

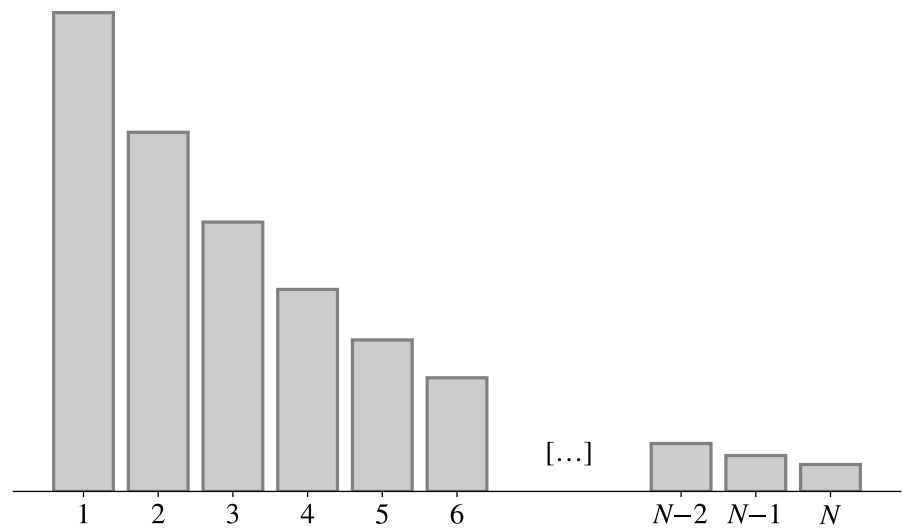
Gilberto Agostinho

Cartographies

2017-2020

Full Scores

All pieces in this series were composed using the following distribution:



$$P(n) = (3/4)^k \times P(n - k)$$

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Cartography #1, for piano and vibraphone

Mapping and rules

pitches

set size	$N = 6$
transformation period	$8 \times \text{♩}$
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with uniformly randomly selected g between F3 and E5 such that $g \bmod 12 \neq x \bmod 12, \forall x \in [a, b, c, d, e, f]$.
initial set	[G4, D4, Eb4, A4, F4, B4]

articulations

set size	$N = 6$
transformation period	no transformation.
set	$[\emptyset, \emptyset, \emptyset, >, >, \wedge]$, where \emptyset represents no articulation.
selection mechanism	accents are tied to pitches, so when a random index has been generated to select a pitch, this same index also selects an accent.

durations (vibraphone)

set size	$N = 8$
transformation period	$32 \times \text{♩}$
transformation mechanism	$[a, b, c, \dots, g, h] \rightarrow [a - 1, a - 2, a - 3, \dots, a - 7, a - 8]$, where an element equals to 1 if $a - k < 1$.
initial set	[10, 9, 8, 7, 6, 5, 4, 3]

durations (piano)

set size	$N = 8$
transformation period	$32 \times \text{♩}$
transformation mechanism	$[a, b, c, \dots, g, h] \rightarrow [a + 1, a, a - 1, \dots, a - 5, a - 6]$, where an element equals to 1 if $a - k < 1$.
initial set	[1, 1, 1, 1, 1, 1, 1, 1]

constraints

- number of pitch transformations: 40.
- number of duration transformations: 10.
- the piece begins with the vibraphone and the piano playing at the same time.
- the last note of the piano will dictate the last note of the vibraphone.

General performance notes

- all notes are notated as sixteenth-notes, but the effective durations are much longer due to the use of pedalling; that is, the notes represent the attack points only.
- this piece has no dynamic marks. Loudness is solely notated using marcato and martellato signs ($>$ and \wedge , respectively). Notes without articulations marks should be played as softly as possible (equivalent to *pp*), notes with a marcato sign should have a medium level of loudness (equivalent to *mf*) and notes with a martellato sign should have a high level of loudness (equivalent to *f*).
- the vibraphone's motor should remain off throughout the piece.
- the vibraphone's pedal should be held down throughout the piece; the performer may flush it ad libitum.
- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- after the last note of the piece, wait for a few seconds before raising the vibraphone's and piano's pedals.

