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Susan Gerofsky
218-2918 Slocan Street
Vancouver, BC, Canada. V5M 4S7
gerofsky.byrne@gmail.com, susan.gerofsky@ubc.ca
+1-604-842-7500

Who I am and how I composed my Bach 333 Fibonacci Canon

I am a professor of Mathematics Education and Environmental Education at the University of British Columbia in Vancouver, BC, Canada. I am also an active semi-professional musician, playing a variety of instruments (various squeezeboxes, baritone horn, trumpet, pennywhistle, piano) in several bands, including Orkestar Slivovica (Balkan/ trubaci), Tiddley Cove Morris Dancers (English Morris folk traditions), Sospiro Misterioso (European folk and dance traditions), Reed Isle (a reed classical/ folk trio including melodeon, clarinet and bagpipes) and others. I have composed several songs and instrumental compositions for these groups, and welcome the chance to try new sorts of composition.

I am also a regular contributor to the Bridges Math and Art conference, working with mathematics and dance, weaving, music and short film. I met Ulrich Seidel at Bridges 2017, and found out about the Bach 333 composition competition.

As you might expect, I used mathematical ideas to compose my canon. I started with the first 33 numbers in the Fibonacci sequence (since it is Bach's 333rd birthday), and translated them modulo 8 into the eight solfège notes of the scale (doh, re, mi, fa,…) plus a rest. The table of these notes is included below.

I chose a 9/8 metre as it is made up of three triplets (3X3), also in honour of Bach's special birthday.

The score is divided into eight sections, A – H, and is 33 bars long in total (a bit of a departure from the usual 32 bar composition, but 33s were important!) Each section plays with the original Fibonacci sequence in 9/8: the A section is the sequence straight up, and then subsequent sections reflect the sequence horizontally over time (i.e., playing the sequence backwards, from end to beginning), reflect the sequence vertically over pitch (i.e., within the major scale of doh, re, mi,…, the second pitch from the bottom becomes the second pitch from the top, etc.), transpose the notes from the treble clef positions to the bass clef positions, play the notes with triple the duration length, and layer all these transformations of the original Fibonacci sequence with a few harmony notes added for flavor. I also added a percussion line to help listeners hear the somewhat unfamiliar 9/8 downbeats.

The composition was recorded from the Musescore midi off a Bluetooth speaker onto a Røde recorder on an iPhone.

The process was a very interesting and inspiring one, and I intend to try it in different ways again to produce new compositions!

All the best,
Susan Gerofsky

First 33 Fibonacci numbers for Bach 333 Canon and mod 8 (+1), solfege

0	1	1	2	3	5	8	13	21	34	55	89	144	233	377
0	1	1	2	3	5	1	6	6	3	0	2	1	2	2
rest	doh	do h	re	m i	so h	do h	la	la	mi	rest	re	do h	re	re
610	987													
3	4													
mi	fa													

1597	2584	4181	6765	10946	17711	28657	46368	75025
6	1	6	6	3	0	2	1	2
la	doh	la	la	mi	rest	re	doh	re

121393	196418	317811	514229	832040	134269	2178309	3524578
2	3	4	6	1	6	6	3
re	mi	fa	la	doh	la	la	mi