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'Musical Gesture' in Analysis
Gesture-Class as a formal structure

THESIS

submitted in partial satisfaction of the requirements
for the degree of

MASTER OF ARTS

in Music

by

Anthony Caulkins

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ABSTRACT OF THE THESIS

'Musical Gesture' in Analysis: *Gesture-Class as a formal structure*

By

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Master of Arts in Music

University of California, Irvine, 2016

Professor Christopher Dobiran, Chair

In this paper, I examine notions of musical gesture and their possible compositional and analytical applications. As a point of departure, I provide a provisional definition of musical gesture; I then posit a theory of gesture classification that draws on language used in post-tonal set theory, in order to develop the formalized structures of gesture-classes and gesture-class sets. These concepts serve as the basis for my analysis of music by Franco Donatoni, Cecil Taylor, and Mari Kimura. I use Franco Donatoni's *Omar: due pezzi per vibrafono* to present and illustrate how a set theory of gesture can be applied to musical composition. Building on the sets shown in *Omar*, I discuss Cecil Taylor's *Indent* in order to demonstrate systems of gestural flow between gesture-classes and gesture-class sets. Finally, I use Mari Kimura's *Clone Barcarolle* to exemplify the complex relationships that exist in the hybrid space between musical and physical gestures. Through each of these brief case studies, I aim to provide vocabulary with which to describe music that can be seen as gestural in conception or construction, as well as insight into possibilities for new forms of composition based on exploration of gesture as a formal musical element.

Classification of "Musical Gesture'

The term 'musical gesture' can refer to a physical sound-producing gesture or, in a more abstract sense, to a sound that metaphorically invokes a sense of motion from one point to another. Examples of physical sound producing gestures tend to be clear and numerous, for instance, the bowing of a cello string, the striking of a xylophone key, or the strumming of the strings on a zither. Each of these examples is easy to imagine and connect to motion. Metaphorical invocations of motion, on the other hand, tend be much more subjective and are almost certainly culturally contingent in how they are understood. For instance, a rapidly descending scale could be heard as a metaphorical invocation of some kind of downward gesture or a trill could be heard as some kind of fast repetitive gesture that is directionally static. Although these types of musical gestures are subjective and somewhat elusive in definition (even my attempted descriptions of musical gestures were somewhat wordy and obscure), they will be the primary focus of this paper.

This is not to suggest that there is no connection between the literal and abstract uses of musical gesture. In fact, the connections between both literal and abstract musical gesture provide for a great deal of potential discussion concerning new ways of understanding musical construction on a formal level. Over the past twenty years a large amount of research has been conducted on tracking and describing physical gesture. However, comparatively less work has been done to explicitly define musical gesture and apply it in systems of composition.

For the purposes of this paper, I will use the following definition to describe musical gestures: **Musical Gesture –** *a distinctive piece of musical material that metaphorically expresses a physical gesture, either literal or abstract*.

I am choosing to restrict my definition to metaphorical expressions so as to exclude the literal physical actions that go into making musical sounds, such as plucking a string or striking a key. Through this restriction, I hope to avoid problems that arise with the conflation of expressed gestures within music and the actual movements that go into making those musical gestures. As I will show in a musical example by Mari Kimura, this distinction can be somewhat ambiguous. A definition of musical gesture similar to the one that I have proposed can be seen in the article, *A Method for Computer Characterization of "Gesture" in Musical Improvisation*, in which Christopher Dobrian describes musical gesture as referring:

> …not so much to the physical action of a performer as to ways of characterizing musical content; the content itself implies motion, and that motion conveys characteristic meanings. (Dobrian 1)

Even in most forms of electronic and computer music, where the literal physical gestures associated with the music making are often fairly insignificant (i.e. typing and mouse clicks), musical gesture is still primary to the understanding of the sounds and events that comprise this music. The 'build-up' and subsequent 'bass-drop' in an Electronic Dance Music (EDM) track, for example, illustrate the strong ties to physical gesture in music that is created almost entirely on computers. The descriptive phrases 'build-up' and 'bass-drop' suggest certain physical gestures and spatial relations that are being implied in the music.

