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Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA
SANTA CRUZ

PERSISTENCE, RESISTANCE, RESONANCE

A dissertation submitted in partial satisfaction

of the requirements for the degree of

DOCTOR OF MUSICAL ARTS

in

MUSIC COMPOSITION

by

Maayan Tsadka

March 2015

The Dissertation of Maayan Tsadka is
approved:

Professor Hi Kyung Kim, chair

Professor Larry Polansky

Professor Amy C. Beal

Tyrus Miller
Vice Provost and Dean of Graduate Studies

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Persistence, Resistance, Resonance

Maayan Tsadka

Abstract

Sound cannot travel in a vacuum, physically or socially. The ways in which sound operates are a result of acoustic properties, and the ways by which it is considered to be music are a result of social constructions. Therefore, music is always political, regardless of its content: the way it is performed and composed; the choice of instrumentation, notation, tuning; the medium of its distribution; its inherent hierarchy and power dynamics, and more. My compositional praxis makes me less interested in defining a relationship between music and politics than I am in erasing—or at least blurring—the borders between them.

In this paper I discuss the aesthetics of resonance and echo in their metaphorical, physical, social, and musical manifestations. Also discussed is a political aesthetic of resonance, manifested through protest chants. I transcribe and analyze common protest chants from around the world, categorizing and unifying them as universal crowd-mobilizing rhythms.

These ideas are explored musically in three pieces. *Sumud: Rhetoric of Resistance in Three Movements*, for two pianos and two percussion players, is a musical interpretation of the political/social concept of *sumud*, an Arabic word that literally means “steadfastness” and represents Palestinian non-violent resistance. The piece is

based on common protest rhythms and uses the acoustic properties inherent to the instruments. The second piece, *Three Piano Studies*, extends some of the musical ideas and techniques used in *Sumud*, and explores the acoustic properties and resonance of the piano. The final set of pieces is part of my *Critical Mess Music Project*. These are site-specific musical works that attempt to blur the boundaries between audience, performers and composer, in part by including people without traditional musical training in the process of music making. These pieces use the natural structure and resonance of an environment, in this case, locations on the UCSC campus, and offer an active form of musical consumption and experience. The three pieces draw lines connecting different aspects of persistence, resistance, and resonance.

Acknowledgments

My deepest gratitude and appreciation to many people who made this possible:

To all who participated in *Critical Mess Music Project* events over the past few years and joined me for those musical experiments. To the performers of *Sumud*: yarn/wire ensemble for the first performance, and to Kumi Uyeda, Michael Seth Orland, Ward Spangler and Aiden McKee for the second performance. To Zack Myers for the performance of the piano studies, and to David Dunn for recording them.

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Part I: Compositions

Sumud

Three Piano Studies

Critical Mess Music Project

S U M U D

rhetoric of resistance in three movements

for two pianos and two percussion players

2013/14

maayan tsadka

Instrumentation

Two grand pianos, preferably amplified if played in a large hall.

Percussion Instruments:

Suspended Cymbal (2) (anywhere between 14"-24", two similar ones)

Triangle (2)

Timpani (4)

Orchestral chimes (1)

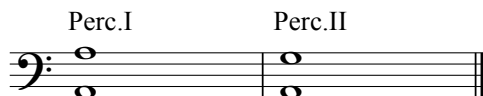
Crotales (1)

Felt and wood mallets

Perc. Player I: 1 sus, cymbal/ 1 triangle/ 2 timpani/ chimes

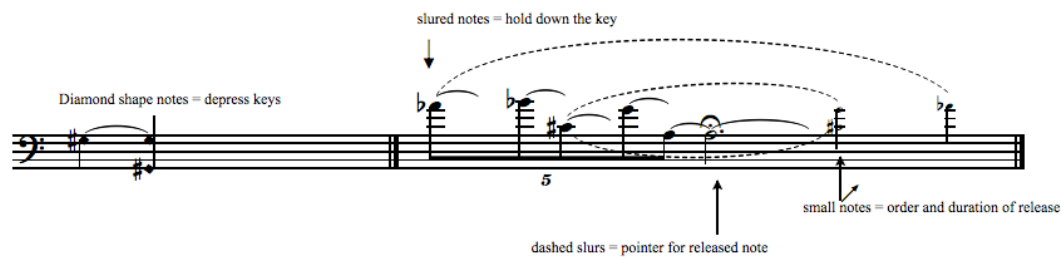
Perc. Player II: 1 sus cymbal/ 1 triangle/ 2 timpani/ crotales

Timpani Tuning:



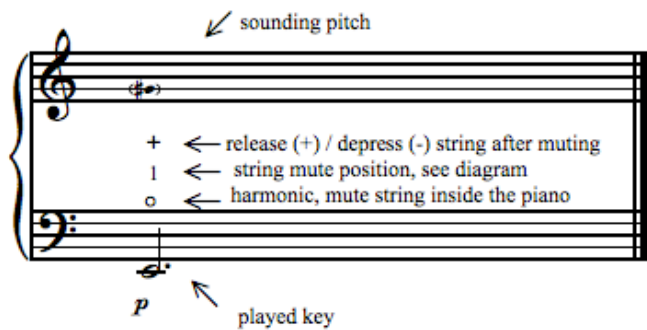
Notation and Performance Instructions

Piano



Ped. _____

U.C = una corda pedal



Percussion

Sus. cymbal

' - choke the cymbal immediately after striking; don't mute completely; with each recurrent hit, mute in a slightly different location, to evoke different resonance.

Timpani

C - strike center of head

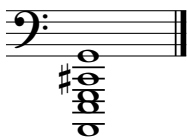
R - strike head near the rim

N - normal striking position on head

Piano Preparation

For each of the following strings mark numbers from 1-0 inside the piano along the strings. The numbers correspond to specific harmonics specified in the list below, and represented in the score by those numbers.

Prepared keys: A0, E1, G1, C#2, G2



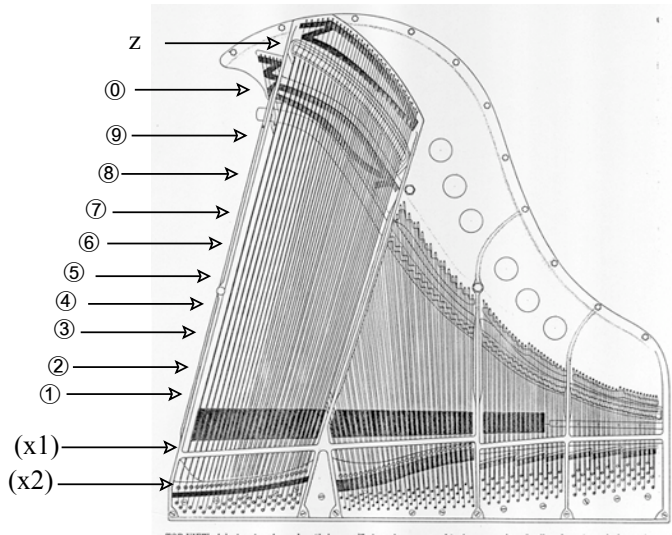
For each of the above notes, mark the following harmonics using the given numbers (specified notes on staff below):

(1) two octaves+M3 higher, 5th partial, 1/5 of the string

(2) two octaves+m7 higher, 7th partial, 1/7 of the string

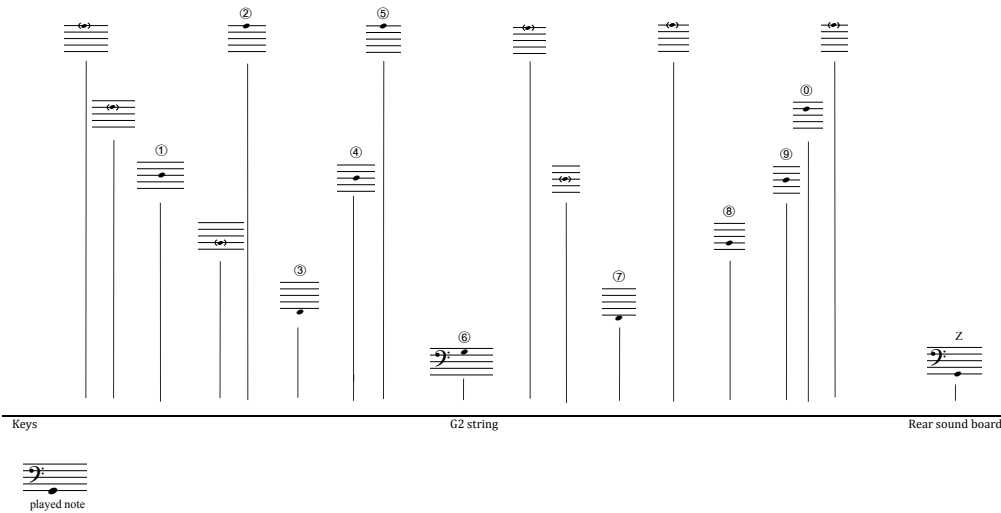
(3) one octave+P5th higher, 3rd partial, 1/3 of the string

- (4) two octaves+M3 higher, 5th partial, 1/5 of the string
- (5) two octaves+m7 higher, 7th partial, 1/7 of the string
- (6) one octave higher, 2nd partial, 1/2 of the string
- (7) one octave+P5th higher, 3rd partial, 1/3 of the string
- (8) two octaves higher, 4th partial, 1/4 of the string
- (9) two octaves+M3 higher, 5th partial, 1/5 of the string
- (0) two octaves+P5th higher, 6th partial, 1/6 of the string
- (Z) far end of the string (similar to fundamental) 1st partial
- (x1) behind the damper, close to the keys
- (x2) close end of string to the keys



String Muting Positions: approximate sounding partials

Example for approximate sounding partials for G2 string up to the 7th harmonic. Notes in parenthesis indicate nodes along the string not to be marked. All notes to be read in treble clef unless specified otherwise.



String Glissando

Only in the 2nd movement. To be played by the percussion players.

Represented in the score by numbers with a wavy glissando line, ascending or descending.

Ascending glissando = towards the rear soundboard of the piano.

Descending glissando = towards the keyboard.

A double-head arrow between two numbers indicate muting the string between the specified harmonics.



SUMUD

maayan tsadka

I

♩=50

Piano I

p

Piano II

mf

mp

9

Piano I

f *mp*

Piano II

mf *mp*

15

Piano I

f

Piano II

mp *f*

24

Piano I

mp *mp* *mf* *mf*

+ 1

Ped.

Piano II

mp *mp* *f*

+ 4

mf

31

Percussion I

mute E string on piano I, position 1* [mm.32-37]

1

Piano I

p *p* * 1 (Perc I)

sim.

mute E string piano II, position 4* [mm.31-37]

4

Percussion II

4

Piano II

* 4 (Perc II) *p*

sim.

* The string harmonics in this section are muted by Perc. player. [mm.31-37].

34

Percussion I

A single staff for Percussion I, featuring a fermata at the beginning and a long, thin horizontal line extending across the entire measure.

Piano I

A grand staff for Piano I, consisting of a treble clef staff with a key signature of one sharp (F#) and a bass clef staff. Both staves contain dense, repetitive rhythmic patterns of eighth notes.

Percussion II

A single staff for Percussion II, featuring a fermata at the beginning and a long, thin horizontal line extending across the entire measure.

Piano II

A grand staff for Piano II, consisting of a treble clef staff with a key signature of one sharp (F#) and a bass clef staff. The treble staff contains a melodic line of quarter notes, while the bass staff contains a line of quarter notes.



35

Percussion I

A single staff for Percussion I, featuring a fermata at the beginning and a long, thin horizontal line extending across the entire measure.

Piano I

A grand staff for Piano I, consisting of a treble clef staff with a key signature of one sharp (F#) and a bass clef staff. Both staves contain dense, repetitive rhythmic patterns of eighth notes. The word "cresc." is written below the bass staff.

Percussion II

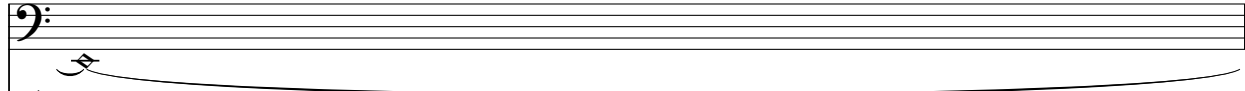
A single staff for Percussion II, featuring a fermata at the beginning and a long, thin horizontal line extending across the entire measure.