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Cartography #1

Gilberto Agostinho

Example 1

Example 1 is a musical score for Vibraphone and Piano, marked "motor off". The tempo is indicated as $\text{♩} = \text{ca. } 84$. The score is in 2/4 time and consists of 12 measures. The Vibraphone part features a melodic line with eighth and quarter notes, often with rests, and includes a "Ped. →" marking. The Piano part provides a harmonic accompaniment with eighth and sixteenth notes, including triplets and dynamic markings such as *sf* (sforzando). The score is divided into three systems of four measures each, with measure numbers 6 and 12 indicated at the start of their respective systems.



Example 1 is a musical score for Vibraphone and Piano, marked "motor off". The tempo is indicated as $\text{♩} = \text{ca. } 84$. The score is in 2/4 time and consists of 12 measures. The Vibraphone part features a melodic line with eighth and quarter notes, often with rests, and includes a "Ped. →" marking. The Piano part provides a harmonic accompaniment with eighth and sixteenth notes, including triplets and dynamic markings such as *sf* (sforzando). The score is divided into three systems of four measures each, with measure numbers 6 and 12 indicated at the start of their respective systems.

18

sf *sf* *sf*

24

sf sf sf sf sf

30

sf

36

sf

42

sf

sf

48

sf

sf

sf

sf

sf

54

sf

sf

60

sf

sf

66

sf

sf

72

Musical score for measures 72-77. The system consists of two staves. The upper staff contains six measures of music, and the lower staff contains six measures. The music is in a key with one flat (B-flat) and a 2/4 time signature. It features a complex rhythmic pattern with many eighth and sixteenth notes, often beamed together. Dynamic markings include 'sf' (sforzando) in measure 75 of the lower staff. There are also various articulation marks like accents and slurs.

78

Musical score for measures 78-83. The system consists of two staves. The upper staff contains six measures of music, and the lower staff contains six measures. The music continues with the same complex rhythmic patterns. A 'sf' (sforzando) marking is present in measure 80 of the upper staff. The key signature remains one flat, and the time signature is 2/4.

84

Musical score for measures 84-89. The system consists of two staves. The upper staff contains six measures of music, and the lower staff contains six measures. The music continues with the same complex rhythmic patterns. A 'sf' (sforzando) marking is present in measure 85 of the lower staff. The key signature remains one flat, and the time signature is 2/4.

90

90

96

96

102

102

108

sf sf

114

sf sf sf sf sf

120

sf sf sf

126

Musical score for measures 126-131. The system consists of two staves. The upper staff features a complex melodic line with many beamed sixteenth and thirty-second notes, including accents and slurs. The lower staff provides a harmonic accompaniment with fewer notes, including some rests and slurs. A forte (*sf*) dynamic marking is present in measure 129.

132

Musical score for measures 132-136. The system consists of two staves. The upper staff continues the intricate melodic pattern with various accidentals and articulations. The lower staff continues the accompaniment. A forte (*sf*) dynamic marking is present in measure 136.

137

Musical score for measures 137-142. The system consists of two staves. The upper staff shows a continuation of the melodic line with some changes in articulation. The lower staff has more rests, with notes appearing in measures 137, 139, 141, and 142. A forte (*sf*) dynamic marking is present in measure 142.

143

sf sf sf sf sf sf sf

149

sf sf sf sf sf sf

155

sf sf sf sf sf sf

Cartography #2, for solo piano

Mapping and rules

pitches		constraints
set size	$N = 8$	<ul style="list-style-type: none"> number of pitch transformations: 50. number of duration transformations: 50.
transformation period	$8 \times \text{♪}$	
transformation mechanism	$[a, b, c, d, e, f, g, h] \rightarrow [b, c, d, e, f, g, h, i]$, with $i \bmod 12 = (h \bmod 12) - 1$, and i at a uniformly randomly selected octave transposition.	
initial set	$[G4, F\sharp4, F4, E4, E\flat4, D4, C\sharp4, C4]$	
dynamics		
set size	$N = 6$	
transformation period	no transformation.	
set	$[ppp, ppp, mf, mf, fff, fff]$	
durations		
set size	$N = 12$	
transformation period	$8 \times \text{♪}$	
transformation mechanism	swapping items from middle. For a set $[a, b, c, d, e, f, g, h, i, j, k, l]$, the first iteration swaps f and g , the second e and h , and so on, until the whole set is reversed. At that point, the process starts again, swapping from the middle of the reversed set.	
initial set	$[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12]$	

General performance notes

- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- after the last note of the piece, let the resonance disappear before raising the sustain pedal.

