CONCERT PRESENTATION: LES FRUITS DU HASARD

Daniel Courville

École des médias,
Université du Québec à Montréal,
Case Postale 8888, Succursale Centre-ville
Montréal (Québec), H3C 3P8, Canada
courville.daniel@uqam.ca

ABSTRACT

Les fruits du hasard is a musical project whose purpose is experimenting with randomness as controller for B-Format encoding of mono and stereo sources. The tools used for the random B-Format encoding are developed with SonicBirth, an audio programming application that encapsulates its programming into Audio Unit and VST plug-ins. The modular audio application Plogue Bidule is used for routing the audio signals and patching the SonicBirth-made plug-ins together. The musical elements used in *Les fruits du hasard* are transformed recordings of solo organ works.

1. DISCUSSION

Les fruits du hasard was born partly out of curiosity and partly out of necessity. It began in 2002 when I wanted to experiment with the University of York Ambisonic VST plug-ins [1], [2], [3]. Rather than using arbitrary tones and noises to test the B-Format encoders, processors, and decoders, I thought of using two solo organ works, variations on well-known Christian church melodies, that I recorded a year earlier for a CD release [4]. I felt that the variations provided good tonal material and that the somewhat repetitive nature of the compositions would lend itself to some form of deconstruction and various digital transformations. But the project was rapidly put on the back-burner because of the tedious process of programming the static and dynamic positioning of numerous sound objects. In 2009, the project was revived because of the development of my random positioning B-Format encoders [5]. The combination of the transformed variations and the use of random panners achieved the aesthetic I was looking for in 2002, but without the need to micro-manage every moment in the music spatialization. Randomness did not replace intent: on the contrary, it became a tool helping the expression of intent.

At the time of this writing, *Les fruits du hasard* is comprised of two compositions: *Choral and Variations on Vater unser im Himmelreich*, derived from a recording of Felix Mendelssohn *Organ Sonata No. 6*, and *Six versets sur le Veni Creator*, derived from a recording of *Cinq versets sur le Veni Creator* by contemporary French composer Jean-Pierre Leguay. For the 2001 original source recording, Patrick Wedd played both works on the Karl Wilhem organ of Christ Church Cathedral, Montreal. Both compositions of *Les fruits du hasard* exist in long and short versions, adapted to the listening context like sound installations or concerts. The following descriptions apply to the long versions used in sound installations.

The original *Vater unser im Himmelreich* melody dates back to the 16th century. In the form that Johann Sebastian Bach and Mendelssohn popularized, the melody can be divided into six phrases (Fig. 1). Using the Mendelssohn Sonata recording, each phrase, from the choral exposition and the following five variations, was isolated into an individual sound file, giving a total of 36 files. By using granular synthesis, all the audio files, whatever their original length, were stretched to five minutes. Following the stretching, and by reassembling the stretched phrases in their original sequences, the choral exposition and the variations had now a uniform length of 30 minutes. In this new form, the choral and variations are played juxtaposed, all at the same time: in the first five minutes, we hear the first phrase, but from all variations at once; in the following five minutes, we hear the second phrase from all variations, and so on.

While playing, this 12-channel (six stereo streams) sound file is sent to a processing section that presents various effects to each stream: equalizers, flangers, phasers, and pitch shifters are separately inserted in parallel branches and dynamically applied. Each effect branch is in fact made of two effects and a toggle switch that sends the audio stream in continuously random variable gain and rate to the two effects used in the branch. There's also a global routing network of random toggle switches that precedes the effects processing section, to ensure that, at each playback, individual streams will never be processed in the same manner. Silence is also sent through this routing network to augment the dynamic range of the piece, thus becoming part of the narrative.

Once the routing and processing applied, the audio streams are sent to a spatialization section comprised of 12 Ambisonic horizontal B-Format encoders. Here again, randomness is used as a control mechanism for the B-Format encoding: individual sounds move around totally independent of each other. Slow moving, fast moving, straight lines, curved trajectories, rotations, sounds gradually disappearing at the horizon, sounds suddenly appearing out of nowhere: all these are possible, but their occurrences can never be predicted. All in all, including the spatialization section, the routing network and the signal processing section, more than 90 random generators are used in this work.

