Real-Time Composer-Performer Collaboration

As Explored In *Wilderness*, A Dance And Audio Installation

by

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ABSTRACT

From fall 2010 to spring 2011, the author was the pianist in twenty public performances of *Wilderness*, a site-adaptable dance and audio installation by choreographer Yanira Castro and composer Stephan Moore. *Wilderness*'s music was generated as the result of an algorithmic treatment of data collected from the movements of both dancers and audience members within the performance space. The immediacy of using movement to instantaneously generate sounds resulted in the need for a real-time notational environment inhabited by a sight-reading musician. *Wilderness* provided the author the opportunity to extensively explore an extreme sight-reading environment, as well as the experience of playing guided improvisations over existing materials while incorporating lateral thinking strategies, resulting from a real-time collaboration between composer and performer during the course of a live performance.

This paper describes *Wilderness* in detail with particular attention focused on aspects of the work that most directly affect the pianist: the work's real-time notational system, live interaction between composer and performer, and the freedoms and limitations of guided improvisation. There is a significant amount of multi-media documentation of *Wilderness* available online, and the reader is directed toward this online content in the paper's appendix.

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

Between October 2010 and March of 2011, the author was the pianist in twenty performances of *Wilderness*, a dance and audio installation by choreographer Yanira Castro and composer and sound artist Stephan Moore. *Wilderness* depends upon the movement dancers and audience members alike in order to generate sound, in the form of an electronic score transmitted via multi-channel audio and also as an algorithmically generated score for piano notated in real time and sight-read in performance by a live pianist. This document briefly discusses developments in both compositional and notational methods and how the need for real-time notation surfaced. Later, the author focuses on the pianist's experience in playing *Wilderness* with an emphasis on three specific areas. The first area of focus is the real-time notational system used in the piece. The second point of concentration is the live composer-performer collaboration that was specifically explored in *Wilderness*, and the final emphasis is on the use of lateral thinking strategies as a technique to be used in guided improvisation.

BACKGROUND

Every notation is the transcription of an abstract idea. … The performance of a
work is [also] a transcription. For a musical art-work … stands at once inside
and outside time.
        - Ferruccio Busoni[1]

New Ideas Beget New Notation

        Notation is one of the intermediate steps that lie between the composer's

creative mind and the listener's ear. In the case of traditionally-notated music, the

line of communication begins with the composer, who notates what he or she

wants to hear, and then continues with a performer or ensemble, who realizes the

composer's score and conveys it to an audience. The performer in this

conventional and vehicular model bears a large share of the communicative

burden; one of the performer's chief responsibilities (and challenges) is "to

transmit material he did not himself compose."[2] Many other variables also

contribute to the complex nature of the situation, including the ability of the

composer to indicate in visual form how to play their music, the skill of the

performer to execute the composer's wishes, and the wherewithal of the audience

to perceive aurally (with a wide range of subjectivity) what the composer has

written.

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[1] Busoni, Ferruccio. *A New Esthetic of Music.* Translation by Theodore Baker of *Entwurf einer neuen Ästhetik.* In *Three Classics in the Aesthetic of Music.* New York: Dover Publications, 1962: 85.

[2] Aloys Kontarsky, "Notation for Piano," trans. Vernon Martin, *Perspectives of New Music* 10, no. 2 (Spring – Summer, 1972): 72.

Early in the twentieth century, composers such as Charles Ives and Henry Cowell began to use new symbols, particularly in their piano writing, in order to express sounds or effects that had no existing method of notation, such as tone clusters, muted strings, "pizzicato" and other extended playing techniques that required the performer to play the piano's interior. John Cage, a one-time pupil of Henry Cowell, experimented with new notational systems that reflected his evolving approach to composition. Composer Earle Brown, who was an early proponent of graphic notation, wrote in 1964[3] that the notational practices of his contemporaries (who included John Cage, Morton Feldman and Christian Wolff) were "a continuation of attempts, on the one hand, to find a more accurate way of transcribing the nature of their aural image in graphics, and on the other, to develop and intensify the necessary (and complementary) relationship which must exist between the composer, the score, the performer, and the audience, in directions which are also conducive to the composer experiencing his image as sound."[4] An examination of one of Brown's most frequently performed (and discussed) scores, *December 1952* illustrates the concept that an expanding or changing musical aesthetic demands a departure from traditional notation.

The score for *December 1952* is printed on a single 11x17 folio and contains lines and rectangles of various thicknesses and proportions, oriented either vertically or horizontally. Brown's "prefatory note" indicates that the piece

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[3] Brown's notes to his 1964 lectures at Darmstadt were later edited and published in *The Musical Quarterly* in 1986; see footnote no. 3.

[4] Earle Brown, "The Notation and Performance of New Music," *The Musical Quarterly* 72, no. 2 (1986): 183.

is "for one or more instruments and/or sound-producing media" that it may be performed "in any direction from any point in the defined space for any length of time and may be performed from any of the four rotational positions in any sequence."[5] There are further performance instructions, but suffice it to say that every performance of a piece such as *December 1952* is unique due to the wide-ranging diversity and subjectivity of its performers. It would seem that through his notation, Brown intended to invite traditional classical performers to broaden their thinking about the nature of sounds—both the creation and the perception thereof—while also providing performers with the familiarity of having a score to read.[6]

There are many other examples of works similar to *December 1952* in regard to shifting aesthetics triggering innovative notational techniques. John Cage's *Variations I*[7] includes six transparencies, each with various lines and shapes printed on them, and very sparse instructions. Morton Feldman's *Intersection*[8] series of piano pieces instruct the performer regarding how many pitches to strike on any given beat. *For Five or Ten People*[9] by Christian Wolff and *Novara*[10] by Earle Brown are, along with the aforementioned works by Cage

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[5] Ibid., *Folio and 4 Systems* (New York: Associated Music Publishers, Inc., 1961).

[6] Keith Potter, "Earle Brown in Context," *The Musical Times* 127, no. 1726 (Dec., 1986): 683.

[7] John Cage, *Variations I*, New York: Henmar Press Inc., 1960.

[8] Morton Feldman, *Intersections 2 and 3*, looseleaf in *Solo Piano Works 1950-64*, New York: C. F. Peters Corporation, 1998.

[9] Christian Wolff, *For Five or Ten People*, New York: C. F. Peters Corporation, 1963.