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Cartography #2

Gilberto Agostinho

$\text{♩} = \text{ca. } 72$

Piano

$\frac{1}{2}$ $\text{Red.} \rightarrow$

5

9

15

15

ppp *mf* *ppp* *mf* *ppp* *mf* *ppp* *fff*

13

15

fff *mf* *ppp* *mf* *fff* *ppp*

ppp *mf* *ppp* *fff*

17

15

mf *ppp* *mf* *ppp* *fff* *ppp* *ppp* *fff* *mf* *ppp*

ppp *fff* *ppp*

21

15

mf *ppp* *fff* *ppp* *mf* *ppp* *mf*

26

mf *ppp* *mf* *ppp* *ppp* *mf* *ppp* *ppp*

30

fff *fff* *ppp* *ppp* *ppp* *mf* *ppp* *mf*

34

ppp *mf* *mf* *ppp* *ppp* *mf* *ppp* *mf*

38

8-measure repeat

ppp

fff ppp

42

ppp fff mf

ppp

mf

ppp fff

ppp

8-measure repeat

ppp

46

fff

mf

ppp

mf

mf

fff ppp

ppp

8-measure repeat

50

ppp

ppp

fff

mf

8

54

ppp

fff

ppp

mf

ppp

mf

ppp

8

58

fff

ppp

mf

mf

mf

ppp

ppp

8

62

62-65: Treble staff dynamics: *mf*, *mf*, *fff*, *ppp*, *fff*, *ppp*, *fff*. Bass staff dynamics: *mf*, *ppp* (8⁻¹), *mf*, *fff* (8⁻¹), *ppp*, *fff* (8⁻¹).

66

66-69: Treble staff dynamics: *mf*, *ppp*, *ppp*, *fff*, *ppp*, *ppp*. Bass staff dynamics: *mf*, *ppp*, *mf* (8⁻¹), *ppp*, *mf* (8⁻¹), *ppp*.

70

70-73: Treble staff dynamics: *ppp*, *ppp mf ppp*, *mf*, *ppp fff*, *mf*, *ppp*. Bass staff dynamics: *fff* (8⁻¹), *ppp* (8⁻¹).

75

79

83

88

mf *ppp* *mf fff* *ppp* *mf* *ppp* *fff*

92

mf *ppp* *mf* *ppp* *mf*

96

ppp *fff* *mf* *ppp* *ppp* *ppp*

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Cartography #3, for solo guitar

Mapping and rules

number of notes per chord

set size	$N = 5$
transformation period	no transformation.
set	[1, 2, 3, 4, 0], where 0 represents a rest.

pitches

set size	$N = 4$
transformation period	every new note/chord event.
transformation mechanism	first, four random strings are selected. Barring is then uniformly randomly selected from the values {0-6}. After, the number of strings with fingered frets is uniformly randomly selected from the values {0-3}, and the fingered frets of a string can be one or two positions from the barred fret. There is a 20% of chance that the bottom note will be an unbarred E2. A set must also follow the constraints that no major or minor thirds are allowed between any two elements and that pitch classes must be unique in the set.

arpeggios for 3-note chords

set size	$N = 2$
transformation period	no transformation.
set	[false, true]

durations

set size	$N = 6$
transformation period	$6 \times \text{♪}$
transformation mechanism	randomizing the set [1, 2, 3, 4, 5, 6].
initial set	random.

dynamics

set size	$N = 6$
transformation period	no transformation.
set	[<i>pp</i> , <i>p</i> , <i>mp</i> , <i>mf</i> , <i>f</i> , <i>ff</i>]

constraints

- number of duration transformations: 40.
- no major thirds, minor thirds or perfect octaves are allowed between any two elements in a chord.
- barre position range from 0 to 6 frets.
- number of fingered strings range from 0 to 3.
- fingered strings range from 1 to 2 frets distance from bar.
- 2-note chords cannot have arpeggios.
- 4-note chords always have arpeggios.