Piano II

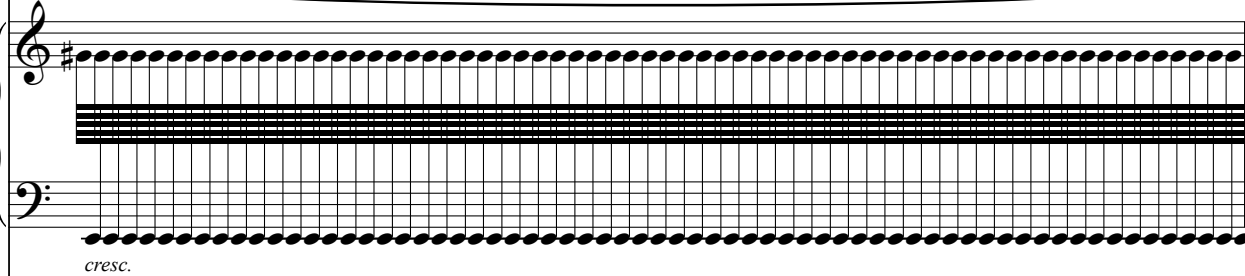
A grand staff for Piano II, consisting of a treble clef staff with a key signature of one sharp (F#) and a bass clef staff. Both staves contain dense, repetitive rhythmic patterns of eighth notes.

36

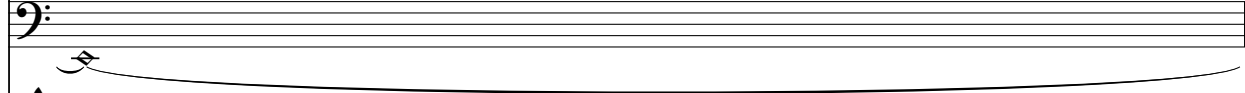
Percussion I



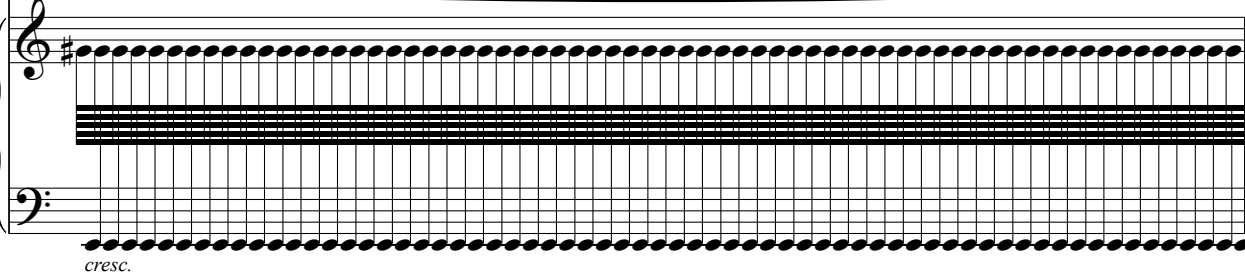
Piano I



Percussion II

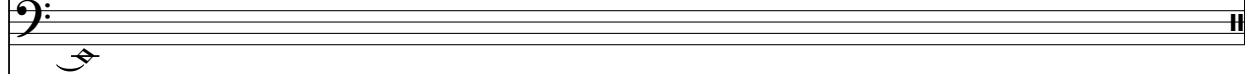


Piano II

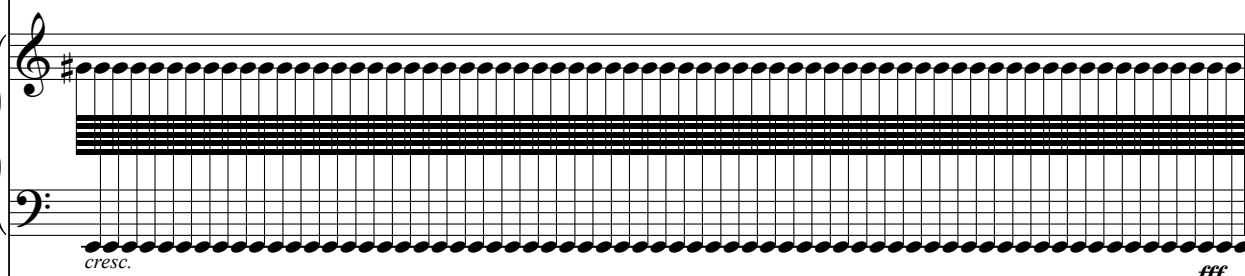


37

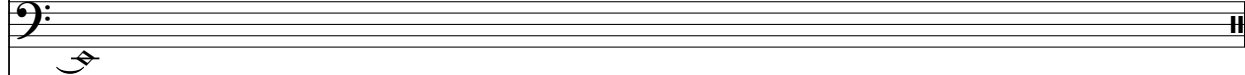
Percussion I



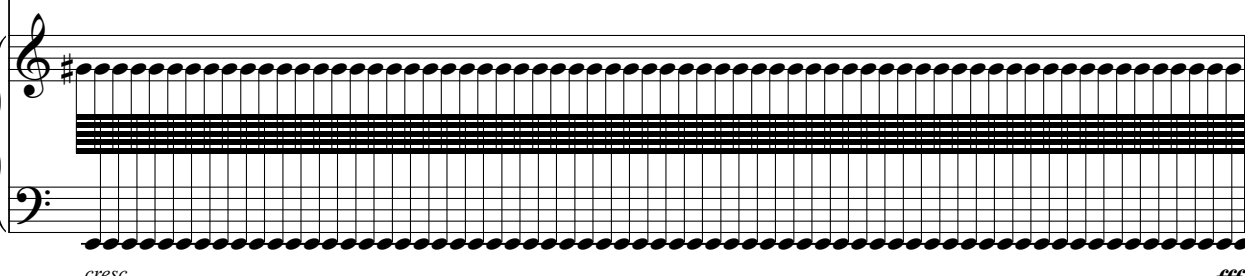
Piano I



Percussion II



Piano II



* optional: mute string by perc. player rather pianist
(mm.41-44)

38

Percussion I

Piano I

Percussion II

Piano II

fff

mp

p

x1 -----> x2

8^{vb}

8^{vb}

42

Percussion I

Piano I

Percussion II

Piano II

app. 12' sec.

cresc.

(8)

x1 -----> x2

8^{vb}

8^{vb}

43

Piano I

x2
(end of string, close to the keys) +
(open)

fff

(8)

Piano II

x2
(end of string, close to the keys) +
(open)

ppp p

fff

(8)

≡

50

Percussion I

Crotales

mp

Piano I

f ff

Ped.

Piano II

f sfz

Ped.

* $\text{♩} = 80$ *hold slurred notes

Piano I

Piano II

f 7 7 6

Ped.

Piano I

Piano II

hold Ab

*alternating release between pianos

f 5

Piano I

Piano II

mf 3

mf 3

from this point on no slurs are used to indicate released notes. you get the idea.

Piano I

Piano II

mf 3

p Ped.

f

* Mm. 58-85 are not metered. The tempo is more or less rubato, bar lines are only for synchronicity. Listen to the released notes, add fermatas where you find it appropriate.

67

Piano II

mf 3

p

Ped. _____

70

Piano II

ff

71

Piano I

f

Piano II

p

75

Piano I

mp

3

3

p

Ped. _____

Piano II

mp

3

3



77

Percussion I

Crotales

pp

pp

ff

Piano I

79

Piano I

mp

Piano II

mf

f

82

Piano I

ff

mf

f

3

Piano II

ff

mf

f

3

85

Piano I

ff

ff

♩=50

Alternate releasing between pianos

Piano II

ff

mp

+
4
o

♩=50

88

Piano I

f

f

+
o

Piano II

f

f

+
o

95 Chimes

Percussion I *mf*

Piano I *mf* (8)

Percussion II

Piano II (8)

97 *mf*

Piano II *mf*

♩=50 diamond shape notes=key held down

98 *poco dim.*

Piano II *poco dim.*

99 *f*

Piano II *f*

100

Piano II

101

Piano I *f* 5 5 5 5 5 5 5 5 5 5 5 5

Piano II

102

Piano I 5 5 5

Piano II

103 **Rubato**

Piano I

Piano II *alternate release between hands 5 5 5 5 5 5 5 5 5 5 5 5

104

Piano II 5 5 5

105

Piano I *alternate release between hands 5 5 5 5 5 5 5 5 5 5 5 5

Piano II

Sus. cymbal
choke immediately after hitting, but let it resonate. mute cymbal at a different spot each time

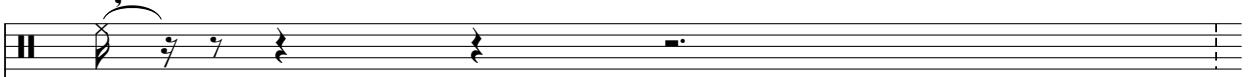
106

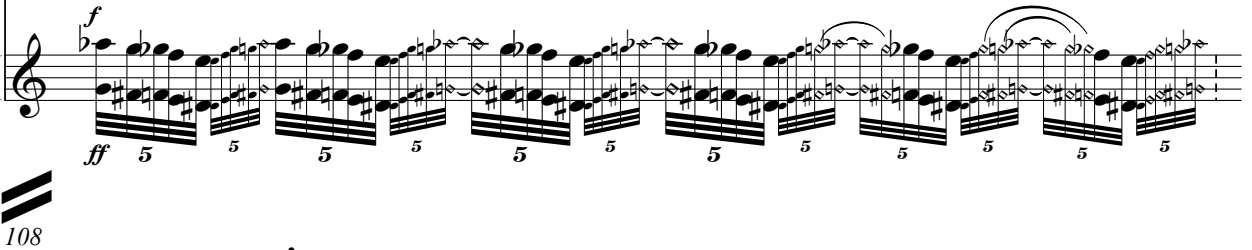
Percussion I 

Piano I 

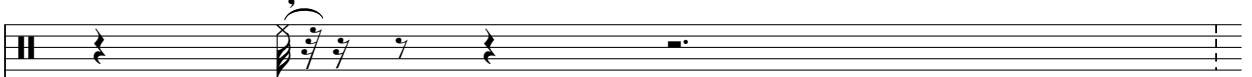
Sus. cymbal
choke immediately after hitting, but let it resonate. mute cymbal at a different spot each time

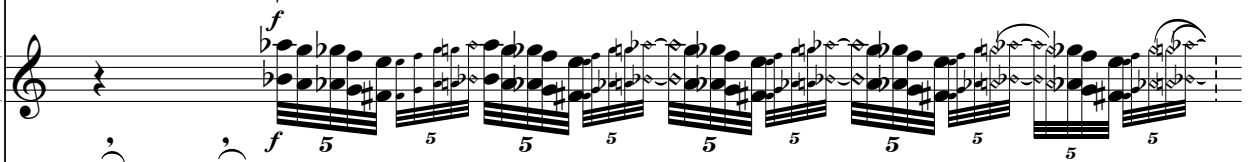
107

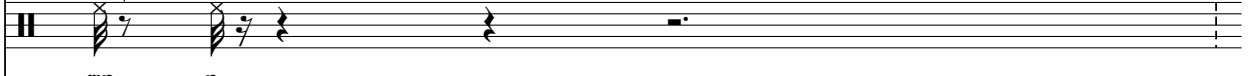
Percussion II 

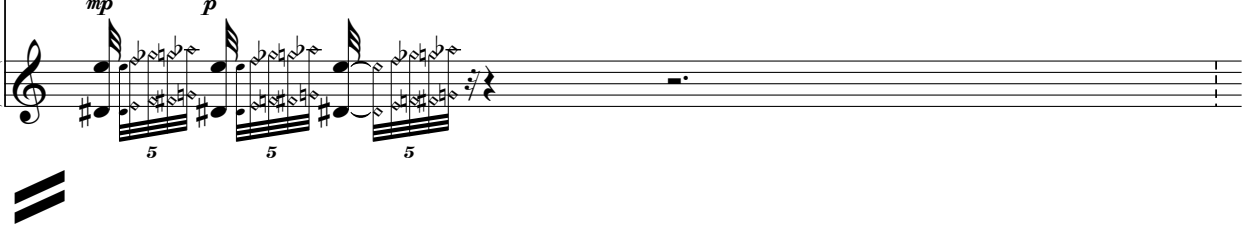
Piano II 

108

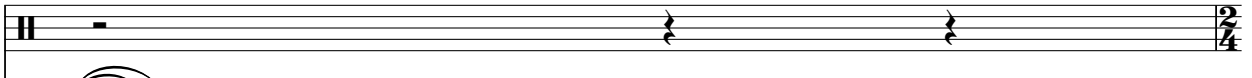
Percussion I 


Piano I 

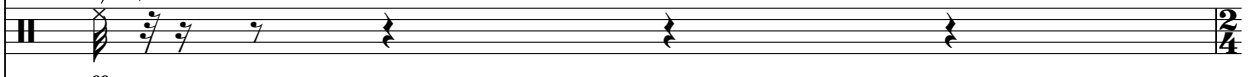
Percussion II 


Piano II 

109

Percussion I 

Piano I 

Percussion II 

Piano II 

110

Percussion I

Piano I

Percussion II

Piano II

ff

ff

mp *p*

112

Percussion I

Piano I

Percussion II

Piano II

ff

ff

ff

113

Percussion I

Piano I

Percussion II

Piano II

mf

f

115

Percussion I

Piano I

Percussion II

Piano II

fff *alternate release between hands

f *fff*

fff *f*

116

Percussion I

Piano I

Percussion II

Piano II

f

$\text{♩} = 50$

121

Piano I

Piano II

f *fff*

130

Chimes

Percussion I

Piano I

Piano II

mf *mp* *8vb*

1 simile

135

Percussion I

Piano I

Piano II

mp *mp*

Chimes

139

Percussion I

Percussion II

Piano I

Piano II

142

Piano II

ff

147

Piano II

ff

151

Piano I

Piano II

ff

154 *fff*

Piano I

8^{vb}

fff

Piano II

8^{vb}

156

Piano I

8^{vb}

Piano II

8^{vb}

157

Piano I

(8).....