I do not wish to suggest that any musical material contains an objective relation to physical gestures or to the physical world in general. In the EDM example, the textural and spatial metaphors of building up and dropping are culturally determined descriptors for musical elements such as change in texture, rhythmic content, pitch contour, and overall dynamic energy of the music. A non-Western culture whose musical descriptors rely on different types of spatial metaphors from those in the West might not describe these musical situations as building up or dropping at all. Perhaps the descriptions would be lifting, or spinning, or aging, or any other metaphor, most likely relating to motion, time, or space. Leonard Zbikowski describes the possibility of different metaphorical understanding of musical relationships in his chapter on "Cross-Domain Mapping" from his book *Conceptualizing Music: Cognitive Structure, Theory, and Analysis*, in which he gives multiple examples from different world musical cultures. "As common as conceiving of pitches as 'high' or 'low' seems, not all cultures describe pitch relationships in purely spatial terms." (Zbikowski 67)

The understanding of musical gesture as being some kind of transmission of physical gestural data is the primary distinction between musical gestures and other basic types of musical material (i.e. melodies, phrases, motives, cells, etc.). While phrases, motives, and cells tend to be described in 'purely musical' terms (which is admittedly a complicated idea in and of itself), musical gestures exist in a hybrid space between the perceived musical world and physical reality. Some examples might be the classical 'musical sigh', or a chord 'stab', or an intervallic 'leap', or even the previously mentioned 'build-up' and 'bass-drop'. Each of these examples describes both a musical event and a type of physical action.

Besides existing in a hybrid space of understanding between musical expression and physical reality, each of these examples displays an evocative metaphor designed to describe the intentional content of these musical figures, while also remaining somewhat vague in their evocative nature. What I propose is still a metaphorical understanding of musical gesture, but one with some defined boundaries so as to allow for specific discussion of gesture as a formal and compositional device. Of course, the line between what constitutes a musical gesture versus what constitutes a musical motive is somewhat blurry. The idea is not that any discrete piece of musical material might be exclusively one or the other, but rather that it could be either, depending on what it subjectively represents, from a metaphorical point of view.

In his article on the characterization of musical gesture, Oded Ben-Tal describes elements necessary to characterize musical gestures as being unique and distinct from one another.

> To understand something as a musical gesture it needs to have a clear and self-contained identity. It has to be perceived as a discrete entity, with its own beginning and end, to have a coherent profile (shape or envelope), and it must draw attention to itself and have weight. An *expressive unit gesture* is understood as totality – its constituent parts all subsumed by the larger purpose. (Ben-Tal 252)

Building on Ben-Tal's attempt to describe some important features that are needed for a musical gesture to exist as a singular unit, I propose a system of gesture classification, based loosely on post-tonal set theory, with which to distinguish specific types of gestural content and use them as compositional and analytical tools.

Throughout this paper, the term gesture-class will refer to the following: **Gesture-class** –

A categorization of musical gestures into generalized types (or classes) of gestures, based on shared traits or criteria e.g., pitch contour, dynamic contour, articulation profile, etc.)

Building on this definition, gesture-classes can be combined to form groupings or 'gesture-class sets', which may appear linearly as individual instances of the constituent gesture-classes, or vertically as simultaneous instances of each of the constituent gesture-classes. Through these abstracted classes, formalized compositional procedures can be derived and applied. Establishing gesture-classes allows for systematized discussion of types of music that tend to be generally described as "gestural".

In order to illustrate the practical uses of gesture-class, I will consider the music of three different artists: Franco Donatoni's piece, *Omar: due pezzi per vibrafono* (1985); Cecil Taylor's solo improvisation, *Indent* (1973); and Mari Kimura's piece, *Clone Barcarolle* (2009), for violin and 'Augmented Violin'. Each of these pieces clearly, but differently, displays gestural characteristics. An investigation of these works from the perspective of gesture-class analysis shows illuminating similarities in the artists' work and provides a new way of discussing formalized structures within gestural music.

Gesture-Class in Franco Donatoni's *Omar*

Franco Donatoni's work as a composer is usually separated into two periods. The first, until 1975, consists of music dealing primarily with indeterminacy and aleatoric compositional practices.[1] Donatoni's works from this period are heavily influenced by the music and compositional practices of the composer John Cage, combined with the

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[1] See Michael Gorodecki, *Who's Pulling The Strings?*, page 246.

standard objective transformational procedures of the European post-tonal school (i.e.

inversion, retrogression, transposition, etc.). Many of Donatoni's compositions from this

period involve taking pre-existing musical material from earlier European composers,

such as Mozart or Schoenberg, and applying objective algorithmic procedures to it, in

order to derive variation and transformation.