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to Luciano Morais
Cartography #3

Gilberto Agostinho

$\text{♩} = \text{ca. } 96$

Guitar

III-
I
II
V

mf *f* *pp* *mf* *f* *pp* *f* *pp* *mp* *pp* *ff* *mp* *pp*

10 *f* *mp* *pp* *ff* *pp* *mp* *p* *pp* *ff* *pp*

20 *mp* *p* *pp* *mf* *f* *p* *ff* *pp* *mp* *p* *pp* *ff* *pp*

31

p mp pp mp pp mf f p pp mf

I^5 III_7

42

pp f pp mp mf f p f ff pp

V

52

ff f mp p mp mf

IV_7

63

p mp pp mf mf pp mf ff

V_7 V

Cartography #4, for flute, viola, and harp

Mapping and rules – first movement

tempi	
set size	$N = 5$
transformation period	no transformation.
set	$[\text{♩} = 48, \text{♩} = 54, \text{♩} = 60, \text{♩} = 66, \text{♩} = 72]$
pitches	
set size	$N = 8$
transformation period	$16 \times \text{♩}$
transformation mechanism	$[a, b, c, d, e, f, g, h] \rightarrow [b, c, d, e, f, g, h, i]$, with $i \bmod 12 = (h \bmod 12) - 1$, and i at a uniformly randomly selected octave transposition between a changing range (see range mechanism below). The set must respect the rule that there must be at least two pitches available for the defined range of the flute and viola (C5 to C6).
range mechanism	$C5-B6 \rightarrow C3-B6 \rightarrow C4-B6 \rightarrow C3-B6 \rightarrow C1-B6 \rightarrow C5-B6$, changing every 8 cycles.
selection mechanism	pitches outside the range of an instrument are ignored during the selection process.
initial set	$[C6, B5, B\flat5, A5, A\flat5, G5, F\sharp5, F5]$
durations (flute and viola)	
set size	$N = 5$
transformation period	no transformation.
set	$[4, 5, 6, 7, 8]$

constraints
<ul style="list-style-type: none"> number of duration and pitch transformations: 40. tempi are selected every second bar. harp durations are fixed throughout the movement, each note lasts for a quaver followed by a quaver rest the movement begins with all instruments playing at the same time. the range of the flute is defined as C5 to C6. the range of the viola is defined as C5 to C6. the range of the harp is defined as A♭1 to A6. all notes above and including F5 in the harp are played with octave harmonics. all instruments play at a very quiet dynamic level of pp throughout the movement. a note is replaced with a rest whenever the flute part had uninterrupted music for over 3 bars. every 10 cycles, the instruments rests for a bar and a half. the last note of the flute and the viola will have it duration extend as to last for the whole last measure. tempo set to $\text{♩} = 60$

Mapping and rules – second movement

pitches	
set size	$N = 8$
transformation period	$16 \times \text{♪}$
transformation mechanism	$[a, b, c, d, e, f, g, h] \rightarrow [b, c, d, e, f, g, h, i]$, with $i \bmod 12 = (h \bmod 12) + 1$, and i at a uniformly randomly selected octave transposition between a changing range (see range mechanism below). The set must respect the rule that there must be at least two pitches available for the defined range of the flute and viola (C4 to C5).
range mechanism	$C4-B4 \rightarrow C3-B4 \rightarrow C2-B4 \rightarrow C2-B6 \rightarrow C1-B6 \rightarrow C1-B6$, changing every 5 cycles.
selection mechanism	pitches outside the range of an instrument are ignored during the selection process.
initial set	$[Gb3, A3, Bb3, B3, C4, C\sharp4, D4, Eb4]$

durations (harp)	
set size	$N = 4$
transformation period	$16 \times \text{♪}$
transformation mechanism	first, a value n is selected from the set $[1, 2, 3, 4, 5, 6, 7, 8]$. Then a set durations for the harp is defined as $[n, n + 1, n + 2, n + 3]$.
initial set	randomly selected using the mechanism described above.