Piano II

(8).....

(low A string only)

7 ③ ③ ③ ③ ③ -----> ⑤ ⑤ ⑤ ↔ ⑥

Percussion I

Piano I

Percussion II

Piano II

mp

pp

(low A string only)

8^{vb}

8^{vb}



9 ⑥ ↔ ⑦ *sim.* -----> ⑦ -----> ⑧ ⑧ ⑧

Percussion I

Piano I

Percussion II

Piano II

poco cresc.

(8)

(8)

11

Percussion I

Piano I

Percussion II

Piano II

cresc. *ff*

8^{vb}

8 ↔ 9 8 ↔ 9

*same position applies to both strings (on E string) (A string)

9 ↔ 10 9 4 9 4 4 ↔ 3 3 3 ↔ 2 1

8^{vb} 8^{vb} 15^{vb}

cresc. *f*

8^{vb}



15

Percussion I

Piano I

Percussion II

Piano II

1 ↔ 2 1 ↔ 2 2 ↔ 3 2 (G string) 2 3 3 (A string) 3 6 ↔ 7 7

15^{vb}

(8)

(C# string) (A + C# strings) (A + E strings) 6 (E string) 3 (A string)

4 4 1 ↔ 2 2 ↔ 3 3 ↔ 4 3 3 3 ↔ 4

ff

(8)

(A + E strings) (E + C# strings, A open) (A string, rear soundboard)

20

Percussion I

Piano I

Percussion II

(A + G strings) (G + G' strings, A open)

(A string, rear soundboard)

Piano II



23

Percussion I

Piano I

subito pp

Percussion II

Piano II

subito pp

25

Percussion I ^⑥

ff

Piano I

Percussion II ^①

ff

Piano II

(8)



27

Percussion I ^①

Piano I

Percussion II

Piano II

(8)

①

(A + G strings)

29

Percussion I

Piano I

Percussion II

Piano II

8^{vb}

X1

X2

(A + E strings)



32

Percussion I

Piano I

Percussion II

Piano II

(G + C# strings)

(E + G' strings)

ppp

ff

8^{vb}

8^{vb}

free ascending/descending glissando (open strings are also possible)

38

Percussion I

Piano I

Percussion II

Piano II

free ascending/descending glissando (open strings are also possible)

(8)

ff

Ped.



♩=80

45

Piano I

Piano II

ff

15^{ma}

15^{ma}

ff

(15)

46

Piano I

Piano II

15^{ma}

47

Piano I

Piano II

15^{ma}

Ped. _____

una corda

48

Piano I

Piano II

15^{ma}

49

Piano I

Piano II

15^{ma}

Ped. _____

una corda

triangle

50

Percussion I

pp

Piano I

15^{ma}

Piano II

15^{ma}

51

Percussion I

ff

Piano I

(15)

Percussion II

crotales

pp

Piano II

(15)

52

Percussion I

Piano I

Percussion II

Piano II

15^{ma}

ff

15^{ma}

53

Piano I

Percussion II

Piano II

(15)

(15)

54

Piano I

Piano II

15^{ma}

Ped.
una corda

15^{ma}

Ped.
una corda

55 *15^{ma}*

Piano I

Piano II

15^{ma}

Detailed description: This system covers measures 55 and 56. Piano I plays a continuous sixteenth-note pattern, with a dashed line above the staff labeled '15^{ma}'. Piano II plays a melody consisting of quarter notes and dotted quarter notes, also with a dashed line above the staff labeled '15^{ma}'. A double bar line is located below the Piano II staff.

56 (*15*)

Piano I

Piano II

(15)

Detailed description: This system covers measures 56 and 57. Piano I continues with the sixteenth-note texture, with a dashed line above the staff labeled '(15)'. Piano II continues with the dotted melody, with a dashed line above the staff labeled '(15)'. A double bar line is located below the Piano II staff.

57 (*15*)

Piano I

Ped.
una corda

Piano II

15^{ma}

Detailed description: This system covers measures 57 and 58. Piano I continues with the sixteenth-note texture, with a dashed line above the staff labeled '(15)'. Piano II continues with the dotted melody, with a dashed line above the staff labeled '15^{ma}'. A double bar line is located below the Piano II staff. The instruction 'Ped. una corda' is written below the Piano I staff.

58 (*15*)

Piano I

Piano II

(15)

Detailed description: This system covers measures 58 and 59. Piano I continues with the sixteenth-note texture, with a dashed line above the staff labeled '(15)'. Piano II continues with the dotted melody, with a dashed line above the staff labeled '(15)'. A double bar line is located below the Piano II staff.

59 (15)

Piano I

Piano II

15^{ma}

60 (15)

Piano I

Piano II

(15)

61 15^{ma}

Piano I

Piano II

15^{ma}

62 (15)

Piano I

Piano II

(15)

63 15^{ma}

Piano I

Piano II

15^{ma}

SUMUD

III

Regular timpani mallets

$\text{♩} = 60$

Musical score for Percussion I, Percussion II, Piano I, and Piano II. The score is in 4/4 time and includes dynamic markings, articulation, and performance instructions.

Measure 1-6:

- Perc I Timpani:** Notes with dynamics *sfz*, *sfz*, *sfz*, *sfz*, *sfz*, *sfz*, *f*. Mallets: N, R, C, N, R, C.
- Perc II Timpani:** Rests in measures 1-3, then notes with dynamics *sfz*, *f*. Mallets: N, R.

Measure 7-12:

- Perc I Timpani:** Notes with dynamic *pp*. Mallets: R, C, N.
- Perc II Timpani:** Rests in measures 7-8, then notes with dynamic *p*. Mallets: R, C.

Measure 13-18:

- Perc I Timpani:** Notes with dynamic *f* and *accel.*. Mallets: N, R.
- Perc II Timpani:** Notes with dynamic *f* and *accel.*. Mallets: N, R.
- Piano I:** Notes with dynamic *f* and *accel.*.
- Piano II:** Notes with dynamic *ff* and *8^{vb}*.

18 $\text{♩} = 120$

Perc I Timpani

Perc II Timpani

Piano I

Piano II

fff

f

fff

fff

(8)

23

Perc I Timpani

Perc II Timpani

Piano I

Piano II

p

ff

f

mf

mf

35

Perc I Timpani

Perc II Timpani

Piano I

Piano II

8^{vb}

p

(R)

(N)

40

Perc I Timpani

Perc II Timpani

Piano II

8^{vb}

ppp

(N)

(R)

p

ppp

mute string, percussive sound

45

Perc I Timpani

Perc II Timpani

Piano II

8^{vb}

mf

change to wood sticks

open

pp

mf

pp

mf

change to wood sticks

50

Perc I Timpani

Perc II Timpani

Piano I

Piano II

ff

ff

8^{vb}

ff

8^{vb}

ff

54

Perc I Timpani

Perc II Timpani

Piano I

Piano II

C

R

N

(8)

(8)

58

Perc I Timpani

Perc II Timpani

Piano I

Piano II

8^{va}

ff

8^{vb}

8^{vb}

ff

62

Perc I Timpani

Perc II Timpani

Piano I

Piano II

f

f

f

ff

f

f

8^{vb}

65

Perc I Timpani

Perc II Timpani

Piano I

Piano II

ff

ff

ff

8^{vb}

68 **(N)**

Perc I Timpani

Perc II Timpani

Piano I

Piano II

(8) *fff*



72

Perc I Timpani

Perc II Timpani

Piano I

Piano II

(C) **(R)** **(C)** **(R)** **(N)**

sfz *sfz* *sfz* *sfz* *sfz*

sfz *mp* *sfz* *sfz* *sfz*

8^{vb} *sfz*

(8) *8^{vb}* *mp* *sfz* *sfz*

Three Piano Studies

PIANO STUDY NO. 1

Preferably played on an amplified piano, or in a small room

Performance Notes



chromatic scale; play as fast as possible.



silently depressed keys.

hold down all depressed keys until the next transition/rest.



rit.



accel.

Fermatas (approximate durations)

△ short (2-3 sec.)

○ medium (4-7 sec.)

◻ long (7-10 sec.)



very short (1 sec.)



(2-3 sec.)

Margan Tsalka
Santa Cruz
2014

PIANO STUDY NO.1

Maayan Tsadka

The musical score consists of five systems, each with a treble and bass clef staff. The notation is handwritten and includes various musical symbols and performance instructions:

- System 1:** The bass staff begins with a series of descending eighth notes, marked with a forte (*f*) dynamic. The treble staff contains a few notes with a slur and an accent (^).
- System 2:** The treble staff features a melodic line with slurs and accents. The bass staff has a series of notes with slurs and accents.
- System 3:** The treble staff has a few notes with a slur. The bass staff continues with notes and slurs.
- System 4:** The treble staff has a melodic phrase marked "slower". Dynamics include *pp* (pianissimo), *f* (forte), and *mf* (mezzo-forte). The bass staff has notes with slurs and accents.
- System 5:** The treble staff has a melodic line with slurs and accents. Dynamics include *ff* (fortissimo), *mp* (mezzo-piano), and *sfz* (sforzando). The bass staff has notes with slurs and accents.

The image displays a handwritten musical score for piano, organized into five systems. Each system consists of a treble clef staff and a bass clef staff. The notation includes various note values, slurs, and dynamic markings such as *mp*, *p*, *ff*, and *f*. Performance instructions like *L* and *R* with arrows are present, along with breath marks (upward triangles) and phrasing slurs. The key signature is one flat (B-flat), and the time signature is 4/4. The score shows a complex interplay between the two hands, with the right hand often playing melodic lines and the left hand providing harmonic support.

The image displays five systems of handwritten musical notation. Each system consists of a treble clef staff and a bass clef staff. The notation is complex, featuring various note values, rests, and ornaments. Slurs are used to group notes across measures. Accents (^) are placed above certain notes. Grace notes are used to embellish the main notes. The bass staff often contains chords or complex rhythmic patterns, while the treble staff focuses on melodic lines. The overall style is that of a personal manuscript or a composer's sketch.

The image displays five systems of handwritten musical notation, each consisting of a treble clef staff and a bass clef staff. The notation is complex, featuring slurs, accents, and various accidentals (flats, sharps, naturals). The first system begins with a dynamic marking of *mp* and a *cresc.* marking with a dashed line. The second system also features a *cresc.* marking. The third system starts with a *ff* dynamic marking and includes a *sfz* marking in the bass staff. The fourth system has an *sfz* marking in the bass staff and a *eva* marking above the treble staff. The fifth system continues the melodic and harmonic development. The overall style is that of a working draft or a composer's sketch.

The image shows a musical score for a string quartet. The first system consists of a treble clef staff and a bass clef staff. The treble staff has a 15va marking above it and a dynamic marking of *fff* below it. The bass staff has a dynamic marking of *sfz* above it, a *Pedal* marking below it, and dynamic markings of *fff*, *ff*, and *mf* above it. There are also some handwritten annotations like 'Eva...' and 'b' in the treble staff. Below the first system are four empty systems of staves, each consisting of two staves.

P i a n o S t u d y N o . 2

For 2 performers and one grand piano

One performer plays repeatedly one of the bass notes on the piano keyboard (which has a single string) in a steady and moderate tempo. The second performer plays a very slow glissando on the string of the played key, starting from the closest point to the damper, moving to the far end of the piano. Listen closely and explore the transitions between the pure and complex partials.

When the far end of the string is arrived at, start going back (towards the keyboard, glissando only). Move freely back and forth on the string. The person playing the keys gradually accelerates. Coordinate the ending so that the last played note is not muted.

Pressure level: heavy pressure.

Variation: when arriving a pure partial on the string, add another string/key, and follow the same instructions.

To be performed in a very small room.

piano study no.3

maayan tsadka

The musical score consists of seven staves, each with a unique rhythmic pattern and fingering. The patterns are labeled as follows:

- Staff 1: Labeled 1:1, x1. It contains a single whole note.
- Staff 2: Labeled 2:1, x2. It contains a single half note.
- Staff 3: Labeled 3:2, x3. It contains a triplet of eighth notes.
- Staff 4: Labeled 4:3, x4. It contains a triplet of quarter notes.
- Staff 5: Labeled 5:4, x5. It contains a quintuplet of eighth notes.
- Staff 6: Labeled 6:5, x6. It contains a sextuplet of eighth notes.
- Staff 7: Labeled 7:6, x7. It contains a septuplet of eighth notes.