Donatoni's second period, starting in 1977 (his self-described 'joyous' period) is

generally considered the most representative of his musical style.[2] Prior to this stage,

Donatoni had a two-year spell with no musical output, due to his struggles with

depression and feelings of compositional irrelevance. His 'joyous' period is particularly

fertile for theoretical study, due to his high level of musical output and consistency of

style. During this period, Donatoni composed as many as ten pieces per year, each of

which follows a uniform method of composition, with minor variations from piece to

piece. This method is driven by four guiding principles:

1) Cellular exposition and organism growth
2) Growth without development, conservation of the fragment
3) Juxtaposition of organisms; mutation, not evolution
4) Stasis of pulsations, continuity of tone, "night" atmosphere, noises, murmurings, vibrations like moving timbres in an immobile space (Decker 246)

Donatoni credits his derivation of these four principles to a rigorous study of Béla

Bartók's *Fourth String Quartet*.[3]

Implicit in these guiding principles is a sense of organicism in the progression of

music. Within Donatoni's music, a piece of musical material may grow throughout a

work's duration; however, its fundamental essence and being will never change. This can

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[2] See Bradley David Decker. *Preserving the Fragment: Techniques and Traits of Franco Donatoni's Joyous Period (1977 to 2000)*, especially Chapter 2 "Donatoni's Stylistic Schism".
[3] See Gorodecki, page 246.

be likened to the idea of a tree growing over time: no matter how big or in which direction a tree grows, it will always be a tree. This same basic notion applies to discreet pieces of material in Donatoni's music.

In Donatoni's work, these fours principles are combined to develop a compositional structure that he described as a *figura*, or 'figure' in English. These figures became the primary structural unit in his music and are used to develop a sense of consistency throughout his spastic and ever-changing textures. "Even while the exact internal make-up of intervals and/or durations continuously changes, a consistency of 'figure' arises." (Gorodecki 248) The notion of *figura* will be the framework for how I apply what I refer to as 'gesture-class analysis' to Donatoni's, *Omar*. However, this analysis is seen through the lens of gestural expression and its hybrid musical and physical implications, rather than as purely musical bits or fragments, as *figure* (plural of *figura*) are traditionally understood.

Omar: due pezzi per vibrafono, written in 1985, consists of two distinct movements that are usually performed in sequence. Like many of Donatoni's works, the music exists as a series of formal panels, each exploring a certain gesture-class or gesture-class set. For the purposes of this analysis, I will use Bradley David Decker's definition of Donatoni's panels: "the preservation of a musical element (such as rhythm, pitch-class, or formal element) over a period of time, resulting in a feeling of relative stability." (Decker 31) However, I will add: …resulting in a feeling of relative stability of the present gesture-class or gesture-class set.

As is common with many of Donatoni's solo works, there are no barlines or indications of meter. Instead, the music proceeds with a given tempo at some level of

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subdivision of a consistent pulse. *Omar*'s opening tempo indication is 144 eighth notes per minute and the music moves forward at a consistent duple division of that pulse throughout the first formal panel. This opening panel is built as a presentation of a two-part gesture-class set. The first part of this set is a gesture class comprised of a series of contrapuntal four-note chords, displaying a gesture of rigid contrary motion. These chords are written in groupings of 1, 2, or 3 consecutive attacks, and separated by a rest of 2, 3, or 4 sixteenth pulses (notated as eighth, dotted eighth, or quarter rests). The second part of this gesture-class set is comprised of a sustained three-note chord with a sharp attack, displaying a gesture of stasis coming out of an extreme event. Figure 1.1 shows the first statement of the gesture-class set that makes up the musical material for the opening panel.

Figure 1.1: An excerpt showing the gesture-class set used in constructing panel 1 of *Omar*.[4]

The total gesture-class set for this panel could be described in 'pseudo set notation' as *[rigid contrary motion, stasis coming out of an extreme event]*. In order for this set notation to be accurately descriptive, each of the bracketed elements must still remain faithful to the musical rules provided above.

