpose any given note to any other note...

Anyway the same 2 chords appear at the bottom of p.2 where they use the "bell timbre" instead of the harmonic spectrum.

Then on p. 3 (m 41 and 43), I do the same superimposed 7th chord thing thing with minor-major 7ths and minor-minor 7ths. Here the choice of which 2 chords was based on what sounded "right" and matched the other chords used previously in the piece, in terms of "crunchiness". Although I was trying to use several different 7th chords in the piece in this polychord context, I was not trying to be exhaustive. This is a piece of music, after all, not a catalog. I am generally rather adverse to fully diminished chords because they were so over-used by the end of the 19th century. I think we can all go several hundred years before we need to hear them again. So I had no intention of letting one get anywhere near this piece. On the other hand, I really love major-major 7 chords, but they seemed too saccharine here, even if I plunked two down together a half step apart. So they were left out of the game, too, unfortunately.

As for the opening notes and other places where these little staccato notes appear (incl. m 41+43) - the order of appearance of these notes in ALL four places changed a couple of times because some intervals confused the pitch tracker.... I eventually figured out it was an inharmonic partial in the alto flute spectrum - a sharp octave - that was causing the tracker to jump ahead when it was expecting intervals of minor 9ths (and maybe some others). In addition to messing around with the notes and leaving them in the new order for security (instead of putting them back the way they originally were when I figured out what the problem was), I also ended up greatly reducing the number of partials antescofo looks at - this solved quite a few problems, overall.... Most of the note changes were rather inconsequential, but I think m 41 and 43 suffered, because they ended up looking rather too similar in melodic profile, whereas in the original version they were different - on purpose, for creative-musical reasons. Thus, they got a little bit "dumbed down" in the process of making the computer part of the piece actually work properly.

Additionally, measures 41 and 43 were originally supposed to be lip pizz, in order to provide a different timbre possibility for the sample playback. Some of the higher notes sounded down an octave - that was a miscalculation on my part - but more frustratingly, the noisy attack timbre of the lip pizz wreaked havoc with the score following so I eventually relented and just made them staccato, like the ones at the beginning.... sigh...

On the subject of adding notes to keep the pitch tracker and score follower happy.... I thought I had learned my lesson in the clarinet and electronic piece where I had to add a lot of extra "out of key" notes to keep the pitch tracker from jumping ahead. I had some problems with that here.... so I was forced to add some "extra" notes - such as the last note at the end of m 3, and the analogous place in m 11, the 2 notes before measure 32 and the 8th notes at the end of meas 32 and 33, and the 2 notes at the end of m 40. They are now all part of the piece for me, but they were certainly slightly jarring afterthoughts at the time....

One thing that I never implemented was a volume tracker for the flute, so the volume of the electronics could be influenced by the live performer. This indication is still in the score in meas 33-36, but I just end up riding these volumes by hand at the mixer at this point..... One day maybe I will refine the patch a little to make it do what it says it does!

When I had been playing with early versions of antescofo I had realized how quick it is at tracking and reacting, compared to pt~ and fiddle~. So, the whole idea of this piece was to use antescofo to create tight interaction within a perpetuum mobile fantasy... Also, I like quintuplets. I think they are great, especially for finales, and so few pieces are written in 10/8, 15/8, 10/16 or 15/16 time. I guess the big example is the Ravel quartet. Anyway, I have used this kind of quintuplet rhythmic idea this several times in the finales of my pieces - from the final toccata in my harpsichord suite to an unfinished gigue for cello and piano, and I wanted my perpetuum mobile to also use this incessant quintuplet rhythm. Much to the chagrin of players, I think, the piece LOOKS like it has patterns, but in fact measures that seem to be repeated are actually always slightly different - just compare the first 3 measures in the fantasy and you will see what I mean. This was done partially for musical reasons (contemporary music isn't supposed to have repeats, is it?!! ;)) and partially to keep the pitch tracker and score follower in the right place and not jump ahead!! And it works admirably, but it makes for a lot of extra practice for the player!!

What I do to get the note to fall in the right place when the flautist has a rest, is this is something like this: First, let's assume the rest that will be filled is on the downbeat. The important notes are the first 4 notes of the preceding quintuplet and the last 2 of the one before that, I think. First, I measure the distance in milliseconds between each of these notes as they come in. When the 4th note of that last quintuplet in the measure comes in, I sort the notes, throw out the highest and lowest values and average the remaining ones. This value is then used to time the placement of the downbeat. let's say it is 100 ms, the downbeat from this point is 200 ms MINUS the 26 or so milliseconds it has taken to recognize the 4th note, MINUS the approx. 33 ms delay from the beginning of the buffer to the peak of the attack, MINUS the I/O latency of the FFT-based transposer, which might be something like 46 ms, maybe. So the sampled note will be scheduled to be played back in 95 ms (200-105). (I think I may even subtract the I/O latency of the audio system itself, come to think of it...) Anyway, it works like a charm!