durations (flute and viola)	
set size	$N = 8$
transformation period	no transformation.
set	$[1, 2, 3, 4, 5, 6, 7, 8]$

constraints
<ul style="list-style-type: none"> • number of duration and pitch transformations: 30. • the movement begins with all instruments playing at the same time. • the range of the flute is defined as C4 to C5. • the range of the viola is defined as C4 to C5. • the range of the harp is defined as Ab1 to A6. • all notes above and including F5 in the harp are played with octave harmonics. • all instruments play at a very quiet dynamic level of pp throughout the movement. • the viola plays <i>sul pont. trem.</i> throughout this movement. • a note is replaced with a rest whenever the flute part had uninterrupted music for over 3 bars. • every 10 cycles, the instruments rests for a bar and a half. • the last note of the flute and the viola will have it duration extend as to last for the whole last measure. • tempo set to $\text{♪} = 76$

Mapping and rules – third movement

pitches		constraints	
set size	$N = 6$		
transformation period	$16 \times \text{♪}$		
transformation mechanism	$[a, b, c, d, e, \emptyset] \rightarrow [b, c, d, e, f, \emptyset]$, with $f \bmod 12 = (e \bmod 12) - 1$, and f at a uniformly randomly selected octave transposition. The element in the last index, \emptyset , represents rests and does not change. The set must respect the rule that there must be at least two pitches available for the defined range of the flute and viola; they both have a range of B♭6–B♭7 for the first 15 cycles and a range of C4–C5 (flute) and C3–C4 (viola) for the last 15 ones.		
selection mechanism	pitches outside the range of an instrument are ignored during the selection process.		
initial set	$[G6, F\sharp6, F6, E6, E\flat6, \emptyset]$, where \emptyset represents rests.		
16 th set	$[D4, C\sharp4, C4, B3, B\flat3, \emptyset]$, where \emptyset represents rests. This set overrides the previous container at the start of the 16 th cycle.		
durations			
set size	$N = 5$		
transformation period	no transformation.		
set	$[4, 5, 6, 7, 8]$		
			<ul style="list-style-type: none"> • number of duration and pitch transformations: 30. • the movement begins with all instruments playing at the same time. • the range of the flute is defined as B♭6 to B♭7 for the first 15 cycles, then as C4 to C5 for the last 15 ones. • the range of the viola is defined as B♭6 to B♭7 for the first 15 cycles, then as C3 to C4 for the last 15 ones. • the range of the harp is defined as A♭1 to A6. • all notes above and including F5 in the harp are played with octave harmonics. All notes above and including C6 in the flute are played as harmonics. All notes the viola above and including F5 are played as artificial harmonics. • all instruments play at a very quiet dynamic level of <i>pp</i> throughout the movement. • the viola plays <i>sul tasto</i> during the last 15 cycles. • a note is replaced with a rest whenever the flute part had uninterrupted music for over 3 bars. • every 15 cycles, the instruments rests for a bar and a half. • the last note of the flute and the viola will have it duration extend as to last for the whole last measure.

General performance notes

- all instruments should play at a very quiet dynamic level.
- tremolos are always unmeasured.
- the flute and viola part should sound as legato as possible
- the harpist should never damp any of the strings so that they are left vibrating as long as possible.

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Cartography #4

I

Gilberto Agostinho

Flute

$\text{♩} = 72$

$\text{♩} = 60$

$\text{♩} = 48$

pp

Viola

pp

simile

Harp

pp

G#, Bb

Bb

Gb

6

Fl.

$\text{♩} = 66$

Vla.

Hrp.

G#, Bb

Gb

Ab

Eb, Fb

F#

Eb

Eb

Eb, Fb

11

Fl.

Vla.

Hp.

$\text{♩} = 60$

$\text{♩} = 54$

F#, B \flat

C#, F \flat

C \sharp

C \sharp

16

Fl.

Vla.

Hp.

$\text{♩} = 48$

$\text{♩} = 54$

C \sharp

E \flat , B \flat

22

Fl. $\text{♩} = 66$ $\text{♩} = 48$

Vla.

Hp.

B \flat B \flat B \flat B \flat G \sharp

28

Fl. $\text{♩} = 60$ $\text{♩} = 48$

Vla.