Adding to the consistency of this panel's gestural content is the stasis of 'non-variable' elements surrounding Donatoni's simple gestural play. In other words, while the

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[4] See Franco Donatoni, *Omar: due pezzi per vibrafono* (Score), page 1, system 1.

number of chordal attacks of the sixteenth note gesture might change, the dynamic content and articulation scheme remain the same. Continuing through this panel, the same gesture-class set is repeated several times with each repetition exploring different aspects of its internal possibilities.

After six iterations of the opening gesture-class set, the music is interrupted by a new type of gesture, thus initiating a new panel. This panel is marked by a new tempo (eighth note = 104). The gestures that make up this panel are simpler than those of the previous panel as they only explore a single gesture-class, without combining distinct gesture-classes into sets. The gesture-class that constitutes this panel is comprised of variable-length runs of thirty-second notes, followed by an accented sixteenth note (sometimes a single note, sometimes a dyad). Each gesture within this panel is an inversion of the pitch contour of the previously stated gesture, thus creating a down – up – down – up pattern. Whenever a rest occurs, the pattern resets, starting again with a downward run of thirty-second notes. Figure 1.2 shows the opening section of the second panel with the inverting gesture-classes and the first rest interruption.

Figure 1.2: An excerpt showing the gesture-class of the opening of panel 2 of *Omar*.[5]

The subsequent four panels of this movement continue in largely the same way. Each panel displays different gesture-class properties with varying degrees of complexity

[5] See Franco Donatoni, *Omar: due pezzi per vibrafono* (Score), page. 1, system 4.

in terms of gesture-class and gesture-class set construction. In a sense, each panel is entirely self-contained and self-referential, and therefore allows for a clear and simple understanding of the form and texture of this music; although the very idea of gesture-class and gesture-class set analysis might not align with how Donatoni would have described his compositional method, as his notion of *figura* doesn't directly address the metaphorical ties of his music to motion. *Figura* (as described by Donatoni as well as his theorists) refers specifically, and only, to auto-referential musical bits, without taking into account any extramusical meanings that might aid in contextualizing them.

Gestural Flow in Cecil Taylor's *Indent*

Cecil Taylor reveals his musical ties to the notion of gesture clearly in his liner notes for his album *Unit Structures*, in which he states, "Rhythm is life space of time danced thru."[6] This poetic statement suggests how closely Taylor aligns the primary building blocks of music to aestheticized movement. In an interview with Chris Funkhouser, Taylor describes how he is always dancing while performing and does not understand types of music that do not integrate dance into the experience.[7] For Taylor, expression of physical gesture is key to the performance and understanding of his music.

Although Cecil Taylor's music seems to invite gestural investigation, formalized discussion of it presents several difficulties. While many theorists tend to describe Taylor's improvisations as being inherently gestural, such analyses often lack more than a cursory qualitative description of what is meant by gesture, in this context. Guerino B. Mazzola and Paul B. Cherlin, in their book *Flow, Gesture and Spaces in Free Jazz*, as

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[6] See Cecil Taylor, *Unit Structures* (Liner Notes).
[7] See Chris Funkhouser, Being Matter Ignited..., an interview with Cecil Taylor

well as Kaja Draksler in her paper, *Cecil Taylor: Life As… Structure within a Free Improvisation*, both frequently invoke gesture in Taylor's music, usually in drawing on fairly ambiguous notions of the term. As Taylor's music exists primarily in the realm of improvisation outside of clearly-defined idioms, a discussion of formal or compositional procedures might seem somewhat antithetical to the music's conception. However, in-depth investigation into Taylor's music demonstrates, as Draksler clearly points out in her thesis, that there are almost certainly compositional procedures at work, or at the very least, basic structural tendencies.

It is important to state that Cecil Taylor would likely be reluctant to align himself with an analysis of his musical structures. Taylor's discussion of his own improvisation reveals that he contextualizes his musical construction primarily with the blues and other vernacular traditions, and resists strong associations with the more academic reductive approach that works so well in papers and theses. A.B. Spellman's book, *Four Jazz Lives*, describes Taylor's desires regarding how his music should be heard as "wish[ing] people would listen to the essentially blues content of his music instead of to whatever forms and devices he may have brought over from the conservatory." (Spellman 28) In Taylor's own writing, in the pseudo-prosaic liner notes for his album, *Unit Structures*, he writes:

> Reactive occult, in action unknowable–detached–
> rationalization of inaction and detachment mathematical
> series, permutation and row- underlying premise = idea
> precedes experience.[8]