P i a n o S t u d y N o . 3

For 2 performers and one grand piano

Mark the nodes of one piano string up to the 7th harmonic (see diagram).

Follow the score.

In each measure, the bottom line indicates the played key. The top line (smaller notes) indicates the muted string.

Each line in the score corresponds to a harmonic.
The first line: fundamental (1st harmonic); second line: 2nd harmonic; etc., up to the 7th harmonic.

Each line in the score is in 4/4, and should be the same length. The ratios represent the rhythm.

The repetition of each line corresponds to the harmonics and rhythm. First line is played once; second line is played twice; etc.

Where there is more than one node for a partial play the same or different position.

Begin with an open string for the fundamental.
In the following measures harmonics should be muted simultaneously or after the played note, according to the indicated rhythm.

After the last measure has been repeated seven times, read the score from bottom to top, repeating the 7th line.

This time, the person playing the keys plays the fundamental for the first beat of each measure, holding down the key for the full duration of that measure. The remaining beats in the measure are played on the piano key which is the note of muted harmonic (the approximated sounding pitch). For example, when G is the fundamental and the 5th harmonic, B, is sounded as a harmonic, that same B is played on the keyboard as well.

Incorporate short rests between the played notes, if possible, in order to hear the deviation of the harmonic from the equal temperament (where, except for the octaves, the intonation deviates from 2¢ to 31¢).

The person muting the string plays only the first beat of each measure, keeping the string muted for the full duration of a measure.

To be performed in a very small room

Critical Mess Music Project

site-specific pieces for UCSC campus

Stop On Line. Wait for Signal. [version A]

A walk-through piece for the way to the library
For a large group of people

- 1.Find a piece of wood.
- 2.Stop on line.
- 3.Get a pulse.
- 4.Wait for signal.
- 5.Walk down and up the stairs and bang on the bars and light poles to your right with a study pulse.

===== = 3 beats
|| ||

===== = 5 beats
|| || ||

Play an accent on the first beat of each bar

***Bridge:** scratch with piece of wood as you walk

***Light pole:** play double the time you played on the bars,
fff > ppp
hit the upper part of the pole.
keep playing until the next person gets there.
if you are the last person and there is no one behind you,
proceed whenever time is right.

***Starting signal:** once a person in front of you in line
gets to the first light pole, it is the cue for the next
person to start.

***Once you get to the top:** hit the light pole (double time,
fff>ppp), until next person gets there.
the last person to get to the top improvise freely before
walking back.

***When you get to the last staircase(on your way back):** play
only beats 2&3.

***Once you are back at the starting point:** hit the sign
"stop on line wait for signal" once.

Listen to the sounds around you. Try to be synchronized with the beat you hear.

[Version B]

In this version, two people start simultaneously from the top right and left rails. The group starting on the right railings will come back via the left one, and vice versa. Similar to the first version, the second person in line starts once the previous person arrived at the light pole. Since the light poles on both sides are at different distances, only the first pair will start together. The rest of the instructions are similar to version A.

134 p a c i f i c

A walk-through piece for the terrace rails by the Music Center

For a large group of people

- 1.the group is divided into 2.
- 2.each person is assigned a number according to their place in line (first person-1, second-2, etc.)
- 3.get a pulse.
- 4.stand by the two far-ends of the rails, and hit them using your hand, starting one person after another, moving towards the center.
- 5.once everyone has reached their final position-(cannot move forward)-put your ear on the rail, and listen for about 20 seconds (keep hitting the rails!).
6. you will hear many sounds. Choose one specific pitch you like, and start humming it continuously.
- 7.gradually stop hitting the rail, but keep humming your sound.
- 8.once everyone is humming and no one hits the rails-gradually increase your humming volume to the maximum (be loud!), then decrease it to very quiet, until it dissolves.

*the tempo should be a moderate pulse

*the first person on both ends starts together, when given a cue.

*the next person in line starts once the previous person has moved few rails ahead, keeping the same pulse.

*hit the rail according to your assigned number (first person-one beat per rail, second person-two beats per rail, etc.).

*stress the first beat on each rail (you can use a fist for the first beat, and open hand for the rest, or any other way).

Music Box Office

A piece for the staircase behind the Recital Hall box office

For a large group of people

Take a few minutes to explore the acoustics of the space. Use your body, your voice, the structure, or anything else you can find.

Choose one sound you like.

The idea in this piece is to create a human music box, with one group of people producing the sounds while the other is indicating who's playing and when.

Form two groups: one group standing in a line along the staircase which will be the "music box" (producing the sounds), the other group will be the "operating system" which trigger the sounds. People in this group should wait for a cue at the top of the staircase.

The way in which one operates the music box is by walking up and down the stairs.

Whenever one is stepping on a stair-they will trigger the corresponding sound made by the person on the same stair.

There could be more than one person/sound on each stair.

The "operators" can walk freely up and down, in succeeding steps only.

One may switch sounds, but must switch their position as well.

One may switch their position while keeping their sound (for example, if you'd like your sound to precede/succeed another sound you hear).

At any point people may move freely between the two groups.

For the "operating" group: One may stay on the same stair for as long as they wishes, but the sound cannot be

repeated (this is for the sake of tempo—the speed in which one proceeds from one sound to the next).

If one wishes to sustain a sound, simply sit down on the stair corresponding to the sound you wish to sustain. If the sound is a short/percussive sound, simply repeat it.

The piece:

One person starts first, walking up and down the stairs, triggering each sound.

Once the first person introduced the sounds, the rest can join at any time.

Remember: people in the group producing the sounds can change position and keep their sound, change position and choose a new sound, join any other sound by sharing a stair with other people, or switch to the other group.

The piece can go for as long as the group wishes.

Once it's time to finish, people in the group triggering the sounds should gradually sit down on a stair of their choice (and while doing so, sustaining that sound).

The piece is over once all members of the "operating group" are seated.

The piece could be played in any other resonant staircase.

Part II: Essay

Persistence, Resistance, Resonance

Introduction: Echo

*She, who in others' words her silence breaks,
Nor speaks her self but when another speaks.¹*

– Ovid, *The Metamorphoses* book III

The well-known story of Echo as told by Ovid, among others, provides us with a fantastic (in the sense of imaginary, as well as wonderful) explanation to one of the most basic aural phenomena (and later on, with scientific developments, the sonic, or physical phenomena). Many stories and mythologies originated in an attempt to explain and understand various natural phenomena in the world around us. Sound, music, and musical instruments are fascinating elements due to the fact that they are integral to everyday life and nature, as well as having mystical associations. The Sirens, beautiful and dangerous sea creatures, for whose enchanting voices sailors drown themselves, are one example. Or the story of Pan, god of rustic music, who was famous for his pipe reed playing. According to one myth, the nymph Syrinx was transformed into a hollow water reed while running away from Pan. This reed produced a haunting sound to the breath of raging gods, or wind. Later on Pan cuts those reeds to create the first pan-pipe.

But let us return to Echo, a talkative mountain nymph, who frequently distracts Juno, queen of the gods (or Hera, in Greek mythology), by speaking relentlessly. Juno's husband, Jupiter (Zeus, in Greek mythology), was having love affairs with the other nymphs behind her back. When Juno learned she was deceived

¹ Ovid, F.R.G. Duckworth (editor). *The Metamorphoses of Ovid*. Book III. London : Blackie, 1911.

by Echo she was furious, and decided to punish the loquacious nymph by taking away her voice, leaving her with the ability to only repeat the last of what she hears, deprived of any words of her own:

*“That tongue, for this thy crime,
Which could so many subtle tales produce,
Shall be hereafter but of little use.”
Hence ’tis she prattles in a fainter tone,
With mimick sounds, and accents not her own.²*

Later on in the myth, Echo, desperately in love with Narcissus, yet not able to give voice to her love, can only repeat his calls. She comes to a tragic end where nothing remains of her body but bones and voice. Her presence dwindled into sound alone, to be found in vaults, valleys, mountains, caves, canyons.

*The sounding skeleton, of blood bereft,
Besides her bones and voice had nothing left.
Her bones are petrify’d, her voice is found
In vaults, where still it doubles ev’ry sound.³*

Ovid’s poem of Echo, inspired by earlier Greek mythologies and other folk tales, here intertwines with the famous story of Narcissus. In love with his own reflection, and unable to get away from it, he eventually finds his death and transforms into a flower. This draws an analogy between the visual effect of reflection and the aural effect of echo.

I would like now to focus on three main aspects derived from the story, which later on in the paper will resonate with some of my musical ideas about repetition, echo, and resonance:

² Ibid.

³ Ibid.

1. Echo could only **repeat** the last words of others; suggesting a repetition of some sort (repetition of one thing over and over or repetition after an external thing), or implying a notion of call and response;
2. Echo could only repeat the last words of **others**; she could not speak by herself, thus repeating the words of others means she does not have any original expression of her own, but merely imitates others. To repeat something is inherently different than creating (unless we argue that there is no such thing as absolute originality, therefore every creation is a repetition of some sort);
3. Echo could not learn how to speak first herself, or, could not speak before someone else did, which, in a different reading, also means that she could never be silent (as long as there are sounds around her). She is always a reflection and not a source. Embedded in this is also a notion of anticipation and uncertainty: she cannot predict when her voice will sound, as it is controlled by an external source. Yet knowing that her whole essence is being a sound, one can assume she anticipates the moment in which she is able to express herself, if only as a repetition.

Aesthetics of Resonance

1

Resonance is a response to external force.

2

Objects have unique natural resonant frequencies dependent on their physical properties. Resonant frequencies are independent of external conditions. External conditions amplify or attenuate inherent resonant frequencies of an object.

3

Echo as a reflection of a sound — a potential only manifested under certain conditions. Echo is resonance (response to a resonance?) devoid of original qualities.

4

Every sound has the potential of an echo that is only perceived given suitable external conditions, but physically occurs under any conditions. The perception of echo is dependent on *external conditions* that sufficiently reflect the sound.

5

Time delay is the distance between the resonant object and a receiver, divided by the speed of sound. The time difference between a sound and its echo differs depending on the distances between some number of bodies (at least one, not including the

resonant body). In the simplest case, of one impulse and one receiver, the echo is twice the distance. In the more complicated case, two receivers (not including the resonant object), the time difference between the impulse and the received echo is more a complicated function of location and distance (including the resonant object). This suggests that echo with more than one receiver is inherently heterophonic, even if not audible.

6

Resonance and *Echo* are both physical phenomena as well as metaphorical representations of social and musical processes.

7

Aesthetic of a work as observed through two lenses — compositional and perceptual. The latter is human perception and experience, based on a piece's construction. This perception cannot be controlled, but can be predicted to some extent. The former is controlled and intentional. The pre-modern use of the word aesthetics referred to sensory perception, and mainly explores mathematical ratios, rhythmic and harmonic organizations. The modern interpretation of the word shifts the meaning to focus on the experience of hearing music, taste, and beauty.

8

Other aesthetic considerations — beauty, taste, judgment — are inseparable from social structures and economic conditions that lead to dominant aesthetics, established by those in power.

9

Aesthetics of resonance — musical as well as political implications and manifestations. The aesthetics of a piece is not only its musical representation but also serves to musically resonate, reflect and interpret social/political/historical processes.

10

Resonance and echo imply social processes and organizations: call and response in various contexts (religious, protests, sports events); oral histories and traditions (which shape collective memory); group cohesion; amplification and unification.

10a

Resonance and echo imply musical processes and concepts: repetition; call and response; organum; heterophony; transposition; canon; round; fugue (to some extent); folk songs, and others.

11

Persistence is repetition of idea or action, connected to the idea of echo. (The difference between persistence and repetition: repetition is precise persistence?)
Repetition is a tool for engaging participants (in the physical world: prayers; field workers; protests). In music repetition is passive participation, used to build and often break expectation and tension for the listener. Repetition creates both unexpected effects, and familiarizes listeners with musical material in order to provide familiar territory. Repetition can eliminate or articulate diversity.

12

Resonance and echo can be fundamental to music's structure and dictate a particular aesthetic. Pieces that focus on the uses of resonance and echo share that aesthetic.

13

There are several manifestations of the Aesthetics of Resonance in musical pieces:

13a

The main structural elements incorporate *repetition* of some sort, either of musical material (notes, rhythm) or more abstract/gestural ideas, in order to: comment on the power of repetition; set expectation by repeating familiar material; or shift the focus to subtle elements (also as a tool to organize a group of people?).

70

13b

Use of the concept of *call and response*, in explicit or implicit manner.

13c

Prolonging the decay of a sound. A structural gestural element: impulse followed by a long silence in order to allow the perception of the subtleties of a sound and give equal weight to the decay and attack. When a varied prolonged decay is combined with repeated attacks the listener's focus may be shifted to the decay.