[10] Earle Brown, *Novara*, London: Universal Edition Ltd., 1979.

and Feldman, just a few examples – Brown's *Novara* in particular is discussed later in the section entitled "Real-time Notation."

Computer Assisted Composition, Algorithmic Composition

The 1950s and 1960s were also a time of experimentation and innovation in the fields of electronic and computer music. Composers used electronic devices, both homemade and available commercially, to imitate or synthesize existing sounds; they also began to use computers as part of the creative process, including using what is known as Computer-Assisted Composition (CAC)[11]. One particular branch of computer music that has catalyzed a change in notational practices is that of algorithmic composition.

Karlheinz Essl, who teaches composition at the Vienna University of Music and Performing Arts, defines the term 'algorithm' as "a predetermined set of instructions for solving a specific problem in a limited number of steps."[12] Historically, the use of algorithms has been mostly limited to the fields of math and science. More recently, algorithms have been applied to other fields including musical composition.

Although 'algorithmic composition' often implies the use of computers and multimedia, there are many historical examples of music that can be considered algorithmic according to Essl's succinct definition. As early as the late

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[11] Jason Freeman, "Extreme Sight-Reading, Mediated Expression, and Audience Participation: Real-Time Music Notation in Live Performance," *Computer Music Journal* 32, no. 3 (Fall 2008): 26.

[12] Karlheinz Essl, "Algorithmic composition," in *The Cambridge Companion to Electronic Music*, ed. by Nick Collins and Julio d'Escriván (Cambridge: Cambridge University Press, 2007), 107.

9th Century, Hucbald of St. Amande gave instructions for adding a second voice to existing Gregorian chant, resulting in what is now called 'organum.'[13] Johann Sebastian Bach dictated specific sets of rules for the realization of his *Verschiedene Canones über die ersten acht Fundamental-Noten vorheriger Arie von J.S. Bach* (BWV 1087), essentially creating a musical riddle.[14] Several composers of the 18th Century, including Johann Philipp Kirnberger, Maximilian Stadler, Franz Josef Haydn and Wolfgang Amadeus Mozart experimented with musical dice games that yielded a multiplicity of possible realizations.[15]

Since the advent of the computer in the 20th Century, algorithms are frequently expressed as a computer program or as a software package. The earliest example of a composition derived from computerized algorithms is the *Illiac Suite*, generated by the University of Illinois's ILLIAC (Illinois Automatic Computer) in 1957. The work's programmers and composers, Lejaren Hiller and Leonard Isaacson, used the software's output to create printed traditional notation rather than electronic sounds.[16] Hiller later collaborated with John Cage for the piece *HPSCHD* (1967-9) in which chance operations were utilized through a software realization of the "I Ching."[17] *HPSCHD* also employs several other

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[13] Ibid., 109.

[14] Ibid.

[15] Ibid.

[16] Freeman, "Extreme Sight-Reading" 26.

[17] Essl, 112, 120-121.

computer programs, including one specifically designed to render a harpsichord part from Mozart's *Musical Dice Game*.[18]

Real-Time Notation

When applied to electronic music, algorithmic composition can often result in a rather fixed set of sounds, depending on the strictness of the algorithms themselves as well as any means taken to limit or filter the results of the calculations to suit the composer's desires. One branch of algorithmic composition that has had increased usage in the past several years is that of real-time notation. In a real-time notational system, the execution of an algorithmic program results not in digitized sounds, but rather generates a musical score (notated either traditionally or graphically) that is realized by live musicians.[19] The composer is able to filter, process and select certain bits of the algorithmic software's output and use the results as material for composition. Another striking aspect of the real-time notational system is that it is, according to Jason Freeman, "also influenced by an open-form aesthetic in which a musical score is read differently in each performance of a composition.[20]"

Just as we have seen that changing aesthetics and musical experimentation precluded certain changes in notational practice by composers of the New York School, so too have certain aesthetic considerations necessitated the need for real-

[18] Ibid., 121.

[19] Freeman, 25.

[20] Ibid.

time delivery of notes from the computer to the performer. In certain pieces, the score may be visible (or perhaps even projected above the stage) to the audience, which is already conditioned to realize the relationship between a score and a musical performance. Real-time notation has immediacy as a defining characteristic, and the very close proximity between creation and realization of music in such a construct brings a "heightened sense of anticipation[21]" to the performers as well as the audience, which probably knows on some level that the performers are juggling many variables and unknowns during the process of a performance.

Composer David Kim-Boyle has experimented with works that use real-time notation, both with traditionally notated output as well as graphic notation. One example of one of his traditionally notated works in real time is his *Valses and Etudes* (2005)[22] for piano, which uses scans from pre-existing scores by Schoenberg, Webern, Ravel, Debussy and Cage and then sorts them according to various parameters dictated by an algorithm. Various bits of the scores then fade into and out of the performer's field of vision, putting the performer in the position of having to play smoothly between various styles of piano writing that get fragmented and juxtaposed in various ways. The algorithm itself allows for a certain variety of outcomes and therefore calls for real-time notation in order to create the immediacy that the composer is seeking.

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[21] David Kim-Boyle, "Real-time Score Generation for Extensible Open Forms," *Contemporary Music Review* 29, no. 1 (Feb.2010), 5.

[22] Ibid., 6.

One example of Kim-Boyle's experimentation with real-time graphic notation is *tunings* (2006) for cello and computer. In *tunings*, the composer's graphic notation invites the performer to explore various sonic events on the cello. Various signs and shapes are used to encourage the cellist to explore the spectrum of bow speed, bow pressure, and to exploit various techniques such as harmonics and noise tones. All of these timbral explorations take place within the context of various excerpts from J. S. Bach's Second Cello Suite, which is fragmented and presented to the performer in a manner similar to that used in *Valses and Etudes*. The sounds from the cello are then routed to a separate computer, which manipulates the sound into a sonic tour-de-force for the audience, who hears not only fragmented and deconstructed bits of unaccompanied Bach, but also various other electronic sounds and excerpts from historic speeches.[23]

Earle Brown wrote that his use of new forms of notation became a necessity for many reasons, the most prominent being "to produce a 'multi-ordinal' communicative activity between the composer, the work, and the performer, and a similarly 'open' potential of experience for the listener.[24]" This complex composer-performer-audience relationship is exemplified in Brown's *Novara*, composed in 1962. The work is scored for flute, trumpet, bass clarinet, piano, and string quartet, and is published as a series of four pages each containing five "events" for various combinations of instruments, displayed in blocks of spatially-notation without bar lines. A conductor mediates the

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[23] Ibid., 9.