This quote seems to suggest that academic rationalization displays a series of "meaningless ontologies"[9] in place of truly experiencing his music. Bearing these

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[8] See Cecil Taylor, *Unit Structures* (Liner Notes).
[9] See Guerino B. Mazzola and Paul B. Cherlin, *Flow, Gesture, and Spaces in Free Jazz: Towards a Theory of Collaboration*, especially Chapter 6.1 "Cecil Taylor: *Unit Structures*".

statements of analytical resistance in mind, I offer my analysis of his work not as an imposition of a theoretical model, but rather as a possible option for understanding the construction of Taylor's improvisations through the lens of my proposed definition of gesture-class.

For this analysis, I will use Cecil Taylor's solo improvisation, entitled *Indent*, recorded live at Antioch College in 1973. This improvisation moves beyond the idea of the simple gesture-class juxtaposition shown in Donatoni's music. Instead, a more complex set of gesture-class relationships is developed through Taylor's use of gestural flow as well as various causal events.

For the purposes of this paper, I will use the following definition to describe gestural flow: **Gestural Flow -** *the seamless transition, blend, or 'crossfade' from one gesture-class to another.*

Guerino and Mazzola, have described in detail the psychological and conscious notions of flow in various forms of free jazz, both solo and collaborative. While I have drawn on some of the ideas that they present, I am not aligning my definition too closely with theirs, due to the psychological and thermodynamic implications that I do not wish to suggest in my analysis of Taylor's music.[10]

Where Donatoni's music exists as a series of panels that rarely bear relation to one another, Taylor's music is built as a series of ever-changing relationships with a constant multitude of directional possibilities. Each component of a gesture is a possible seed, and if chosen may form the foundation of its own gesture-class or gesture-class set.

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[10] See Guerino B. Mazzola and Paul B. Cherlin, especially Chapter 10 "What is Flow?".

Of course, Taylor never makes use of all of the possible seeds present in his music, but rather constantly and selectively develops seeds into gesture-classes and extracting new seeds from those gesture-classes in an ongoing process. Thus, his music is based on an immediate and continuous awareness of a multitude of possibilities at any juncture and the decisions made regarding those possibilities. As I will discuss in my analysis of Cecil Taylor's *Indent*, new gesture-classes presented throughout his improvisation are often built on seeds presented in earlier gesture-classes.

Indent is a three-part improvisation, separated into what Taylor calls 'layers'. The first layer is an improvisation lasting about 13:40, the second layer lasting about another 13:40, and the final layer lasting about 17:25. The opening of the first layer (Figure 2.1) sets up a two-part gesture-class set not unlike Donatoni's *Omar*, but with clear harmonic and rhythmic ties to American Black music traditions, rather than the Euro-American concert traditions of pitch-class sets and rigid rhythmic grids seen in *Omar*. It is interesting to compare Taylor's rhythmic structures to Donatoni's. Both aim to destroy notions of bar and meter in their music, but do so in fairly distinct ways. Where Donatoni essentially quantizes his rhythms to an unchanging grid of eighth or sixteenth notes, Taylor's rhythms are more flexible. In their book, *Flow, Gesture, and Spaces in Free Jazz: Towards a Theory of Collaboration*, Guerino B. Mazzola and Paul B. Cherlin describe Taylor's relationship to beat as "get[ting] more out of the beat than the beat, to create sounds, not just regularly scattered time points." (Mazzola and Cherlin 53) This idea of sounds versus time points is key to understanding how Cecil Taylor approaches rhythm in his improvisation. The complex ebb and flow of rhythm in his performance

works to draw the listener into the sounds of each musical event and gesture-class, rather than hearing the constant pulse-grid presented in the music of Donatoni.

The opening gesture-class set of *Indent*, shown in Figure 2.1, is made up of staccato octaves elaborating a falling fourth (from B – F#), alternating in register from mid-low to low, followed by a high sustained octave on F#, the central note of the current harmonic mode. Unlike Donatoni, Taylor has enormous variation in his articulation of these octave figures leaving the consistency of gesture to depend on his faithfulness to maintaining the given mode, octave intervals, and general pitch contour of his gestures.

Figure 2.1: A transcribed excerpt showing the opening gesture-class set of *Indent*. Durations and rhythms are not notated exactly, but grouped according to phrasing.