The algorithmic sequence on the last page - it was originally prototyped out playing back MIDI notes, and I think it sounded rather good. I had managed to get each of the voices sounding independent from one another and slowly converging to one. Unfortunately, it sounds rather less impressive played with my sampled flute sounds. I think it is the main lame point in the piece for me which I should really take some time to improve before the piece is played again. I think it needs quite a bit of additional work, both in the algorithm for note selection as well as improving the details of note playback, such as accenting the first note of each beat a little. Also, my flute sample playback mechanism certainly could stand some improvement, such as greater dynamic control of the notes and the ability to impose other envelopes on the sounds in real-time. It's all a bit flat as-is. Sadly this all takes time and I am on to other projects at the moment. Each time it gets performed I take some time to tweak it a little, so maybe one day it will be everything I had originally envisioned.

Last but not least, I do have to admit I would have liked to write a slightly longer fantasy (that was the plan), but ran out of time. As it is, I think it is a little imbalanced, formally speaking. But, anyway, looking back at it, I think I said all I had to say in the fantasy, so maybe it was the right time to draw that double bar, after all.

Originally, all the notes used as little interjections in the fantasy were supposed to come from the notes in the prelude which are sampled live in concert while the prelude is being played. In theory, this sounds nice, but in practice, this was a nightmare! The only time I ever dared actually run it "live" that way was at the 2011 ICMC in Huddersfield - more on that later. Basically, at the first performance in Seoul, I had realized that the score following for those short notes was less than reliable, so in the dress rehearsal we jumped to the points where sounds are recorded, recorded them, saved them, and I disabled the recording mechanism for the concert. For Huddersfield, I had monkeyed with the notes, figured out how to tweak antescofo a little, and made a little button thing where I could replace individual buffers (pre-recorded at the dress rehearsal) as necessary, in case there was a mishap.... Oh boy was there a mishap!!! In concert (but not in rehearsal, of course), the score follower jumped ahead like crazy and the buffers got filled with nonsense faster than I could say "another pint of bitters, please" (and certainly faster than I could click on all the buttons I needed to click on!!). I have an auto-normalize mechanism for the buffers, so the performance had a little visit from Jimi Hendrix at the bottom of p.1. I wish I would have recorded Helen's performance at the dress rehearsal - it was perfect!! The computer did everything it was supposed to do without needing me around. Since then, it has been played once or twice and I have always left the live sampling mechanism disabled for safety, and I think I have just continued to use the samples we recorded in Huddersfield, instead of taking the time to record personalized ones for the other performers. That kind of goes against the original "carte blanche" concept behind the piece, but at least it makes the music work. I thought it was only fair to sacrifice the concept a little, so the audience gets to hear the piece instead of a big mess. (Anyway, the technical and conceptual aspects of the piece are largely invisible to the listener.) I would like to try to get the live sampling thing working again sometime in the future, just to prove it can be done reliably.

One important idea behind the piece was the reintroduction of algorithmic composition ideas into an ostensibly audio-processing-based piece. In the 1980s when MIDI was all the rage there were a lot of interesting pieces made through the use of partial or total algorithmic composition playing MIDI-controlled synths. It had always seemed to me the computer music community had lost interest in algorithmic composition once computers got fast enough to do real-time sound processing in the 1990s. One of my goals was to add back some computer decision making into this piece. My former 2 pieces for MSP and solo wind instrument were rather deterministic, although I used some rudimentary algorithmic composition in my clarinet prelude in order to adjust pitches of individual notes in melodic lines being played back in canon. So, in this piece, I wanted to experiment some more with algorithmic sequences, and apply them to real-time audio processing instead of MIDI. There ended up really just being the one big algorithmic moment in the fantasy, although some of the "tolling bell" things on the second page of the prelude use some controlled random to generate slightly different bell timbres, and the choice of which sample to use throughout the piece is often made randomly within a given range of the recorded samples. What I did for the big algorithmic sequence section near the end is admittedly a bit rough, as I mentioned earlier, but I think this is a direction I'd like to pursue in the future - using a combination of algorithmic and performer-timbre-controlled signal processing - that is:

teaching the computer to make "human-like" decisions based on some volume, pitch or timbre factor (or all 3!) coming from the live performer.

I think that's it. I can't imagine having any more to say about that piece. I should write it up as a paper. I did write up some info on my clarinet prelude for a performance/paper at the ACMP in Tokyo:

http://www.richarddudas.com/pdfs/dudas_acmp2011.pdf

Some of what I say in that paper is also applicable to the alto flute piece - compositional process: the patch is somewhat of a "blank slate" when the performance starts, some signal processing techniques were experimented with beforehand in order to establish musical viability before starting composition, but then the piece was composed on paper first, just keeping in mind roughly what processing would be used and where, and then the patch was designed afterward to implement what I had indicated/imagined in the score.