13d

The main physical and acoustic characteristics of an instrument, object, or space becomes a structural element as well as musical material (e.g. depressing keys of the piano in order to excite a sympathetic vibration, or allowing the uninterfered decay time of a sound).

13e

Once the physical and acoustic properties of sound become structural elements, they allow and require a deviation from the dominant equal-temperament tuning system. Therefore, it is not only an aesthetic choice, but also a political one, which deviates from the western hegemony. Ways of achieving that without using a determinate notation can be, for example, the use of text scores or other non-conventional scores;

the use of the natural resonance of objects; bending a string; the various ways of uncovering harmonics on an instrument; the use of technology and electronic music.

13f

Instrumentation: once the natural resonance of a sound is regarded as a main element in a composition, it may expand the sonic possibilities and liberate from conventions of using traditional musical instruments, and perhaps provide an opportunity to explore other objects that might not be considered musical instruments, in a musical context. For “traditional” instruments, it forces one to look into the mechanics of an instrument, to understand how it produces sound, and to explore possibilities within the instrument’s limitations. Considering the natural resonance of a sound as a main element may also influence the choice of instrumentation.

13g

By making the natural resonance of a sound a main element, the structure of a piece responds to the physical properties of sound rather than to musical material or conventional forms.

14

Aesthetic of Resonance in social/political context (metaphorical): reflect on and amplify certain ideas or concepts. Political aesthetic of resonance, in its most abstract core searches to echo and resonate the reality by means of musical representation,

without being explicit. The political aesthetic of resonance is explicitly manifested through protest chants, sports events, religious ceremonies, and more.

A Rhythm of Popular Unity

Crowd Mobilizing Rhythms [CMR]

The effect... which by virtue of the logic of repetition is also both clarification and unification. The movement of the whole piece is towards a new unity—an image of popular unity—made up of related but diverse, developing elements (not to be confused with uniformity), coordinated and achieved by a blend of irresistible logic and spontaneous expression.

(Christian Wolff, notes for Frederic Rzewski's record *The People United Will Never Be Defeated* [TPUWNBD], 1978)

Wolff wrote the above about Rzewski's TPUWNBD, 36 piano variations on the famous Chilean revolutionary song from the 1970s *El Pueblo Unido Jamas Sera Vencido*, composed by Sergio Ortega to lyrics by the group Quilapayún. I find it more generally applicable as a way of describing CMRs, or protest calls. Wolff's description is apt as to the sense of the repetitive nature of CMRs, their unifying effect, and their diversity of subject, language, and rhythmic variations. CMRs are one of the most striking social behaviors of peoples' spontaneous expressions of resistance and solidarity.

Throughout the world, and in different social and cultural situations, rhythms and beats are used to engage, organize, and mobilize people. The rhythms of protest and revolutionary chants and songs, various sporting events, children games and rhymes, share many features.

In what follows I will identify those most common rhythms, give examples, categorize them into three distinct groups, and offer a hypothesis about their origin and commonality in different places around the world. I will focus on protest chants, which were the main idea behind my piece *Sumud*. Protest and revolutionary songs, or other forms of lyrics set into a melody, might share with protest chants the purpose and result of CMRs, but were left out of this current research. The prevalence of similar rhythms around the world, in many languages and cultures, led me to wonder whether there is some kind of “universal protest rhythm,” or perhaps, more broadly, a universal crowd mobilizing rhythm.

How did those rhythms originate? Is there something musically, physiologically, or biologically inherent in these rhythms that makes them common in different places? Or did those rhythms wander via human contact from continent to continent, and later through media and technological developments? Since recording technology was not available until ca. 1877, it is hard to pinpoint an origin or even trace their evolution.⁴ Nor can one assume what the chants sounded like before recorded evidence, although there may be clues in written sources.

My hypothesis is that originally CMRs were derived from spoken language, which suggests and dictates their rhythmic patterns, along with some of the most basic human biological systems (heart beats, breathing) and common social behaviors (repetition, gathering in groups, marching, protesting). Today, partially due to technological developments and globalization, a reverse process has taken place. We

⁴ Edison’s mechanical phonograph cylinder was invented in 1877.

are now so familiar with CMRs that they influence and to some extent constrain the texts we set to them.⁵ While I believe they have some inherent elements that made them evolve organically in different places, it is my assumption that there used to be more variety among the popular chants, which became restrained and more unified under the wings of globalization.⁶

Three Prime Forms of CMRs

Most chants — throughout history, globally, and not insignificantly, from my own personal experience — can be represented by three prime forms. Most other chants are variations of these forms.

CMRs are meant to be repeated, catchy, and easily memorized. They share basic and natural characteristics of rhythmic organization: short phrases (one or two measures); duple meter; repetition; and simple subdivision. There are other, secondary factors that shape the rhythmic patterns, which I will describe later. Here I focus on protest calls, some collected from various protests in which I participated, in the US and in Israel/Palestine. Others are taken from video and audio recordings of protests around the world, mostly found on YouTube.

⁵ One example for that would be chants in which a word is repeated in order to fit those familiar rhythms, such as “Allende, Allende, El Pueblo Te Defiende!” or “Free, Free Palestine!”

⁶ Examples of content unhappily wedded to and dictated by these rhythms:

“A baby's not a baby til it comes out...

That's what birthdays are all about!” or

“Fuck the Courts and legislature:

I am not an incubator!” or

“Porn, strip clubs, and the church!

This woman-hating culture is the worst of the worst!”

StopPatriarchy.org Chants, <http://www.stoppatriarchy.org/protest-chants.html>

(1)

- a. *Short form*: one measure of four beats, starting on the downbeat. The simplest possible form:



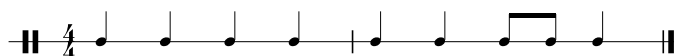
Example: “Make Love, Not War!” or “Hands Up, Don’t Shoot!” or “Draft Beer, Not Boys!”⁷

Common variation:



Example: “Hell No, We Won’t Go!” or “Free Free Palestine!” or American Sign Language rhythm (ASL): “BOAT BOAT BOAT-BOAT-BOAT” and “Virginia School for the Deaf’s Fight Song.”⁸

- b. *Long form*: two measures of four beats each, starting on the downbeat. The simplest possible form:



Example: “One, Two, Three, Four, Hell No We Won’t Go!”

Common variation:



Example: “One, Two, Three, Four, Occupation No More!”

⁷ Sources are occasionally given for historical context, but it is often impossible to accurately determine a source for something that might have originated somewhat organically. Sources are not given for current and well-known examples.

⁸ Bauman, Dirksen. Nelson, Jennifer. Rose, Heide. (editors). *Signing the Body Poetic: Essays on American Sign Language Literature*. Berkeley: University of California Press 2006.

The “sign rhythm” examples are from the accompanied DVD.

“BOAT BOAT BOAT-BOAT-BOAT” signed by George Kannapell (from a film by Charles Krauel) and “Virginia School for the Deaf’s Fight Song” signed by Freda Norman

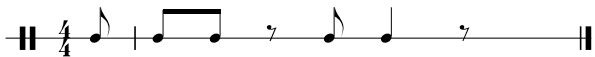
(2)

- a. *Short form*: one measure of four beats, starting with a pickup. The simplest possible form:



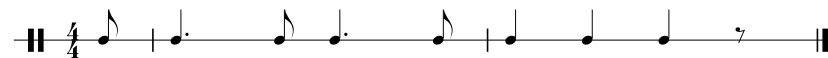
Example: “We’re Here! We’re Queer!”

Common variation:



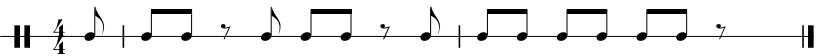
Example: “No Justice, No Peace!”

- b. *Long form*: Two measures of four beats each, starting with a pickup. The simplest possible form:



Example: “We’re Here, We’re Queer, Get Used To It!”

Common variation:



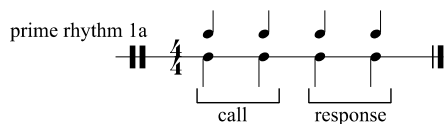
Example: “El Pueblo, Unido, Jamás Será Vencido!” or the English version “The People United Will Never Be Defeated!” or the feminine, less common version: “La Gente, Unida, Jamás Será Vencida!”

(3)

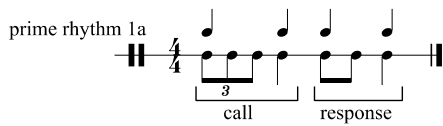
A form of call and response, one or two measures that could be categorized under either the first or second prime rhythms shown above.

- a. Call and Response: Prime Rhythm one

Short form:

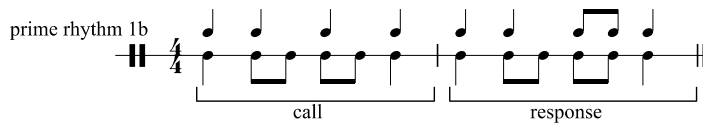


Example: “Whose Streets? Our Streets!”

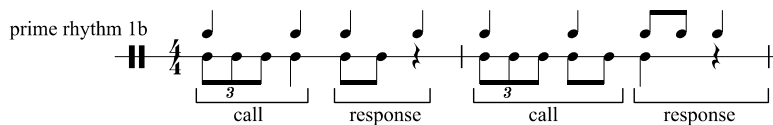


Example: “What Kind Of Pie? Occupy!”

Long form:

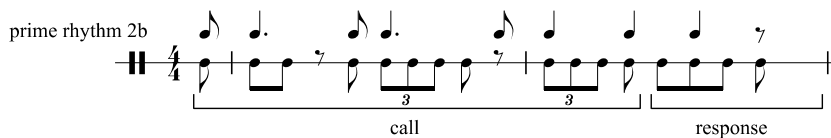


Example: “Whose University? Our University!”



Example: “What Do We Want? Justice! When Do We Want It? Now!”

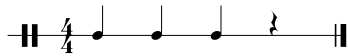
b. Call and Response: Prime Rhythm two



Example: “When Unions Are Under Attack, What Do We Do? Stand Up, Fight Back!”

Variations and chants in other languages

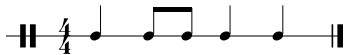
1.a. Variations of the short form, which incorporates rests and all possible simple subdivisions of the beats. Simple subdivision: does not include triplets or dotted rhythms. Subdivision of the fourth beat is excluded, since it is not commonly divided except for in a case of call and response (for reasons I’ll describe later):



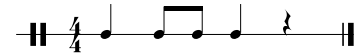
4th beat silenced: "No More War!" or "I can't Breath!"



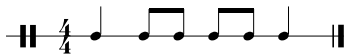
3rd beat divided: "Le-hem, A-vo-da!" "לחם, עבודה!"
(trans: "Bread, Work!" from Hebrew) and ASL rhythms mentioned in 1a.



2nd beat divided: "Bi-bi Ha-bay-ta!" "ביבי הביתה!"
(trans: "Bibi⁹ go home!" from Hebrew)



2nd beat divided, 4th beat silenced: "Dai La-ki-bush!" "די לכיבוש!"
(trans: "Stop the Occupation!" from Hebrew)



2nd+3rd beats divided: "Ma-vet La-smo-la-nim!" "מוות לשמאלנים!" (trans: "Death to the Leftists!" from Hebrew), or "Ku-lanu Pan-te-rim!" "כולנו פנתרים!"
(trans: "We Are All Panthers!" from Hebrew)¹⁰



1st+2nd beats divided: "A-ra-vim Ha-bay-ta!" "ערבים הביתה!"
(trans: "Arabs Go Home!" from Hebrew)



1st+3rd beats divided: "Me-di-nat Mish-ta-ra!" "מדינת משטרה!"
(trans: "Police State!" from Hebrew)

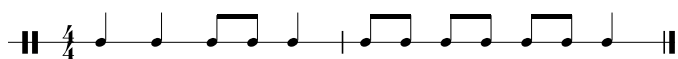


1st+2nd+3rd beats divided: "A-na-shim Lif-ney Shta-him!" "אנשים לפני שטחים!"
(trans: "People Precede Territories!" from Hebrew)

⁹ Benjamin Netanyahu.

¹⁰ Israeli Black Panthers movement chant from 1971
YouTube. <https://www.youtube.com/watch?v=oc17wBfFreE>

1.b. Variations of the long form, which are mostly a combination of 1a rhythmic patterns, in any order:



“Hu Ha Mi Ze Ba Rosh Ha-mem-sha-la Ha-ba!” “הו הא מי זה בא ראש הממשלה הבא!”
 (trans: “Who’s Coming? The Next Prime-Minister!” from Hebrew)



“One, Two, Three, Four, We Don’t Want Your Fucking War!”