A 'pseudo set notation' description of the opening gesture-class shows: *[soft and intense downward motion, high stasis]*. It is interesting that Taylor and Donatoni both begin their works with a similar dualism built between intense motion around the registers of an instrument, followed by stasis. In his book, *Free Jazz*, Ekkehard Jost describes this common gestural juxtaposition of Taylor's as, "compensated stagnating motion [with] kinetic impulses...based on the rise and fall of energy." (Jost 70-71)

After Taylor's opening gesture-class set has been explored for about forty seconds, enough time to establish this gestural area's being and essence without exhausting its transformational possibilities, he introduces the seed for a new gesture-class to take over. This seed is presented as a dissonant chordal alternation based on combinations of minor thirds and tritones (an exact split of the previously featured

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octaves). Figure 2.2 shows the chordal alternations of the new gesture-class,

approximating the pitch content, which varies widely throughout this section.

Figure 2.2: A transcribed excerpt showing the dissonant chordal alternations of the
second gesture-class of *Indent*.

Over the next thirty seconds, the dissonant alternations become increasingly prevalent

until the octave gestures are no longer present. This is a prime example of the idea of

gestural flow from one gesture-class to another. After about 20 seconds of exploration of

the world of dissonant alternations, the octaves resurface, but, having changed their pitch

contour and overall gestural content, they are no longer the expansive staccato octave

runs from the beginning. They now focus on alternation between two or three pitches,

being irreversibly changed by the dissonant chordal alternation gestures that initially

interrupted them.

The next major change is a new gesture-class made up of repeated chords, starting

in a single register and then being occasionally displaced by one or several octaves. In a

sense, these displacements could be regarded as an alteration of the original octave

gestures. As the octave gestures present a single gesture-class at a time, the repeated note

gesture, are collapsed versions of this original gesture-class. Perhaps the dissonant

alternation gesture exploited some seed within the opening gesture-class set that

demanded exploration once introduced, to bring back the notion of constant gestural flow

and development of seeded material.

This series of linear explorations and juxtaposition of gesture-classes is the continual trajectory of each of the three layers of *Indent,* as well as of many of other solo improvisations by Taylor. Jost uses the phrase *motivic chain associations*[11] to describe a similar improvisational technique in the music of Ornette Coleman. This phrase neatly describes the gestural unfolding of Taylor's improvisation as a linear chain of self-reflective, forward-looking gestural areas.

While this type of gestural analysis might be antithetical to Taylor's own view of his music, he often describes his practice as being inextricably tied to dance, with many of his favorite musical experiences involving playing with dancers in interactive improvisation, where physical and musical gestures are allowed to interact directly. This work alongside dancers illustrates Taylor's inherent understanding of the marriage between physical and musical gesture.

Ties between physical and musical gesture with the 'Augmented Violin' in Mari Kimura's *Clone Barcarolle*

Mari Kimura, improvising composer-violinist, has undertaken several years of extensive research regarding the physical gestures involved in the creation of music, specifically with respect to the violin. In 2008, in conjunction with the Realtime Musical Interaction Team at IRCAM, she began research and development of a hardware system designed to sense and follow significant gestural information in the bowing of the violin, without altering the ways in which the instrument is classically played. This system, know as the 'Augmented Violin', is made of a single glove worn on the bowing hand of the performer. Three primary components of this glove allow it to track and output

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[11] See Ekkehard Jost, *Free Jazz*, especially page 49.

gestural data: a wireless 3D accelerometer, three gyroscope sensors, and a battery for

power.[12] The glove is specifically designed to transmit information wirelessly in order to

remove the performance inhibitions that come with being tethered to wires and cables. In

the article, *Extracting Human Expression For Interactive Composition with the*

Augmented Violin, Kimura describes her gestural goals as being:

> …designed upon the concept of movement qualities,
> where the goal is not to achieve a particular gesture or
> action but rather a way of performing it, i.e. a quality.
> We believe such an approach to be promising as it can
> provide for a higher level of abstraction in interaction
> design, while still keeping a sense of mediation.
> (Kimura, Rasamimanana , and Bevilacqua 2)

This idea of abstraction from specific gestures into descriptions of ways to play those

gestures ties closely to my notion of gesture-class as a formal structure. One work by