Six versets sur le Veni Creator is constructed in the same manner as *Choral and Variations on Vater unser im Himmel-*
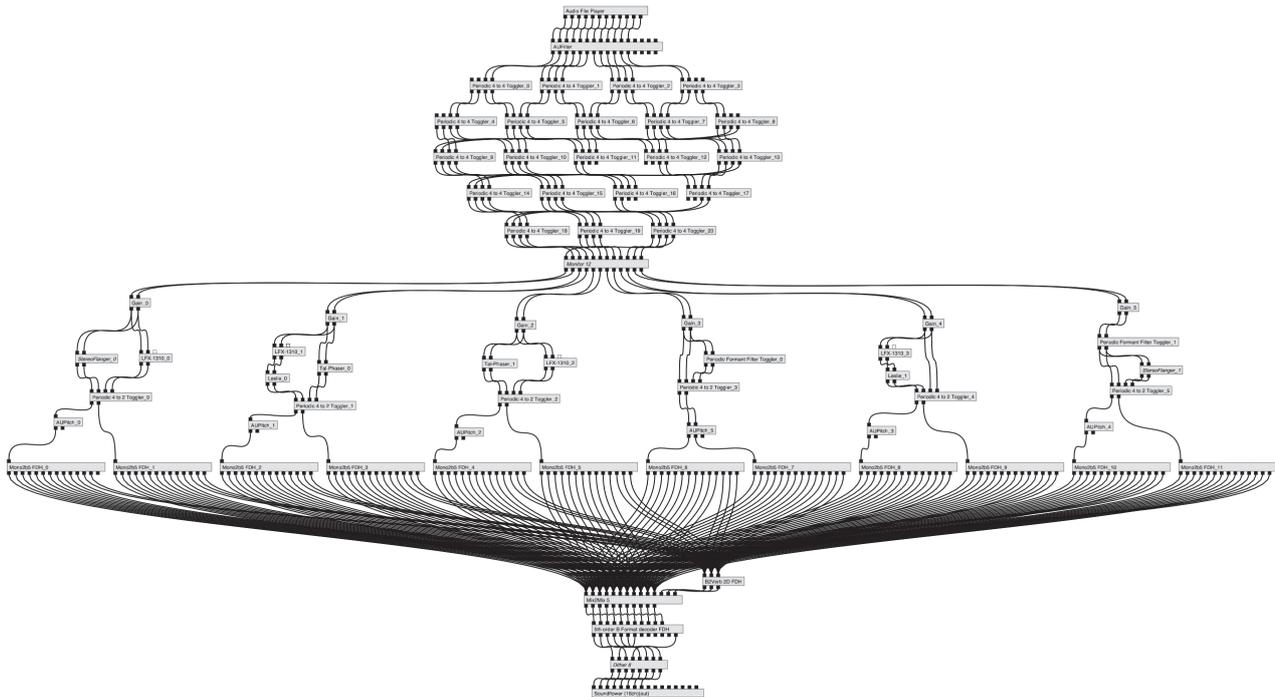
Figure 1: The *Vater unser im Himmelreich* melody, divided into six phrases.

Figure 2: The *Veni Creator Spiritus* melody, divided into four phrases.

Figure 3: The routing and processing network of the Audio Unit plug-ins for the fifth order version in Plogue Bidule.

reich, thus sharing a common and recognizable audio and musical signature. The Gregorian chant of *Veni Creator Spiritus* is divided into four phrases (Fig. 2). The same technique of isolating the four phrases in each *verset* (variation) of the Leguay composition, stretching the phrases to five minutes, reassembling the variations and playing them all at once is also done here. The multichannel file is sent to the routing network, then to the effects processing section and finally to the B-Format spatialization section.

Les fruits du hasard presently exists in three spatial resolution versions: a first order, a third order and a fifth order, all horizontal-only. Of course, the fifth order includes the first and third orders, but to save some CPU cycles (and heat generation!), the first or third order are used when the augmented spatial resolution of the fifth order is not necessary, like two-channel monitoring on speakers or headphones.

Audio file preparation was done with sound editor TwistedWave [6], granular synthesizer Audio Ease Thonk [7] and sound editor/mixer Steinberg Nuendo [8]. The Audio Units plug-ins used for live performance and responsible for random routing, processing and spatialization were built with Sonic-Birth [9]. The live performance is done in Plogue Bidule [10] where the multichannel file playback and processing all come together (Fig. 3). A MacBook Pro with Mac OS 10.6 is the current computer platform.

2. REFERENCES

[1] http://www.dmalham.freeserve.co.uk/vst_ambisonics. html

[2] http://www.york.ac.uk/inst/mustech/3d_audio/vst/ welcome.html

[3] http://www.york.ac.uk/inst/mustech/3d_audio/vst/vst3_ ambisonics.html

[4] Patrick Wedd, Peter Butler, *Thèmes et Variations*, Montréal, Canada: Madrigal, 2001.

[5] http://www.ambisonicstudio.com/b2x.html

[6] http://twistedwave.com

[7] http://www.audioease.com/Pages/Free/FreeMain.html

[8] http://www.steinberg.net/en/products/ audiopostproduction_product/nuendo4.html

[9] http://sonicbirth.sourceforge.net

[10] http://www.plogue.com