Evolutionary Sketches

by
Youngmi Cho

Department of Music
Duke University

Date:_______________________
Approved:

___________________________
Scott Lindroth, Supervisor

___________________________
Stephen Jaffe

___________________________
Anthony Kelley

___________________________
Timothy Lenoir

___________________________
Rodney Waschka II

Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Music in the Graduate School of Duke University

2011
ABSTRACT

Evolutionary Sketches

by

Youngmi Cho

Department of Music
Duke University

Date: ________________________

Approved:

___________________________

Scott Lindroth, Supervisor

___________________________

Stephen Jaffe

___________________________

Anthony Kelley

___________________________

Timothy Lenoir

___________________________

Rodney Waschka II

An abstract of a dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Music in the Graduate School of Duke University

2011
Abstract

“Evolutionary Sketches” is a three-movement sextet composition for flute, clarinet in B♭, percussion, piano, viola, and cello. The idea of the piece is based on the study of applying scientific evolutionary theories to compositional techniques. The first movement reflects my attempt to realize the generic process of development from one generation to the next by natural selection, crossover, or mutation. In the second movement, I conceive an image of evolution in which changes take place through battles among different evolutionary factors over progress. The structure of the third movement explores the extensive use of cellular automata.
Acknowledgements

I would like to express my deep gratitude to my advisor Prof. Scott Lindroth, who has been a great support for me both artistically and personally in my studies at Duke. I also wish to thank the other members of committee, Stephen Jaffe, Anthony Kelley, Timothy Lenoir, and Rodney Waschka II for their productive support. Finally, I would like to thank my family for continuing to encourage me as I pursue my musical endeavors.
# Table of Contents

Abstract ...................................................................................................................... iv

Acknowledgements ......................................................................................................... v

Instrumentation .............................................................................................................. vii

Performance Notes .......................................................................................................viii

Description of Movements .............................................................................................. ix

Evolutionary Sketches.......................................................................................................1

I. Movement 1..............................................................................................................1

II. Movement 2...........................................................................................................15

III. Movement 3..........................................................................................................26

Biography ........................................................................................................................41
Instrumentation

Flute
Clarinet in B♭
Percussion*
Piano
Viola
ViolonCello

* Percussion:
Instrumentation – Triangle, Woodblocks, Xylophone, and Marimba

Triangle  Wood blocks

Mallets –

wooden mallets  soft mallets, yarn  hard mallets, rubber
Performance Notes

All notations are made at the actual pitch except the part of Xylophone; Clarinet in $B^\flat$ is written in $C$, and Xylophone is written in an octave lower than the actual sound. Preferably, all movements are to be conducted.

Ad libitum sections in movement 3:

The beginning of each section is marked with the word “ad lib,” a double-bar line, and an approximate duration of the section, indicated by line-notation. In the instruments given a repeat phrase, all the rhythmic values are approximate. In the other instruments, all rhythmic values are to be played by the given meter. Consequently, the placing of the notes one above the other between the two different instrumental groups in the score does not mean that they are played simultaneously.

Performance on the strings of Piano:

The player stands at the keyboard and hold down the pedal all the time for the strings section.

- $S_1$ sweep lengthwise along the string of the note given with finger.
- $S_2$ sweep up and/or back with finger between the strings of the given notes.
- $S_3$ pluck the string(s) of the given note(s) with finger.
- $K$ back to play on the keyboard.
Description of Movements

In Movement 1, I tried to use melodic variations for various mating processes beginning at bar 3; the crossover occurs every three measures as a unit. Vertical mating, harmonic variation is also considered together with melodic manipulation from bar 48, and rhythmic variations are shown from bar 68. The first half of the movement is considerably strict in the use of the crossover rules, but I freely mutated and modified the theoretical results in order to formalize the piece, e.g., reaching a climax and recapitulation.

With Movement 2, I envisioned invisible battles between dominant and recessive genes. The two different factors are heard through the sonorous and the discordant, the accompanied and the isolated, in musical terms, although I am not sure which one is more dominant than the other. Two different factors are introduced at the beginning part of this movement. Later on, some characteristics of each survive, they receive interference from a new factor, or they all become mixed and melt together.

Movement 3 is structured by cellular automata, a kind of biological models, a collection of cells that evolves by certain rules according to its neighboring states. Xenakis employed this principle to his later orchestral pieces to produce complex sonorities with minimal rules. I applied the technique to project the whole pitch system of this piece. As a cell grows into an organic body, a single pitch ‘D’ is expanded to D# / C#,
to E / C, and so forth, in this piece. Not linearly but symmetrically, the progress develops into complex harmonies. With the plan, I wanted to explore extensive diversity in instrumentation and sonic density.
* Always play the full duration of eighth notes.
The phras. can be played by two hands consecutively if the given range should be broken by the inside frame of Piano.
Winds and Strings individually trace the length of the rest for each commencement, and give the notes with an arbitrary urge.
Biography

Youngmi Cho (b. 1975) was born in Seoul, Korea. She received a B.A. degree in musical composition from Seoul National University studying composition with Cheong-Ik Chang in 2000, and a Master of Science in Arts Technology from Illinois State University in 2004.