“Lo Tuh-lu Le-ha-mit Hit-nag-dut A-ma-mit!” “לא תוכלו להמית התנגדות עממית!”
 (trans: “You cannot defeat popular resistance!” from Hebrew)

2. Variations of the second rhythm long form, which are mostly a combination of 2a rhythmic patterns, and usually includes 1a patterns in the second measure:



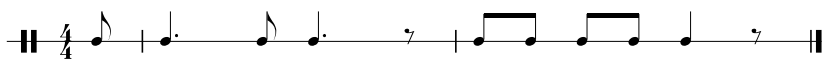
“Bil Rouh, Bil Dam, Naf-deek Ya Fa-las-tine!”

"بروح بالدم نفديك يا فلسطين"

(trans: “In Blood, in Spirit We Shall Redeem You Palestine!” from Arabic)



“Bil Rouh, Bil Dam, Naf-deek Ya Sa-ddam!”



“Ha-am Do-resH Tse-dek Hev-ra-ti!” “העם דורש צדק חברתי!”
 (trans: “The People Demand Social Justice!” from Hebrew)



“Resistance Is Justified When People Are Occupied!”



“Allende, Allende, El Pueblo Te Defiende!” (trans: “Allende, Allende, The People Will Defend You!” from Spanish).¹¹

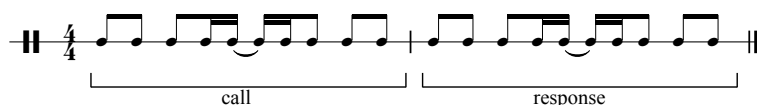
¹¹ Chile, early 1970s protest. YouTube. <https://www.youtube.com/watch?v=WoTbjWdAT5I>

Rhythmic Analysis

Musical Elements	Social Reasoning
Repetition	encourages mass engagement; enhances ecstatic elements; serves as a means of natural amplification (along with mass participation); clarificating and strengthening the message; unifies elements.
Duple meter	binary; simplest possible meter (two is simpler than three); symmetry;
Maximum of two measures	easy to memorize
Simplicity of rhythmic subdivisions	easy to memorize; simplifies the message; derives from syllabic division.
No rest on the first beat (and usually not on the second and third downbeats as well)	generates momentum; perpetuates flow.
The fourth beat is usually not subdivided, and often has a rest on the down or up beat ¹²	physiological—leaves room to breath (breaths usually occur at the end of repeated phrase).

Rhythmic variations of basic chant forms can be considered a case of rhythmic recursion, or a rhythm tree.¹³ The basic rhythms are similar, but variations may

¹² Except for in a case of call and response, such as:



“Show me what democracy looks like! This is what democracy looks like!”

Language

Prosody plays a crucial role in the construction of protest chants. A chant's rhythmic organization is derived from a phrase's syllabic division. The message must be delivered in a concise, strong, clear, and unambiguous phrase, but one that is also simple enough to remember and repeat.

Not all chants rhyme, especially short ones. But rhyme is generally of great importance in shaping the chants, in fact often equally important to rhythm and syllabic division. Rhythm tends to provide larger structure, while the text dictates the inner rhythmic organization. Rhyme often dictates the text.

Language often defines a nation or group of people, both socially and culturally. It reveals the uniqueness, differences, and individuality of places and societies, especially in the age of accelerated globalization. Despite language differences, there is an almost universal rhythmic similarity in protest chants. This led me to the belief that aside from language, there are other, more universal parameters that shape the structure of the chants.

Biological Aspects

Two main biological and physiological aspects might account for some of the universals chant rhythm: heartbeat and breath. The rhythm of a *heartbeat* is often described as "lub-dub." This is rhythmically connected to the second rhythmic prime form, which starts with a pick up and contains dotted rhythmic values. The circulatory system produces two main sounds associated with heart valves closing

and changing the blood flow, called LUB (S1, first heart sound) and DUB (S2, second heart sound). The former is caused by the closing of the atrioventricular (AV) valves, the latter by the closing of the semilunar (SL) valves. The sudden block of the valves causes a reverse in the blood flow, and produces the sounds.

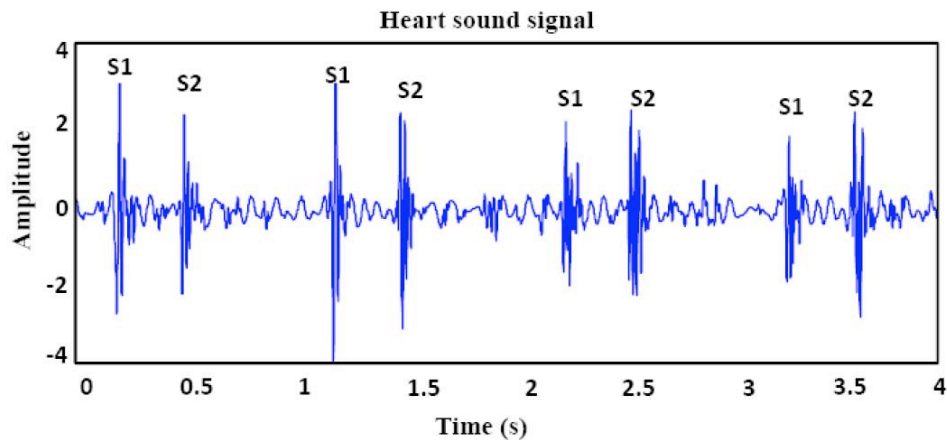


Figure 1. Normal heartbeat signal.¹⁴

During the continuous repetition of a spoken phrase, the rhythmic organization must include space for *breathing*. This might explain the common rest on the final beat, as well as the rarity of subdivision of that beat, for the necessity of leaving space for breathing. For example, chants whose syllabic division suggests a triple meter, such as “No More War!” are generally in duple meter with an additional rest on the final beat.

Social Aspects

As noted above, in order for chants to be effective in a social, mostly spontaneous, context, they need to be short, rhythmically simple, and easily recited and memorized

¹⁴ Biometrics Security Laboratory at the University of Toronto.
www.comm.utoronto.ca/~biometrics/medical/heart-sound-fundamentals.html

by a group. Continuous repetition is a means of symbolic amplification of the message, and is thus a rhetorical device. Repetition is also a practical way to naturally amplify the message, since it facilitates a mass of people chanting together, which is required in order to be effective and heard from a distance.

Protests are social gatherings and often include marching. A rhythmically synchronized walking pace might suggest a reason for the great similarity in tempi among chants. The idea of marching could also be an explanation for the nearly universal duple meter.

I Am a Human Microphone

Mic check / MIC CHECK!
With every few words / WITH EVERY FEW WORDS!
Repeated and amplified out loud / REPEATED AND AMPLIFIED OUT LOUD!
By what has been dubbed / BY WHAT HAS BEEN DUBBED!
The human microphone / THE HUMAN MICROPHONE!!!¹⁵

Human microphone (also known as *human megaphone*, or *mic check*, or *people's microphone*) is another way of amplifying messages at large gatherings. It might have originated in the 1970s anti-nuclear movement, as a means of avoiding the necessity of a legal permit usually required for using electronic amplification devices at public assemblies. Once a speaker gets the crowd's attention, they split their speech into

¹⁵ *The Nation* blog. www.thenation.com/blog/163767/we-are-all-human-microphones-now#

short phrases to be echoed by the assembled others. With a large crowd, multiple waves of repetition might be necessary.¹⁶

The human microphone has a number of important results. The participants internalize the message itself through repetition, and also amplify it so it is audible for bystanders, who are often a specifically targeted group.

The human microphone doesn't share the same rhythmic limitations used to deliver a message in the form of protest chants, but the two methods share certain features. In both, the message is echoed, antiphonally structured, and naturally amplified. The rhetorical features of protest chants — simplicity, repetition, and emotional appeal — are also present in the human microphone, mainly through repetition by the crowd. An individual speaker's rhetorical prowess is also communicated, and transformed in interesting ways, by unison repetition. However, unlike protest chants, the human microphone can convey elaborate, more complex messages.¹⁷ And also unlike protest chants, control of the message is empowered to the voice of one person.

¹⁶ YouTube. www.youtube.com/watch?v=VoJBZxOh4bY

¹⁷ Examples for human microphone used in 2011 Occupy Wall Street by Slavoj Zizek and Cornel West.

YouTube. <https://www.youtube.com/watch?v=eu9BWlcRwPQ>

YouTube. <https://www.youtube.com/watch?v=fJbS5N-hzqs&list=PLlbMk27LYcnnnIxwrDbnNzX2kWLJnm40G&index=4>

Silent Protest

Silent protests are an extreme sonic contrast to chants, but are no less powerful. An early example is the silent parade of July 28, 1917 in New York City, organized by W.E.B. Du Bois and the National Association for the Advancement of Colored People (NAACP), protesting anti-black violence. The only sounds heard were those of muffled marching drums, while the voices of the tens of thousands participants were silent.¹⁸ It is a powerful statement about deprivation of voice.

*The loud, noisy ones do call attention to themselves, but a silent protest evokes feelings of mourning and loss, a deprivation of rights, people who have lost their voice or withheld their voice. This creates a real effect on the bystander and on the people doing the marching.*¹⁹

Another oppressed group that frequently uses silent protest as a tool is the Mexican Zapatistas Movement. At the end of a mass silent protest in Chiapas in December 2012, spokesman Subcomandante Marcos said: "Did you hear? It is the sound of your world collapsing. It is our world coming back."²⁰

Can silence resonate?

¹⁸ *NY Times* blog. http://cityroom.blogs.nytimes.com/2012/06/15/a-history-of-making-messages-heard-silently/?_r=0

¹⁹ *Ibid.* William Kornblum, sociology professor at the City University of New York. Quoted in the above article.

²⁰ *The Guardian*. <http://www.theguardian.com/commentisfree/2012/dec/31/zapatistas-mexico-politics-protest>

YouTube. https://www.youtube.com/watch?v=5K_z_ceSlwE

Unifying a Complexity:

The Dialectic of Protest Chants

Protest chants can be an expression of solidarity and freedom, yet they can be (and have been) used for controlling and oppressing people.

Chants can be tools for delivering the essence of a message in the simplest, clearest way, yet they also simplify and negate the subtleties of complex ideas—regardless of the political message.

Chants utilize the lowest common denominators of human expression by popularizing a message. They are pluralist: they can be a voice for “the common people,” engaging a maximum amount of participants towards a specific end.

Chants can be a spontaneous expression of concision and sincerity, yet they can also be manipulatively rhetorical. Chants are rhetorical by virtue of repetition alone, but not only.

Chants can be the voice for people in the streets, for popular struggles, for diversity, for individuality. But they can also be a way to unify diverse voices into one voice, echoing a simple message uniformly, quashing individuality and flattening diversity.

Chants can use language as a tool for authentic nationalistic expression, but they can also transcend language differences and unite struggles around the world via rhythm.

They can be many voices and a single voice at the same time.

Is it unity or uniformity?

Coda

Physical resonance and echo are acoustic phenomena. They always occur as an impulse response, but are not always perceived.

Social resonance and echo can be literal or metaphorical, or both, such as in protest chants.

Political resonance and echo are only metaphorical.

...The European élite undertook to manufacture a native élite. They picked out promising adolescents; they branded them, as with a red-hot iron, with the principles of western culture, they stuffed their mouths full with high-sounding phrases, grand glutinous words that stuck to the teeth. After a short stay in the mother country they were sent home, whitewashed. These walking lies had nothing left to say to their brothers; they only echoed. From Paris, from London, from Amsterdam we would utter the words 'Parthenon! Brotherhood!' and somewhere in Africa or Asia lips would open ... thenon! ... therhood!' It was the golden age.²¹

Jean-Paul Sartre, Preface to Frantz Fanon's *The Wretched of the Earth*, 1961

²¹ Fanon, Frantz. *The Wretched of the Earth*. Grove Press, 1963, 7.

Analysis of Compositions

SUMUD: Rhetoric of Resistance in three movements

For Two Pianos and Two Percussion Players (2013-14)

Sumud is a musical investigation and observation of protest rhythms, the power of repetition and synchronization, and the rhetoric of resistance as expressed through protest chants. It was written as part of my search for abstract political expression in music. *Sumud* explores the interaction between music and politics, and tries to erase the borders between them, drawing lines between persistence, resistance, and resonance.

Performance

The piece was premiered at the April in Santa Cruz festival 2013 by the ensemble yarn/wire. It was later revised, and that new version was performed by pianists Kumi Uyeda and Michael Seth Orland, and percussionists Ward Spangler and Aiden McKee, at the April in Santa Cruz festival 2014.

The Title

“Sumud” is an Arabic word literally meaning “persistence,” or “steadfastness.” It is not just a word, but a political-ideological concept and strategy, which emerged in response to the Israeli occupation of the Palestinian territories. Sumud manifests itself in non-violent resistance.

Sumud is embodied in two ways. Static sumud is the struggle against occupation and forced evacuation from one's land. It is expressed by clinging to one's land. The second embodiment of sumud is dynamic political strife in search of new and alternative channels of resistance, such as weekly protests and different forms of strikes.

Throughout the piece I explore the concept of sumud by juxtaposing persistent musical elements (pitch, rhythm, texture, melodic figurations), common protest rhythms, and symbols of oppression (represented by the muted piano strings, which do not allow full and free expression of either full musical statements, or the natural resonances of the instrument). It is also a poetic expression of the intimacy of conflict.