[24] Brown, Earle. "The Notation and Performance of New Music." *The Musical Quarterly* 72, no. 2 (1986): 180-201. "Notation," 199.

performance and indicates, with the left hand, the order in which the events are initiated. The conductor also indicates the general character and intensity level of a new section depending on the nature of the preparatory gesture, given by their right hand. When the conductor signals to begin a new event, only those players indicated in the event are to move on to the new one; those not indicated in the new event are to continue looping their current event until the conductor indicates a new event that does involve them. In the performance directions included in the score for Brown's *Novara*, the composer states:

> I have felt that the conditions of spontaneity and mobility of elements which I have been working with create a more urgent and intense "communication" throughout the entire process, from composing to the final realization of a work, I prefer that each "final form," which each performance necessarily produces, be a collaborative adventure, and that the work and its conditions of human involvement remain a "living" potential of engagement.[25]

Given Brown's *Novara* as an example of a work in which the composer functions to some degree as a situational architect, one may observe that a performer in such a work functions in true collaboration with the composer, especially when part of a piece's nature is to take the performers' and conductor's own creative faculties into account.

The typical chain of communication from the composer to the listener usually follows a pattern of composer, score, performer, and then listener. Algorithmic composition used in conjunction with real-time notational systems expands this line of communication to include the algorithm as well as the

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[25] Brown, *Novara*. London: Universal Edition Ltd., 1979.

resulting score (sometimes visible to the audience, depending on the piece). One

possible model for the various lines of communication in such a work would have

the algorithm generating the notation, which goes to the musicians who

subsequently affect the algorithm through their performance. The resulting sounds

make an impression upon an audience, which in turn either passively or actively

affects the algorithm's input.[26]

[26] Freeman, 29.

WILDERNESS

Description Of The Piece

      Wilderness is a site-adaptable dance and audio installation conceived, choreographed and directed by Yanira Castro[27], with sound design and interactive composition by Stephan Moore, lighting design by Roderick Murray, and costume design by Albert Sakhai. The dancers in every performance to date have been Peter Schmitz (soloist), Luke Miller, Pamela Vail, Darren Wright and Kimberly Young. Each performance has also had the composer Stephan Moore serving as a live electronics performer with the author playing the piano. To date *Wilderness* has been performed twenty times, including three times during its premiere run at the 2010 Filament Festival (October 1-3) in the Curtis R. Priem Experimental Media and Performing Arts Center (EMPAC) at Rensselaer Polytechnic Institute in Troy, New York. From October 20-21, 2010, *Wilderness* was presented in three performances at Vanderbilt College in Nashville, Tennessee. Between October 27 and November 7, 2010, it was performed ten times at the Invisible Dog Art Center in Brooklyn, NY. The piece was later given four performances during a residency March 24-26, 2011 at Franklin and Marshall College in Lancaster, Pennsylvania.

      Performances of *Wilderness* take place in an elliptical field of black rubber mulch measuring approximately 40 feet by 50 feet. A four-inch high retaining wall surrounds the ellipse and contains the mulch along with an array of nineteen contact microphones (each measuring between fifteen and nineteen inches in

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[27] An interview with Andrew Frank in which Yanira Castro discusses her work at length, especially *Wilderness*, is available online at http://bombsite.com/issues/1000/articles/4658 (accessed April 23, 2012).

diameter[28]). Sixteen custom light fixtures surround the field, each mounted approximately nine feet above the ground atop a conduit pole. Eight hemispheric speakers designed and built by Stephan Moore surround the field and are used in the realization of the electronic portion of the work's sound design.

Figure 1. Hemispheric speakers designed and built by Stephan Moore.

Just outside the ellipse is a piano with a flat-screen LCD computer monitor mounted in place of a traditional music rack (Figure 2):

Figure 2. *Wilderness* piano and real-time notation display as used in performances at *The Invisible Dog Art Center*, October – November 2010.

[28] Moore, Stephan. "Wilderness: A Description."
http://oddnoise.com/projects/md/wilderness/ accessed 3/25/12.

Near the piano and also adjacent to the ellipse is a table for the electronics performer, which has been the composer himself in every performance to date. The table holds a laptop computer, a digital audio interface, a laptop computer running a Max/MSP[29] patch designed by the composer, and a mixing board, as well as connections from the concealed contact microphones, and to the eight speakers surrounding the ellipse and to the pianist's computer screen. Preceding each performance of Wilderness, the stage manager[30] presets a number (up to a maximum audience of forty) of black stools in a two-row semicircle (figure 3):

Figure 3. Pre-show configuration of *Wilderness* installation. Photo taken by the author at the Curtis R. Priem Experimental Media and Performing Arts Center, Rensselaer Polytechnic Institute, Troy, NY.

Members of the audience leave their personal belongings and shoes with a coat check service on the premises of the performing venue. Each person receives a pair of clean black socks to put on. Once all audience members have arrived at the venue, they are admitted to the installation one at a time at intervals of

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[29] Max is an interactive graphical programming environment for multimedia and was developed in the late 1980s at the Institut de Recherche et Coordination Acoustique/Musique (IRCAM) in Paris.

[30] In every performance of *Wilderness* to date, the stage manager has been William Schaffner.

approximately thirty seconds. As they enter the installation and traverse the field of mulch toward the seat of their choosing, the concealed contact microphones (of which the audience is unaware) begin to transmit data to a Max/MSP. This patch generates an electronic score that is realized in eight channels of audio emanating from the loudspeakers surrounding the installation. Concurrently with the electronic score, the software also generates a piano score that is expressed via real-time notation and played during the performance by a sight-reading pianist.