Hp.

G \flat , B \flat D \flat , A \flat B \sharp A \flat C \sharp , A \flat

34

Fl.

Vla.

Hp.

$\text{♩} = 54$ $\text{♩} = 60$

E \flat E \flat , F \flat G \flat E \flat E \flat , B \flat C \flat , D \sharp

40

Fl.

Vla.

Hp.

$\text{♩} = 48$ $\text{♩} = 60$

B \flat C \sharp C \flat B \flat

46

Fl.

Vla.

Hp.

$\text{♩} = 54$

$\text{♩} = 48$

$\text{Db}, \text{A}\sharp$

$\text{A}\flat, \text{B}\flat$

$\text{G}\flat$

$\text{C}\flat$

$\text{A}\flat$

52

Fl.

Vla.

Hp.

$\text{♩} = 66$

$\text{♩} = 60$

$\text{D}\sharp, \text{A}\flat$

$\text{D}\sharp\text{--D}\flat$

$\text{A}\flat$

$\text{E}\flat$

*)

*) Pedal glissando, move the pedal at the exact moment the second note starts.

58 $\text{Fl.} = 48$ $\text{Vla.} = 66$

Fl.

Vla.

Hp.

D#-D \flat

64 $\text{Fl.} = 54$ $\text{Vla.} = 48$

Fl.

Vla.

Hp.

A \flat D#-D \flat D \flat -D# D#-D \flat A \flat G#, A \flat

70

Fl.

$\text{♩} = 66$

$\text{♩} = 54$

Vla.

Hp.

A#

E#, G#

G#

G#, A#

76 Fl. $\text{♩} = 60$ $\text{♩} = 48$

Vla.

Hp. G^\sharp G^\flat, B^\flat A^\flat A^\sharp

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15

Fl.

Vla.

Hp.

E \flat , A \flat , B \flat

23

Fl.

Vla.

Hp.

A \flat , B \flat

C \sharp , E \flat , F \sharp , A \sharp

31

Fl.

Vla.

Hp.

Double bar line with repeat dots

38

Fl.

Vla.

Hp.

Double bar line with repeat dots

46

Fl.

Vla.

Hp.

Ab, Bb

A \flat , B \flat

E \flat , A \sharp

C \sharp

54

Fl.

Vla.

Hp.

C \sharp , F \sharp , G \flat

III

Flute

Viola

Harp

$\text{♩} = \text{ca. } 60$

pp

pp

pp

simile

$\text{D}\flat$

$\text{E}\flat$

Fl.

Vla.

Hp.

Ch, G#

Ch, Db

15

Fl.

Vla.

Hp.

E \flat , B \flat

G \sharp

F \sharp

23

Fl.

Vla.

Hp.

D \sharp , F \sharp

31

Fl.

Vla.

Hp.

sul tasto

C#, Ab

Detailed description: This system contains measures 31 through 38. The Flute (Fl.) part begins with a melodic phrase in measures 31-32, followed by a series of eighth and sixteenth notes. The Viola (Vla.) part is mostly rests, with a 'sul tasto' instruction in measure 32, followed by a bass line of eighth and sixteenth notes. The Harp (Hp.) part features chords and single notes, with a specific chord marked 'C#, Ab' in measure 37. The system ends with a double bar line.

39

Fl.

Vla.

Hp.

Eb, Ab

Detailed description: This system contains measures 39 through 46. The Flute (Fl.) part continues the melodic line with various intervals and slurs. The Viola (Vla.) part continues the bass line with eighth and sixteenth notes. The Harp (Hp.) part continues with chords and single notes, with a specific chord marked 'Eb, Ab' in measure 43. The system ends with a double bar line.

46

Fl.

Vla.

Hp.

D#, F#

Bb

D#, Eb

54

Fl.

Vla.

Hp.