Instrumentation

The two pianos define a physical and visual territory on stage; a solid, static ground, into which the percussionists intrude and intervene. The two percussionists play most of the first two movements inside the pianos, muting the strings and restraining their natural resonance. They prevent the piano from fulfilling its idiomatic sonic potential, while revealing other acoustic elements inherent to it. In the third movement they switch to two timpani—something of a sonic allusion to military bands—to expose the protest rhythms underlying the whole piece.



Figure 2. *Sumud*, instruments set up, April in Santa Cruz music festival, April 11, 2014.

Notation and Preparation

Piano Notation

In order to emphasize the natural resonant qualities inherent to the piano, three techniques were primarily used: (a) depressed keys, above and below played notes; (b) notated released notes, to be performed with as much intention and precision as the played ones; (c) muted strings inside the piano. In addition, long fermatas are used often to allow the sound to decay naturally and attune to its subtle properties. If performed in a large hall, one microphone in each piano should be used in order to amplify those qualities.

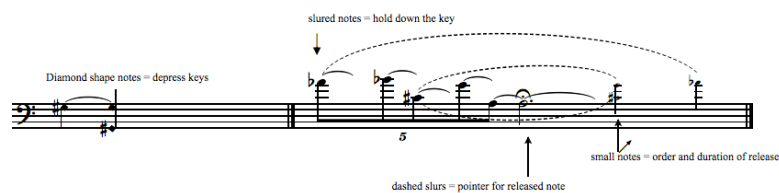


Figure 3. *Sumud*, example of the performance instruction. Left: notation for depressed keys; Right: notation for released notes.

(a) Depressed Keys

In order to evoke sympathetic vibration of higher or lower strings, the depressed keys correspond to one of the first seven harmonics of a played note, often more than one simultaneously.



Figure 4. *Sumud*, movement I, example for depressed keys on the pianos, mm.142 – 150.

(b) Released Notes

My intention was to notate the released notes in a way that gives them equal weight as the actual struck notes. Instead of playing and listening only to the accumulation of notes into a chord or a cluster, the intention of the performer, and hopefully the attention of the listener, is focused and attuned to the reversed process of reduction of notes and density. This is articulated by repeated melodic figurations, differentiated in order and duration of the released notes. The notation reflects the order and duration. Released notes are represented by smaller note heads, with a dashed slur tying the played note to the released note for clarity.

Figure 5. *Sumud*, movement I, example of released notes, mm.59 – 63.

(c) *Muted Strings*

Five of the low strings of each piano are marked with numbers. Those numbers indicate specific harmonics up to the 7th partial, representing multiple nodes along the string. The notation specifies the played note, whether it should be muted, muting position, instruction to release or sustain the muted string, and an approximation of the sounding pitch.

Figure 6. *Sumud*, example from performance instruction.

The numbers represents the following partials:

- (1) two octaves+M3 higher, 5th partial
- (2) two octaves+m7 higher, 7th partial
- (3) one octave+P5th higher, 3rd partial
- (4) two octaves+M3 higher, 5th partial
- (5) two octaves+m7 higher, 7th partial
- (6) one octave higher, 2nd partial
- (7) one octave+P5th higher, 3rd partial
- (8) two octaves higher, 4th partial
- (9) two octaves+M3 higher, 5th partial
- (0) two octaves+P5th higher, 6th partial

The image shows a musical score for two pianos, Piano I and Piano II, covering measures 9 and 10. The score is written in 4/4 time with a key signature of one sharp (F#). Each piano part consists of a treble and a bass clef staff. In measure 9, Piano I has a treble staff with notes G4, A4, B4, and C5, and a bass staff with notes G2, A2, B2, and C3. Piano II has a treble staff with notes G4, A4, B4, and C5, and a bass staff with notes G2, A2, B2, and C3. In measure 10, Piano I has a treble staff with notes G4, A4, B4, and C5, and a bass staff with notes G2, A2, B2, and C3. Piano II has a treble staff with notes G4, A4, B4, and C5, and a bass staff with notes G2, A2, B2, and C3. Dynamic markings include *mp*, *f*, and *mf*. There are also some markings like '+' and 'o' on the strings, which correspond to the partials listed in the text above.

Figure 7. *Sumud*, movement I, example for muted strings, mm.9 – 10.

Two diagrams show the harmonics to be marked on the string. The first shows all the nodes as represented on a G2 string and includes an approximate sounding pitch.

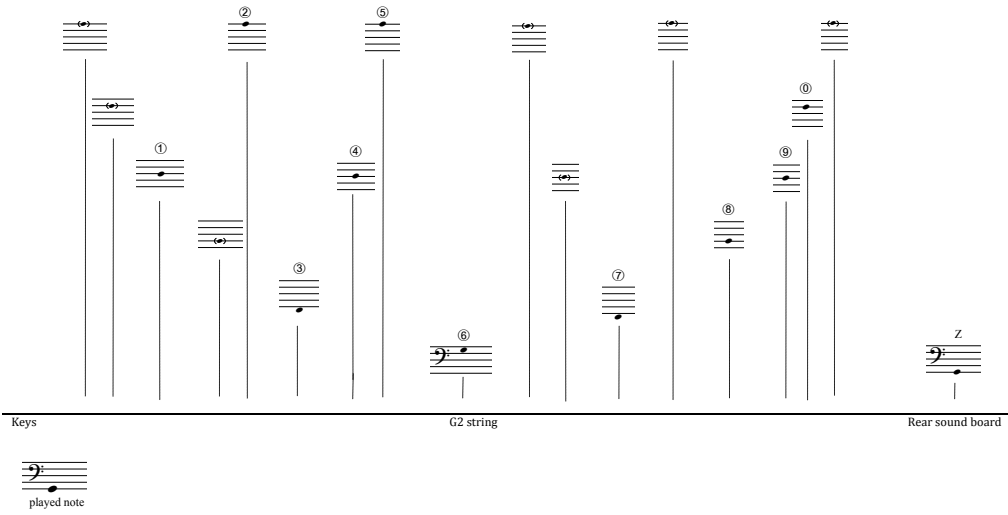


Figure 8. *Sumud*, nodes on a string diagram, from the performance instructions.

The second is a diagram of the piano with the specific locations as used in the score.

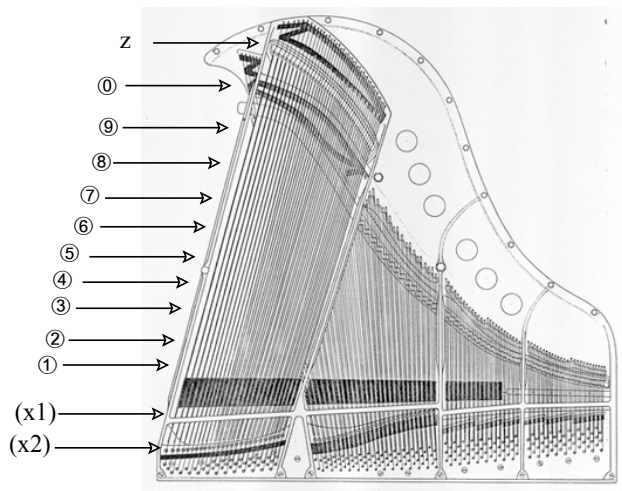


Figure 9. *Sumud*, muting positions on a string diagram, from the performance instructions.

The Five muted strings are: A0, E1, G1, C#2, G2, and include some similar resulted harmonics that would vary in intonation. For example, the 3rd harmonic of A0 string would be very close to the 2nd harmonic of E1 string.

Percussion Notation

For most of the piece, the percussion players are in charge of muting the strings inside the piano. This extends both the possibilities available to the player inside the piano and the pianist at the keyboard. The score specifies numbers (harmonics), an arrow between two numbers (inharmonics), or a string glissando between two numbers.

The image shows a musical score for measures 9 and 10. It consists of four staves: Percussion I, Piano I, Percussion II, and Piano II. The Percussion I staff has a circled 6 with a double-headed arrow to a circled 7, followed by a dashed line with 'sim.' above it, then a circled 7 with a dashed arrow to a circled 8, and finally three circled 8s. The Piano I staff has a circled 6 with a dashed line below it. The Percussion II staff has a circled 6 with a double-headed arrow to a circled 7, followed by a dashed line with 'sim.' above it, then a circled 7 with a double-headed arrow to a circled 8, and finally three circled 8s. The Piano II staff has 'poco cresc.' written above it and a circled 6 with a dashed line below it. The measure numbers 9 and 10 are indicated at the top left.

Figure 10. *Sumud*, movement III, example for percussion notation mm.9 – 10.



Figure 11. *Sumud*, picture from the performance at the April in Santa Cruz music festival, April 11, 2014.

Rhythmic Organization

During the summer of 2012 I collected field recordings of protests in occupied Palestine: East Jerusalem and the West Bank. The chants— in Hebrew, Arabic, and English— are similar to the ones I discussed in the previous section.

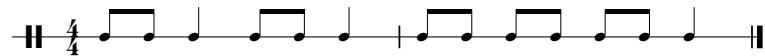
I transcribed six of those rhythms; all are variation of the first form:



“One, two, three, four, occupation no more!”



“Five, six, seven, eight, stop the settlers stop the hate!”



The image shows a musical score for two pianos, Piano I and Piano II, in 4/4 time with a key signature of one sharp (F#). The score is divided into two systems. The first system covers measures 1-8, and the second system covers measures 9-14. Piano I starts with a half note G4 (marked with a '+' and 'o') and a half note A4 (marked with a '+' and 'o'), followed by a half note B4 (marked with a '+' and 'o') and a half note C5 (marked with a '+' and 'o'). The dynamics are p. Piano II starts with a half note G4 (marked with a '+' and 'o') and a half note A4 (marked with a '+' and 'o'), followed by a half note B4 (marked with a '+' and 'o') and a half note C5 (marked with a '+' and 'o'). The dynamics are mf. The tempo is marked p=50. The score continues with various rhythmic patterns and dynamics including f, mp, and mf.

Figure 12. *Sumud*, movement I, mm.1 – 14.

In the second movement the rhythmic patterns are more explicit, but are “interrupted” by the percussion players muting the strings. The movement begins with an introduction of all six rhythmic variations, played on an open string and alternating between the pianos. The last beat of each rhythmic pattern is interrupted by muting the string.

The image displays a musical score for four parts: Percussion I, Piano I, Percussion II, and Piano II, covering measures 1 through 6. The score is written in bass clef with a tempo marking of $\text{♩} = 130$. Percussion I and II parts include circled numbers (1, 2, 3, 4) and arrows indicating specific rhythmic events, along with the instruction "mute position". Piano I and II parts feature dense rhythmic patterns with dynamic markings of ff and fff . A dashed line labeled 8^{th} spans across the piano parts. A note between measures 4 and 5 is marked with an asterisk and the text "* between partials 4 and 5 (perc I) / 5-6 (perc II)".

Figure 13. *Sumud*, movement II, opening bars, mm. 1 – 6.

As the movement progresses, the percussion players mute more and more notes from the pattern, making it less obvious. The rhythmic patterns still underlie the whole structure, but have a more percussive character.

Figure 14 shows a musical score for measures 11-14. It features four staves: Percussion I, Piano I, Percussion II, and Piano II. Percussion I has a melodic line with fingerings 2, 4, 5, 2, 5, 2, 3, and 1. Piano I and Piano II play a rhythmic pattern of eighth notes, with Piano I marked 'cresc.' and 'ff'. Percussion II has a rhythmic pattern with fingerings 8 ↔ 9, 8 ↔ 9, 9, 9 ↔ 10, 9 4, 9 4, 4 ↔ 3, 3, 3 ↔ 2, 1. Annotations for Percussion II include '*same position applies to both strings', '(on E string)', and '(A string)'. Dynamic markings 'cresc.' and 'ff' are present for Piano I and Piano II.

Figure 14. *Sumud*, movement II, mm.11 – 14.

The second movement ends with interlocking patterns at the very high range of the piano; this adds to its percussive quality.

Figure 15 shows a musical score for measures 46-47. It features two staves: Piano I and Piano II. Both staves play a rhythmic pattern of eighth notes. Piano I is marked 'ff' and Piano II is marked 'ff' and 'una corda'. A double bar line is present between measures 46 and 47.

Figure 15. *Sumud*, movement II, mm. 46 – 47.

The third and final movement is the only movement in which the pianos are not muted; the percussion players now play the timpani, bringing out the rhythms loud and clear. The movement begins with a gradual accelerando. All the instruments join the rhythmic unison one after another. This is meant to evoke the role of music in political and social situations: the way it draws in the masses, delivers a message, and the power of repetition. It is intentionally full of pathos, alluding to the rhetorical nature of protest chants.