From the moment people begin to walk within the installation, the resulting score begins to serve as an overture of sorts. It is assumed that the audience is unaware of the connection between their movements and their sonic environment. Once all viewers are seated, a solo performer enters the space. The oldest (fifty-nine years old at the time of *Wilderness*'s premiere) of the work's five dancers, Peter Schmitz's solo performance of approximately twenty-five minutes is rooted in movement but also employs a considerable amount of spoken word (both planned and improvised) as well as direct interaction with the audience. During the solo, the piano and electronic score remain governed by the same traits that audiences hear during the 'overture' section. The software uses the sounds detected by the embedded microphones and reproduces them at one quarter of their original speed, resulting in a swirling texture of sounds that are two octaves lower and four times longer in duration than their original, treated

with several different delay lines[31]. The piano score is generated by the same

software and produces a score via real-time notation based on the software's

manipulation of audio data input from the buried contact microphones.[32]Figure 4

illustrates the flow of data along with possible feedback loops that occur during

Section 1 of *Wilderness.*

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[31] Digital delay is "an electronic device which projects overlapping signals – i.e., a sound played directly, that same sound delayed by a small number of milliseconds, and that sound again some several milliseconds later; the delay can range to as much as several seconds, and the reproduced signal may be layered upon itself numerous times by means of a feedback circuit." Mark Gilbert and Barry Kernfeld. "Digital delay." In The New Grove Dictionary of Jazz, 2nd ed., edited by Barry Kernfeld. Grove Music Online. Oxford Music Online, http://www.oxfordmusiconline.com.ezproxy1.library.arizona.edu/subscriber/article/grove/music/J554700 (accessed April 20, 2012)

[32] Exhaustive descriptions of the algorithmic and score-generating processes used in *Wilderness* can be found within the composer's thorough description of the piece. See "Input Processing and Electroacoustic Score Output" and "Note Processing and Score Generation," Moore, Stephan. "Wilderness: A Description." http://oddnoise.com/projects/md/wilderness (accessed April 20, 2012).
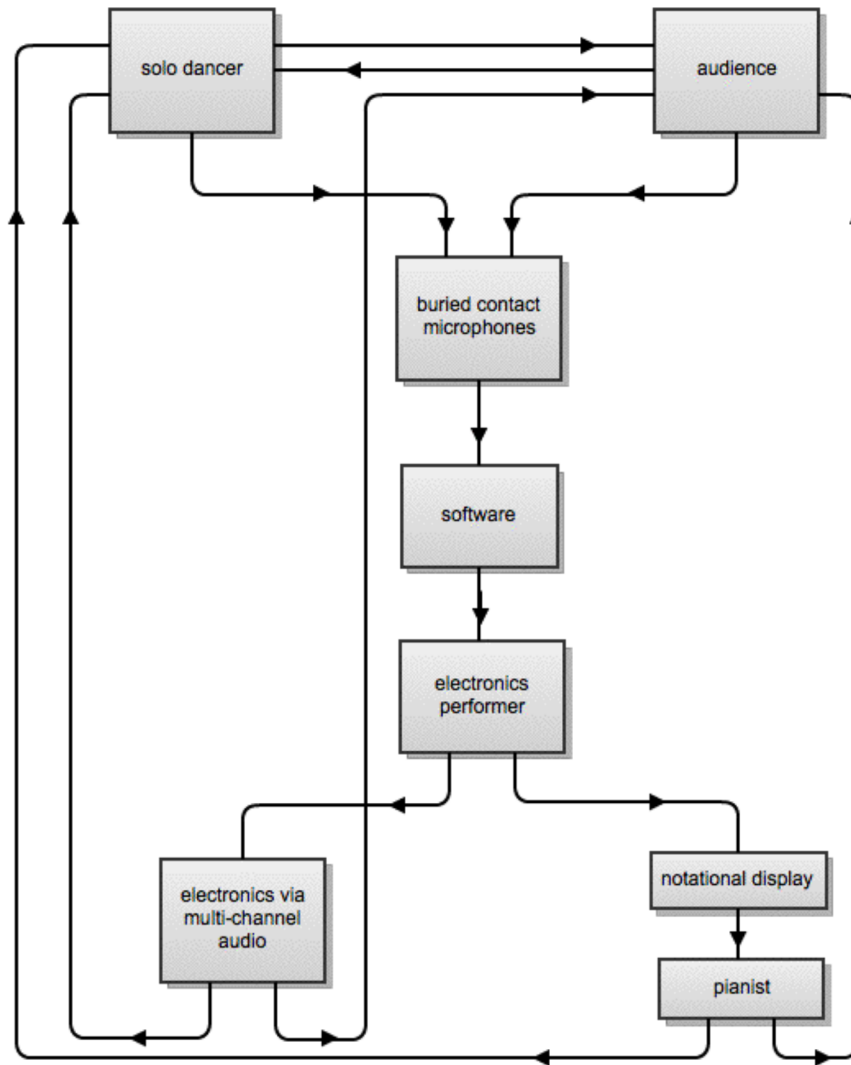
Figure 4: illustration of data flow and possible feedback loops in Section 1 of *Wilderness*.

At the end of the solo, the soloist slowly exits the installation and proceeds to a seat far from the ellipse but still visible to the audience. The stage manager begins to remove the black stools from the installation, non-verbally coaxing (sometimes unsuccessfully) any still seated to give up their seat. During this transition from the solo to the quartet, the piano and electronic scores eventually fall silent, providing a moment of structural silence and lending a clue to the

17

work's form. A quartet of dancers enters, and they begin to utilize a vocabulary of movement along with sections of spoken word and verbal improvisation, with many elements rooted in events that happened in the earlier solo. Though the quartet's movements are rehearsed and prepared to a certain extent, the sequence and manner in which they carry out their movements are largely based on behavioral cues from the audience (unbeknownst to the viewers themselves). Figure 5 illustrates the flow of data and possible feedback loops occurring in *Wilderness*, Section 2:
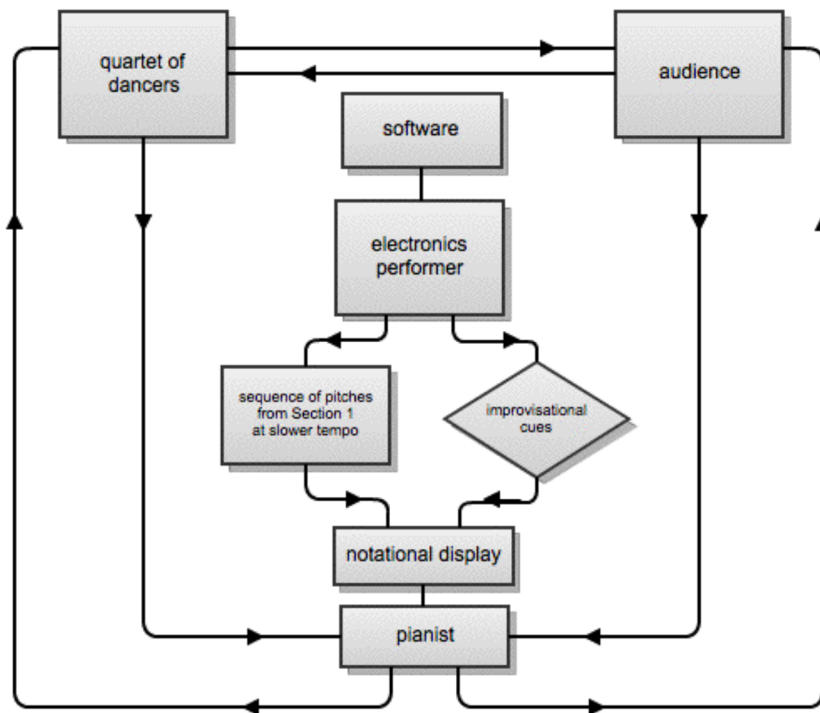

Figure 5: illustration of data flow and possible feedback loops in Section 2 of *Wilderness*.