Kimura that illustrates this abstraction quite clearly is *Clone Barcarolle* (2009), one of

her early pieces for acoustic violin and 'Augmented Violin'. In *Clone Barcarolle*,

gestural data captured by the sensors in the glove is sent and stored in the program

Max/MSP in order to recall and develop variation as the composition unfolds. This

gestural data is related to specific classes of gesture in the playing of the violin. The

'Augmented Violin' system also has a method for detecting the ending of a gesture using

a programmed "ending detector", which analyzes "the combination of physical and

musical gestures: right hand movement together with sound and musical context for the

violin." (Kimura, Rasamimanana , and Bevilacqua 2)

While the entirety of the music of *Clone Barcarolle* does not fit as neatly into

gesture-class analysis as do Franco Donatoni's or Cecil Taylor's music, Kimura's piece

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[12] See Mari Kimura, Nicolas Rasamimanana, and Frédéric Bevilacqua, *Extracting human expression for interactive composition with the augmented violin*, especially page 2.

very consciously deals with classification of different types of bow movements in order to create different musical profiles based on a single set of gestural data.

    Clone Barcarolle begins with a live violin playing a rising four-note motive, shown in Figure 3.1, that spans the entire open-note range of the instrument, at a moderate tempo and dynamic. This figure acts as a sort of calibration for the computer and gives a general situation as a starting point, with a great number of transformational possibilities. The fact that the figure includes a full bow motion over all four strings of the violin, implicit within which is an open-string harmony of fifth relationships (G – D – A – E), gives a great number of gestural and harmonic avenues to explore throughout the piece.

Figure 3.1: The opening motive, which is stored and 'cloned', or classified within Max/MSP.[13]

The opening figure is analyzed for audio content, described by Kimura as its *energy profile*,[14] as well as gestural information (the data tracked by sensors in the glove) and stored in a buffer in Max/MSP. The compilation of all of the stored gestural data in a given *energy profile* becomes the content used by Max/MSP to develop 'clones', as in the piece's title, throughout the duration of the work. In my analysis, I will replace the term 'clone' with gesture-class. These gesture-classes, stored in Max/MSP, can be transformed and modified in various ways while retaining their original audio and gestural profiles.

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[13] See Mari Kimura. *Clone Barcarolle* (Score), page 1.

[14] See Mari Kimura, Nicolas Rasamimanana, and Frédéric Bevilacqua, especially page 2.

Each permutation of this gesture-class (derived from the motive in figure 3.1) is triggered by physical gestural information read from the bowing hand of the performer. For instance, different rhythmic profiles are derived from moving the bowing hand along the trajectory of the opening gesture, but at different rates (shown in notation in Figure 3.2)

Figure 3.2: Different rhythmic permutations of the opening gesture-class, driven by gestural variance in the bowing arm of the violinist.[15]

Throughout the duration of this work, the computer continues to derive permutations from the original gesture-class only, while the live violin departs from the original musical material drastically.

What is unique about Kimura's treatment of gestural variation is that she has programmed the computer to deal with creating the gestural variations while she can simultaneously play something entirely different. Further, since the computer is tracking the motion of her bowing hand, she does not even have to be playing for the computer to be developing variation based on data it is reading from her glove. Often within *Clone Barcarolle*, the score will indicate trade-off between the computer performing a new permutation of the original gesture-class (Figure 3.1) and the live performer introducing some sort of new musical material. This "back and forth" structure creates an interesting dialogue about what types of musical information can be communicated and derived

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[15] See Mari Kimura. *Clone Barcarolle* (Score), page 1. Edited by Anthony Caulkins for this example.

through gesture (the computer part) and what types of information rely on composition or intuition (the live performance part).

Conclusion

While none of the artists described in this paper has aligned themself with any particular notion of gesture classification, nor a formal application of gesture in music such as the one that I have proposed, each of their compositional styles illustrates a certain connection to the concept of gesture. I do not propose that my brief gesture-class analyses of the music of Franco Donatoni, Cecil Taylor, and Mari Kimura are comprehensive. However, I do propose a new lens with which to view the composition and construction of their music so as to derive certain principles that one can apply to composition or improvisation. Through the process of abstracting gesture-classes and gesture-class sets from various types of music, I hope to begin to provide vocabulary with which to describe music that can be seen as gestural in conception or construction, as well as insight into the possibilities for new forms of composition based on exploration of gesture as a formal musical element.

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