The image shows a musical score for four parts: Perc I Timpani, Perc II Timpani, Piano I, and Piano II. The score covers measures 13 to 17. At measure 13, there is a rehearsal mark 'R' and an 'accel.' marking with a dashed line extending to measure 17. Percussion I and II play a rhythmic pattern of eighth notes. Piano I and II play a rhythmic pattern of sixteenth notes. The score includes dynamic markings of 'f' and 'ff', and rehearsal marks 'R' and 'N'.

Figure 16. *Sumud*, movement III, mm.13 – 17.

After the introduction of the patterns, the group no longer plays in rhythmic unison, rather they overlap the patterns to start at different beats of the measure, accent different beats, or play a modified version of the rhythm (e.g. cutting the last beat of a phrase).

The image shows a musical score for measures 27-30. It consists of four staves: Perc I Timpani, Perc II Timpani, Piano I, and Piano II. Perc I Timpani has notes marked with circled N and C. Perc II Timpani has notes marked with circled N and R. Piano I and II have notes marked with circled S. Dynamics include *ff* and a crescendo hairpin.

Figure 17. *Sumud*, movement III, mm.27 – 30.

Pitch and Sonic Materials

Derived from the acoustics of the piano, most of the pitch material in the piece is based on the lowest note of the piano: A0 (27.5 Hertz) and its harmonic series.

The muted strings are all partials of the A0 harmonic series (G, E, C#). The pitch material extends to the harmonic series of those strings as well. Eliminating octave doubling, the pool of pitches based on the harmonic series of A, C#, E and G is: a, b, c#, d, e, e#/f, g, g#. The Timpani are tuned to A2, A3 and G3.

The piece utilizes the tension between pure and complex sounds. It shifts between pitches that are part of the harmonic series to inharmonic partials, in the piano as well as in the percussion instruments (cymbals, chimes, and crotales).

Repetition and Echo

Repeated Note

The note G# is repeated relentlessly, primarily in the first movement. It is a solid, persistent point that keeps coming back, but is also a starting point for many of the melodic textures. It might be seen as a musical interpretation of the concept of static Sumud.

Repeated Melodic Figuration

The half-diminished arpeggiated chord and the descending five-note chromatic figuration in the first movement are two repeated and echoed melodic figurations. They are echoed among themselves, by repetition and by using the released note technique, and are also echoed between the two pianos.

Repeated Rhythms

The rhythmic patterns based on protest chants are used as rhythmic organization on several levels: the overall structure of piece; within each movement; and at the micro-level of the measure or a short phrase. The sympathetic vibrations resulting from depressed keys, the muted strings, and the released notes—are a resonance and an echo of previously struck notes.

Three Piano Studies

The piano studies started as a way of exploring small musical ideas used in *Sumud*, and ended up being an elaboration of those ideas.

Piano Study No. 1, for one performer, explores different resonances in the piano using depressed keys in the left hand, while constantly playing a chromatic scale in the right hand.

Piano Study No. 2, for two performers, explores the idea of a string glissando, moving between harmonic and inharmonic partials on a string.

Piano Study No. 3, for two performers, explores nodes on a piano string up to the 7th harmonic with rhythmic correspondence to the intervallic ratios.

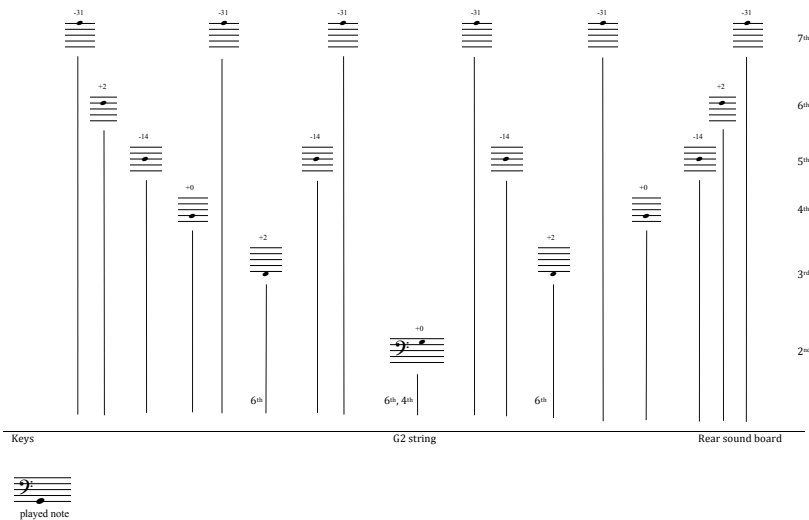


Figure 18. *Piano Study No.3*, nodes on a piano string diagram.

Critical Mess Music Project [CMMP]

Critical Mess Music Project is an ongoing series of site-specific pieces based on text scores.

The main ideas explored in this project are to:

1. Create site specific works that are musical compositions, exploring the sonic potentials of different spaces;
2. Include the local community in the process of music making;
3. Explore the compositional and social ideas and effects of a mass of people collectively performing a piece;
4. Take the music outside of the traditional concert hall and make it more accessible;
5. Make music with people who are not necessarily trained musicians and without using traditional musical instruments;
6. Make music that calls for active rather than passive participation and consumption, challenge and blur the boundaries between audience, performer, and composer.

1. Site Specific

The unique and beautiful campus of University of California Santa Cruz—surrounded by redwoods, wild animals, tall bridges, and overlooking the ocean—has been an inspiration for these pieces. I wrote this site-specific series of pieces around the UCSC campus as a way to engage with the campus community—people, sounds, and

landscape. As I wandered through campus, I explored specific locations: their sonic, physical, and visual possibilities, and the objects in them that people walk by everyday. I tried to offer a different perspective or another way of experiencing those spaces.

From a compositional perspective it was a challenge to break my own familiar conventions about form, musical material, instruments, notation, and performers. I wanted the natural environment—its acoustics, resonance, physical structures, and people—to dictate the form and character of each piece. Pieces of wood and metal railings become instruments. The number of railings or stairs in a staircase dictates the pace and durations. The members of the audience become the performers. The natural sounds of the environment add another layer to the soundscape. And, finally, the outside surroundings become the concert hall.

2. Communal Elements

The community living and working around campus is an important part of the piece. These pieces try to engage people with one another and in the process of music making. The pieces try to create a shared experience in familiar locations that are part of the participants' daily life. As a composer I am taking a new role for myself, trying to give up control over many of the elements in a piece, such as duration, musical material, structure.

3. A Mass of People

The idea of a mass of people creating something together, collaborating towards a shared goal, is powerful and empowering. This idea illustrates the power of the masses, something that cannot be done to the same effect with a small group. The scores call for a large group of people, but don't specify a number. In this way, the outcome of the piece—the length, density, form, and character—depends on the number of participants.

4. Outdoor Experience

The venue of the recital hall excludes many people from the experience of music. It is a sterile, isolated environment, with its own rituals, hierarchies, and class associations. John Tilbury, in his book *Cornelius Cardew: A Life Unfinished* writes about concert hall music and Mozart and Beethoven as “composers of the bourgeoisie”: “Cardew is alluding rather to the confinement of the classical composers to middle-class concert venues which are comparatively rarely patronized by working-class people. In other words this has more to do with social exclusion and alienation than with the ideological content of Beethoven's, or Mozart's, work.”²² Having music performed outside, open and free for all to participate or observe, is a way to break those hierarchies, and to include more people in the process and experience of contemporary music.

²² Tilbury, John. *Cornelius Cardew: A Life Unfinished*. Copula press: 2008, 782.

5. Untrained Musicians

The idea and will to include many people in the process of music making, musical experience, and to create new musical forms, creates many challenges. The first is how to write music for people without the privilege (and often the limitation) of traditional musical training. The use of traditional music notation is restricted, as well as the use of traditional instruments. The traditional western notation system signifies what are considered to be the main elements of music: discrete pitch and rhythm; discrete dynamics and articulation; specific instrumentation; required musical training; division between performers, composer, and audience; and equal-tempered tuning system. Text scores allow for more people to participate. They convey more open and democratic musical ideas, but also require clear and precise descriptions of the musical form and process. Found objects, physical structures, and the acoustic properties of the environment become the instruments and the venue.

6. Active Participation

In CMMP the audience members are the performers, and in some instances—the composers. One could choose to only be an audience member, or one could be an unintentional audience, since the pieces are performed in public spaces. A musical piece is typically a product that people consume. As an alternative to this passive consumption of music, CMMP calls for active participation in the process of music *making*, not just active music listening. These pieces make participation open to all.

The indeterminate text scores allow participants to become the performers and composers by making individual decisions on various elements of the piece (for example see *Music Box Office*).

CMMP pieces are ephemeral events. They cannot be reproduced by performance in another place, at least not in the same way as performed before. While they can be (and are) technologically documented, that technological document is not an accurate *reproduction* of the piece. The pieces themselves provide an experience that is unique to a specific group of people, place, and time. The only way to experience the pieces is to participate in them. The pieces attempt to challenge and obscure traditional hierarchies and boundaries in music, many of which are established by those in power.

About the Pieces

Stop on Line. Wait for Signal.

Stop on Line. Wait for Signal. is a walk-through piece for the staircase and metal railings crossing the redwoods forest between the Academic Resource Center and McHenry Library. The physical structure—stairs, railings in various shapes, light poles, and a wooden bridge—dictates the form of the piece and the musical elements. The participants pick up a piece of wood from the ground, which is used as an instrument. They hit and resonate the rails. The score contains a list of instructions to be performed, interacts with the structure. For example, rails with three sides will

result with playing three beats, and the ones with five sides, five beats. It is a walk-through piece in which the performers get a steady beat, join and leave the piece one after another, and shape the form of the piece. This gradual process goes from a sparse texture to an increased density and back. The piece takes place in a public, outdoor site that many students pass by every day. As one walks through the piece, the sonic environment changes, depending on one's location and the changing locations of the other participants.



Figure 19. *Stop on Line. Wait for Signal.* photos from a performance at UCSC, June 6, 2014.



Figure 20. *Stop on Line. Wait for Signal*, photos from a performance at UCSC, June 6, 2014.



Figure 21. *Stop on Line. Wait for Signal*, photos from a performance at UCSC, June 6, 2014.

134 Pacific

134 Pacific is also a walk-through piece, for the railings overlooking the ocean outside the UCSC Music Center. It uses the 134 resonant metal rails, which, when played by a large group of people, creates an enchanting and seemingly ascending sound cloud. There are two groups, one at either end of the terrace. The members of each group start one after another and move towards the center. The first persons in each group start together. Each person hits each rail, using their hands. Each plays a number of beats corresponding to their number in line (the first person hits each rail once, the second person twice, etc.) stressing the first beat in each rail. They try to keep a common beat throughout the piece, but due to the initial distance between the two groups they might not be synchronized with one another at first. As the piece progresses and they approach each other the beat gradually synchronizes.



Figure 22. *134 Pacific*, photos from a performance at UCSC, June 6, 2014.



Figure 23. *134 Pacific*, photos from a performance at UCSC, June 6, 2014.

Once the groups meet (i.e. the first persons in each group are standing next to each other) they lean their ear on the rails and listen for a while.



Figure 24. *134 Pacific*, photos from a performance at UCSC, June 6, 2014.



Figure 25. *134 Pacific*, photos from a performance at UCSC, June 6, 2014.

The complex sound resonance of the rails is now used as an alternative vocal score. Each performer chooses a discrete heard sound, and quietly starts humming it, while still hitting the rails. Gradually they stop hitting the rails, but keep humming, transforming the resonance of the rails into a vocal manifestation, slowly increasing and decreasing the volume, until the sound dissolves.



Figure 26. *134 Pacific*, photos from a performance at UCSC, June 6, 2014.

Music Box Office

Music Box Office, written for the staircase behind the Recital Hall box office, is a human music box, based on the *operation system* of a manual music box.

Each person chooses a sound, either from objects in the space or by using their body.

There are two groups: one group makes the sounds; the other is the “operating system,” indicating who plays and when. The first group stands along the staircase, and make their sounds only when a person from the other group steps on the same stair as they do. After one person goes up and down the stairs and introduces all the sounds, members of the second group move freely up and down, triggering specific sounds as they wish.



Figure 27. *Music Box Office*, photos from a performance at UCSC, June 6, 2014.

At any point members of the second group can quit and join the first group, by standing on a stair and choosing their own sound. Members of the first group can choose to change their sound in order to respond to others by moving to a different stair, or they can choose to join another person and share a stair, making multiple sounds occur simultaneously. They can also quit and join the second group at any time.



Figure 28. *Music Box Office*, photos from a performance at UCSC, June 6, 2014.

Members of the second group, the “operating system,” can sustain a sound by sitting on a stair corresponding to that sound. If the sound is short or percussive, the person who makes the sound simply repeats it. The piece ends when all members of the second group are seated, sustaining all sounds.



Figure 29. *Music Box Office*, photos from a performance at UCSC, June 6, 2014.

Photos credit: screen captures from CMMP video documentation by Danielle Williamson.

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