The multi-channel audio system (which realizes the electronic component of the score) is silent following the solo – the only music heard during the quartet comes from the piano. Once the quartet (known to the musicians as "Section 2")

18

begins, the electronics performer begins to transmit a score to the pianist's

monitor. The pianist sees the same pitches that were generated during the solo,

along with their original sequence and spatial rhythmic placement; the difference

during Section 2 is that the notes appear at half the original tempo, along with the

instruction to use the notes as a basis for improvisation, using clusters, lines and

sonorities based solely on pitches that appear on the piano screen at any given

moment. The quartet typically lasts forty-five to fifty minutes, after which each

member of the quartet individually exits the space while the remaining dancers

continue to perform; once all dancers have left, the lights slowly fade to blackout,

and the supply of notes to the piano screen dwindles to nothing. Performances of

Wilderness tend to run for a total of seventy-five to eighty minutes.

In the very first draft of performance indications that the composer sent

the author concerning *Wilderness,* the instructions for Section 1 were detailed

thus:

> "Part one (Peter's solo) is predominated by a "pointillistic" performance style. No use of pedal. Absolute monophony must be maintained, even when two notes appear to be vertically simultaneous. The performer should struggle to perform every note, and to preserve the rhythm & tempo of the notes as they appear on the staff as closely as possible, not falling more than 1-2 seconds behind the notes' appearance. In this struggle, the performer should also honor all mistakes, and never attempt to repeat a missed passage, work in a skipped note, or in any way correct what has already happened. It is always time to move on.[33]

The author's initial experiences with the notational system used in

Wilderness reminded him of a sight-reading lesson given to him during his

undergraduate years in which the teacher placed an unfamiliar Bach work in front

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[33] Ibid.

of him at the piano and instructed him to play; in order to discourage him from playing too slowly or from dwelling on anything too long for the sake of ease or comfort, after he began to play she started covering the first line of the score steadily from left to right, essentially forcing him to keep a certain pace. "It is always time to move on" is an axiom not only for a pianist in *Wilderness* but also for anyone playing in a dynamic sight-reading environment.

The author found *Wilderness* to be a metaphor for the unknown, both philosophically and aesthetically. The most immediate aspect of the unknown for the pianist is that the piece is always sight-read; no two performances yield the same piano score, so it is utterly impossible to practice for *Wilderness* in the traditional sense. It is only possible to gain a limited familiarity with the piece's parameters and constraints, rather than its transitory, ephemeral musical content. A historical precursor to such a unique musical challenge may be found in John Cage's *Music of Changes* (1952). Due in no small part to its chance-derived content, *Music of Changes* presents an extreme challenge to any pianist who attempts even a surface level of familiarity with it. Pianist David Tudor described the process of learning this very unpredictable piece thus:

> When I came to the Cage I had to work on the moment-to-moment differences. *Music of Changes* was a great discipline, because you can't do it unless you're ready for anything at each instant. You can't carry over any emotional impediments, though at the same time you have to be ready to accept them each instant, as they arise. Being an instrumentalist carries with it the job of making certain physical preparations for the next instant, so I had to learn to put myself in the right frame of mind. I had to learn how to be able to cancel my consciousness of any previous moment, in order to be able to produce the next one." [34]

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[34] Tudor, David. "From Piano to Electronics." *Music and Musicians* vol. 20, Aug. 1972, p. 24-26.

Real-time Notation in *Wilderness*

   The notational system in *Wilderness* consists of four traditional grand staves displayed on a computer monitor. Each grand staff represents fifteen seconds of time, and the notes appear as an invisible cursor proceeds from left to right across each system. A traditional black note head indicates the notes that occur on the piano's white keys, while a diamond-shaped note head is used to indicate that the indicated pitch should be raised one half step. During the piece's early development, experiments with traditional flats and sharps proved to clutter the visual display, prompting our experimentation with alternative note heads to indicate accidentals. The use of the diamond-shaped note head turned out to be an efficient way of displaying music in a real-time environment, not only eliminating a good amount of visual clutter, but also streamlining the performer's mental process of calculating accidentals. In the system used in *Wilderness* and subsequent real-time scores by Moore, there are no enharmonic equivalents to navigate; the only five possible accidentals are C#, D#, F#, G#, and A#. Using this method, all twelve chromatic tones are still available; a black note head always indicates a white key, and a diamond note head always indicates a black key. In a sense, this form of notation functions also as a type of tablature, supplying not only pitches but also giving a sense of the keyboard's black-white topography. Due to this particular chromatic system, the pianist never has to navigate topographical "exceptions" such as F-flat or B-sharp.

For the pianist, *Wilderness* instigated an unusually paradoxical

relationship between a performer and a piece of music. In more traditional

works—any piece from the standard chamber music repertoire, for instance—it is

possible to spend hours in preparation making the piece familiar both to the

individual members of the ensemble (practice) and to the ensemble as a whole

(rehearsal). Practice time is spent getting the work into one's fingers, ears and

brain, through playing, listening, and careful analysis. Individual practice is often

focused on perfecting the more immutable aspects of a piece: the notes, rhythms,

and other details provided in the printed score. In contrast, ensemble rehearsal

counts individual practice among its own prerequisites before the group can move

on with the collective preparation of a cohesive artistic performance. Given the

unique and fugitive nature of the musical score for *Wilderness*, the only practical

way the author had to prepare was to have a basic level of understanding the

notational interface along with the composer's performance indications. This

preparation was made possible through a simple version of the software, a

demonstration of the notational system in the form of a tutorial etude (see Figures

6, 7, and 8) that the composer provided in advance of the first *Wilderness*

rehearsal with the author in September, 2010. Because the staves proved to be too

crowded when traditional accidental markings were used, Moore devised a few

alternative methods of notating twelve chromatic tones in the form of a keyboard

tablature, expressing white keys as traditional black note heads and black keys as
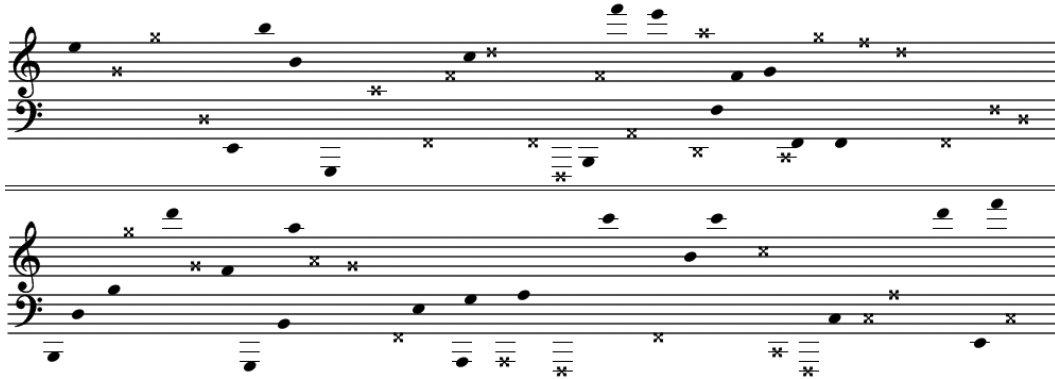
an alternative note head type.

Figure 6: Sample score generated from tutorial version of *Wilderness* notation software by Stephan Moore; this first experiment used a traditional double-sharp sign for all black keys.
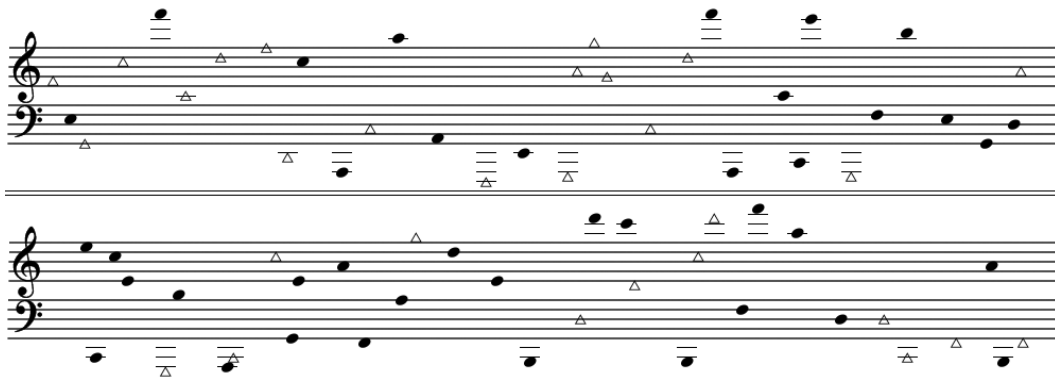
Figure 7: Sample score generated with the second experimental note head, a triangle often found in percussion notation.
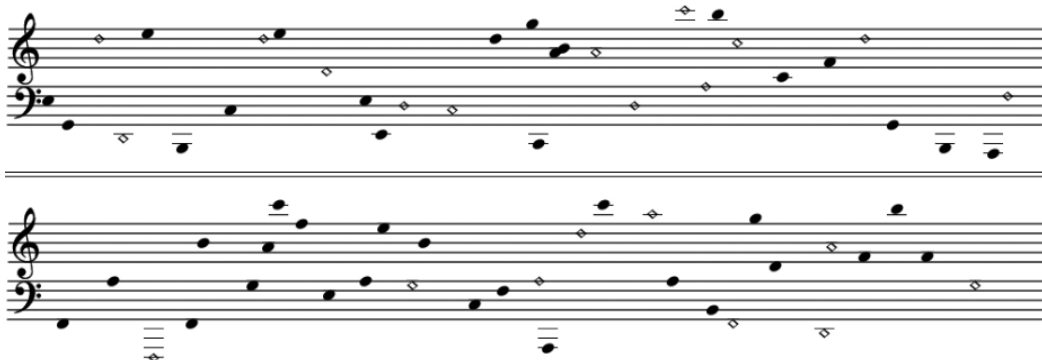
Figure 8: Sample score generated using the third and final experimental note-head, a diamond.

Composer-Performer Collaboration

Wilderness's performance instructions for the pianist can be simplified thus: in Section 1 (solo dancer), play pointillistically, mechanically and detached, and play each note within a second or so of its appearance on the screen; in Section 2 (quartet), use the notes that appear on the screen in an improvisatory and more expressive manner. The slower appearance of pitches on the piano's computer display in Section 2 gives the pianist a bit more time to calculate what to play as well as how to play. Every note that appears is not necessarily used, but there are no notes used that have not recently appeared on the screen. Composer, pianist and improviser Vijay Iyer aptly described the act of composing for improvisers thus:

> Where performers need scripts, improvisers need stimuli and constraints. Composing for improvisers becomes a kind of architecture: the construction of spaces that frame, enable, and contextualize human action, without overspecifying these actions. The composer becomes instead an architect of environments, a contriver of situations. Relinquishing more levels of control to the improvisers, this situational architect loses the traditional composer's centrality, but is rewarded with an improvised expansion of the music beyond its original design.[35]

Lateral Thinking And Guided Improvisation

Throughout the rehearsal process, the composer and the author found that although the author was playing Section 2 as indicated, his own minimal experience as an improviser yielded a somewhat limited variety of textures and musical gestures. Further, the composer found that he wanted the piano to remain

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[35] Iyer, Vijay. "Improvisation: Terms and Conditions." Chapter 19 from Arcana IV, musicians on music, ed. John Zorn. NY: Hips Road, 2009, p. 172

silent periodically, even if just for brief moments. In order to achieve greater musical variety and to introduce periods of silence into Section 2, Moore incorporated the use of brief messages and instructions that would appear on the piano screen. Any time a message would appear on the piano screen, the author was to take a brief rest from playing and read a prompt for the following subsection of music, and the composer would keep the message present on the piano screen until he felt it was time to move on to the next section. Further, the messages gave the author instructions regarding what interpretive approach he should take with the following portion of music.

When the author first began using the on-screen instructions in Section 2, the composer's guidance concerned the adjustment of specific musical parameters, such as more pedal, less pedal, fewer chords, more chords, more detached, more connected, et cetera. This approach did have the effect of generating greater musical variety, but did not always yield what he was looking for. Moore then introduced the author to the concept of *Oblique Strategies*, which first appeared in 1975 as a deck of cards by musician Brian Eno and artist Peter Schmidt[36]. Eno and Schmidt developed *Oblique Strategies* as a part of their own collaborative process. They describe the set thus: "A deck of cards created as a tool for addressing difficulties in the creative process. On each is printed one in a set of observations of the principles underlying what we were doing." Examples of text appearing on the cards include "Take away the elements in order of apparent non-importance," "Convert a melodic element into a rhythmic element,"

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[36] Commentary about the publication history and availability of *Oblique Strategies* can be found online at http://www.rtqe.net/ObliqueStrategies/.

"Emphasize the flaws," "Don't break the silence," "Use an old idea," and "Honor thy error as a hidden intention." Though Eno and Schmidt's strategic cues are aimed at artists, musicians, writers, and those generally working within the creative realm[37], they stem from a larger concept known as "lateral thinking," or "creative thinking that deliberately attempts to reexamine basic assumptions, to change perspective or direction, or to provide a fresh approach to solving a problem[38]." Lateral thinking is sometimes referred to as "thinking outside the box."

Rather than use Eno and Schmidt's *Oblique Strategies* verbatim, Moore invented and employed similar cues on his own to suggest different ways of playing. Like the aforementioned deck of cards, the composer's prompts sometimes addressed concrete musical parameters, such as "Definite rhythmic patterns, a la Britten at his spiciest. But, absolutely no artificial restatements of pitches," "An ultra-literal experiment: tie the thickness or thinness of incoming notes to every other musical parameter within your control in some way," or "don't actually play the notes you are given, play glissandos from note to note, leaving out the notes themselves. Cleverly disguise your glisses as something else. You don't need to play every in between note." Many of the on-screen prompts used imagery. Examples of this type of cue included "Dropping paint pellets into the river from the bridge. Your painting is long, it trails into the

[37] Brian Eno discussed the origins of *Oblique Strategies* at length in a November 8, 2010 BBC 6 Radio interview with Jarvis Cocker, available for online viewing at http://www.bbc.co.uk/blogs/jarviscocker/2010/11/jarvis-talks-to-brian-eno-abou.shtml (accessed April 21, 2012).

[38] VandenBos, Gary R. (editor in chief) *APA Dictionary of Psychology*, 1st edition. Washington, DC : American Psychological Association, 2007.

distance," "An intersection of a small Michigan town late at night. A single traffic light. A buzzing sodium lamp. Too cold for crickets. You can see your breath. Distant taillights," and "Practice ventrilopianism: make your sounds appear to come from different people and places in the room. Make them say inappropriate things." The composer and the author also experimented with the use of abstract visual images, as exemplified in Figure 9.
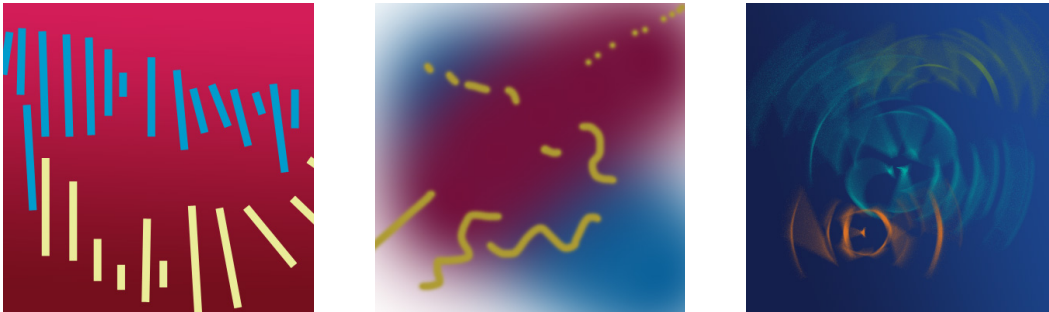

Figure 9. Abstract images by Stephan Moore used as improvisatory cues in the notation of Section 2 of *Wilderness*.

The external cues (both verbal and abstract) that Moore used in Section 2 became a vital part of the notational system used in *Wilderness*, just as traditional expression markings (both verbal and graphic, in addition to notes and rhythms) are essential to the notation of many works of music published since the late 18th century.

As a performer who is much more accustomed to interpretation and reproduction than improvisation, the author found that the external cues (both verbal and visual) were extremely useful in helping to access his own creative instincts and sensibilities. The cues that concerned specific musical parameters—such as "play definite rhythmic patterns" or "play glissandi between

27

each note"—were fairly easy to incorporate into his playing of Section 2. The abstract cues, whether verbal or visual in nature, required more imagination and often yielded more interesting results when applied to the pitches the author confronted. By shifting his focus from trying to satisfy specific instructions or parameters to attempting to realize an abstract concept via improvisation on a transitory set of musical pitches, the author was able to improvise with less inhibition and greater fluidity. Pianist and composer Vijay Iyer succinctly described an improviser's relationship to the composer: "An improviser develops an analytical take on a composition's contents in order to improvise against it, to turn the composition against itself and against its composer. Improvising against (or, at the very least, "not with") the composer becomes a path towards discovery—not of the composer's intent (which is a useless concept) but of musical possibility."[39]

The author has now played several scores by Moore subsequent to *Wilderness* that utilize a similar notational system, including *Liquid Sgraffito* and *Transliteration 1: Venice shipyard*[40] (both for piano and multi-channel audio) as well the dance pieces *Paradis*[41] and *Distance Between*[42]. Some of them, like

[39] Iyer, Vijay. "Improvisation: Terms and Conditions." In *Arcana IV, musicians on music*, edited by John Zorn, p. 173. New York: Hips Road, 2009.

[40] Stephan Moore and the author premiered these works together in a program presented at Brown University in Providence, Rhode Island, Nov. 2, 2010.

[41] *Paradis* was conceived, directed and choreographed by Yanira Castro and is the first site-specific dance installation ever to be presented in the over 100-year-old Brooklyn Botanic Garden. It premiered in June 2011, and at the time of this writing is scheduled to reprise at BBG in July 2012.

Wilderness, have included a performance direction at some point to improvise

using pitches that appear on the display, but did so without the use of the

previously discussed cues that can appear on the piano screen. Through the

extensive process of performing *Wilderness* twenty times, the composer and the

author learned a great deal about the author's improvisatory abilities and creative

instincts. As a result, the composer and author have discontinued the use of

specific external cues (verbal or abstract) in their collaborations that have

occurred since the final performance of *Wilderness*. The author's own instincts for

variety and creativity in improvisation sharpened demonstrably as a result of the

experience of playing *Wilderness*, therefore corroborating the ideas that creativity

is teachable and that lateral thinking is a proven educational tool for the

development of creative skills.[43]

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[42] *Distance Between* was choreographed and danced by Kimberly Young, who premiered the work along with Stephan Moore and the author at the University of Arizona on April 1, 2012.

[43] Huang, Tse-Yang. "Creativity Training." Encyclopedia of Giftedness, Creativity, and Talent. Ed. Thousand Oaks, CA: SAGE, 2009. 220-22. SAGE Reference Online. Web. 7 Apr. 2012.

CONCLUSION

The author found the process of rehearsing and performing *Wilderness* to be a completely extraordinary experience that brought significant challenges as well as substantial rewards. The uncertain territory surveyed in *Wilderness* turned out to be an exploration of the unknown not just for the audience and the dancers, but for the pianist as well. The author's own existing sight-reading skills were among the considerations made when Stephan Moore was first formulating the compositional aspects of *Wilderness*, and the piece itself proved to be a factor in considerably improving these skills during the total process of presenting a piece of a uniquely unpredictable, and often volatile, nature. The author's ability to improvise on given materials with fluidity and intention also expanded appreciably as a result of *Wilderness*, largely due to external cues created by the composer that were transmitted via real-time notational display during performances to the pianist/author. Most of all, the work afforded the author the experience of collaborating not only with an innovative composer, but in essence offered an immersive collaborative phenomenon that counted dancers, a choreographer, an audience, and a composer as part of a shared experience—an ephemeral and communal exploration of the unknown. This complicated relationship between an audience, a work's creators, and its performers, along with their collective journey through uncharted territory, are among the most intrinsic qualities found in *Wilderness*.

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APPENDIX A

ONLINE MULTI-MEDIA DOCUMENTATION OF *WILDERNESS*

A substantial collection of multi-media documentation of *Wilderness* is accessible from the author's personal website. Materials linked or embedded there include a brief video trailer of a performance at The Invisible Dog Art Center in Brooklyn, New York, a video of a complete performance (73 minutes) at The Invisible Dog, an audio sample of the piano and electronic scores, a video demonstrating the real-time notational display used in *Wilderness,* and other *Wilderness*-related photos from the author's personal collection. This documentation is available at the following URL:

http://www.michaeldauphinais.com/research/wilderness

APPENDIX B

FUNDING CREDITS FOR *WILDERNESS*

Wilderness was commissioned by Dance Theater Workshop's Commissioning and Creative Residency Program, and by the American Music Center Live Music for Dance Program. Wilderness was funded, in part, by The Jerome Foundation, the Composer Assistance Program of the American Music Center, Meet the Composer's MetLife Creative Connections Program, and EMPAC through an artist residency and production support: Experimental Media and Performing Arts Center (EMPAC), Rensselaer Polytechnic Institute, Troy, NY. Wilderness was also supported with public funds from the New York State Council on the Arts, a state agency.

The tours of Wilderness were made possible by a touring grant from the National Dance Project, a program of the New England Foundation for the Arts.

Wilderness was also made possible by the amazing generosity of the following individuals: JG y Haydee Castro, Sabine Dabady, Colin & Alice (Vail) Johannen, Jose Negroni Diaz y Lorraine Hernandez Caban, Heather Olson, Liam O'Rourke, RP, and Scottie and Walter Vail.[44]

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[44] Castro, Yanira. acanarytorsi.org (accessed March 25, 2012).

APPENDIX C

BIOGRAPHICAL SKETCH OF STEPHAN MOORE

Stephan Moore is a composer, performer, audio artist, sound designer and curator based in Brooklyn and Providence. His creative work currently manifests as electronic studio compositions, improvised solo performances, sound installation works, scores and sound designs for collaborative performance pieces, and sound designs for unusual circumstances. Evidence, his long-standing project with Scott Smallwood, has performed widely and released several recordings over the past decade. He has created custom music software for a number of composers and artists, and has taught workshops and numerous college-level courses in composition, programming, sound art and electronic music. He curates the annual Floating Points Festival at Issue Project Room in Brooklyn, where he also serves on the Art Advisory Board. From late 2004 to mid-2010, he performed over 250 concerts with the Merce Cunningham Dance Company, serving as their sound engineer and music coordinator, and as a touring musician.

Stephan Moore's website can be found at oddnoise.com.

APPENDIX D

BIOGRAPHICAL SKETCH OF YANIRA CASTRO

Yanira Castro is a director/choreographer based in Brooklyn who collaborates with performers and designers on individual projects under the name: a canary torsi. Her performance works integrate movement, installation, music, text, and visual elements such as film and video. She has developed work for a variety of spaces including: the Old American Can Factory, The Gershwin Hotel, The Invisible Dog, and Brooklyn Botanic Garden, among others.

Castro's work has been presented in New York by Dance Theater Workshop, Performance Space 122, The Chocolate Factory, the Experimental Media and Performing Arts Center (EMPAC), and HERE Arts Center, among others. Her work has toured nationally and internationally. Her piece *Dark Horse/Black Forest* received a 2009 New York Dance and Performance BESSIE Award, and was presented in the public bathrooms of the George Bacovia Theater in Bacau, Romania, the Daile Theatre in Riga, Latvia and the Tanzhaus in Düsseldorf, Germany for the International Tanzmesse.

Castro has been recognized with various awards including NEFA's National Dance Project Touring Award, The Jerome Foundation, The MAP Fund, New York Foundation for the Arts BUILD, Meet the Composers Commissioning Music/USA program, American Music Center Live Music for Dance, Trust for Mutual Understanding, USArtists International, and LMCC's Swing Space program, among others. Castro received her B.A. in Theater & Dance and Literature from Amherst College.

Yanira Castro's website can be found at acanarytorsi.org.