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Cartography #5, for violin and piano

Mapping and rules

pitches		durations (violin)	
set size	$N = 7$	set size	$N = 5$
transformation period	$16 \times \text{♪}$	transformation period	$128 \times \text{♪}$ (32 bars)
transformation mechanism	$[G3, a, b, c, d, e, f] \rightarrow [G3, b, c, d, e, f, g]$, with uniformly randomly selected g from the piano range such that $g \bmod 12 \neq x \bmod 12, \forall x \in [G3, a, b, c, d, e, f]$. The first element is fixed throughout the piece as the pitch G3. Also, the algorithm always ensures that there are at least three available notes in the violin range (G3 to A6). Finally, when selecting a pitch from the current set for the violin, the algorithm ensures that there are no skips larger than a major ninth (except for open strings).	transformation mechanism	$[a, a - 1, a - 2, \dots, a - 4] \rightarrow [a - 1, a - 2, a - 3, \dots, a - 5]$, where an element equals to 1 if $a - k < 1$.
initial set	$[G3, A\flat3, A3, B\flat3, B3, C4, C\sharp4]$	initial set	$[5, 4, 3, 2, 1]$
artifications		durations (piano)	
set size	$N = 7$	set size	$N = 5$
transformation period	no transformation.	transformation period	$128 \times \text{♪}$ (32 bars)
set	$[\emptyset, \emptyset, \emptyset, \emptyset, \succ, \succ, \wedge]$, where \emptyset represents no articulation.	transformation mechanism	$[a, a - 1, a - 2, \dots, a - 4] \rightarrow [a + 1, a, a - 1, \dots, a - 3]$, where an element equals to 1 if $a - k < 1$.
selection mechanism	accents are tied to pitches, so when a random index has been generated to select a pitch, this same index also selects an accent.	initial set	$[1, 1, 1, 1, 1]$
		constraints	
		<ul style="list-style-type: none"> number of pitch transformations: 40. number of duration transformations: 5. the piece begins with the violin and the piano playing at the same time. there are no intervals larger than a major ninth in the violin part (except when one of the notes is in an open string). 	

General performance notes

- this piece has no dynamic marks. Loudness is solely notated using marcato and martellato signs ($>$ and \wedge , respectively). Notes without articulations marks should be played as softly as possible (equivalent to *pp*), notes with a marcato sign should have a medium level of loudness (equivalent to *mf*) and notes with a martellato sign should have a high level of loudness (equivalent to *ff*).
- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- after the last note of the piece, let the resonance disappear before raising the sustain pedal.

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Cartography #5

Gilberto Agostinho

♩ = ca. 82

Violin

Piano

Violin: Treble clef, 4/8 time. Measures 1-5 contain a melodic line with eighth and quarter notes, some beamed together, and a fermata over the final measure.

Piano: Grand staff (treble and bass clefs), 4/8 time. Measures 1-5 contain a complex bass line with many beamed eighth notes and accidentals. A half note with a fermata and a rightward arrow is written below the first measure.



6

Violin: Treble clef, 4/8 time. Measures 6-11 continue the melodic line with various note values and accidentals.

Piano: Grand staff, 4/8 time. Measures 6-11 continue the complex bass line. A half note with a fermata and a rightward arrow is written above the first measure of this system.

12

12

18

18

24

Musical score for measures 24-29. The system consists of a grand staff with a treble and bass clef. The melody in the treble clef features a series of eighth and sixteenth notes, often beamed together, with some notes marked with a sharp (#) and others with a flat (b). The bass line is more complex, featuring a mix of eighth, sixteenth, and thirty-second notes, with some notes marked with a sharp (#) and others with a flat (b). There are several measures with a double bar line and a repeat sign (//) at the end of the system. The notation includes various musical symbols such as beams, slurs, and accidentals.

30

Musical score for measures 30-35. The system consists of a grand staff with a treble and bass clef. The melody in the treble clef continues with eighth and sixteenth notes, some marked with a sharp (#) and others with a flat (b). The bass line features a mix of eighth, sixteenth, and thirty-second notes, with some notes marked with a sharp (#) and others with a flat (b). There are several measures with a double bar line and a repeat sign (//) at the end of the system. The notation includes various musical symbols such as beams, slurs, and accidentals.

36

Musical score for measures 36-41. The system consists of a single treble staff and a grand staff (treble and bass). The key signature has one flat (B-flat). Measure 36 features a treble staff with eighth and sixteenth notes, including an accent and a sharp sign. The grand staff continues the melodic and harmonic development with various note values and rests. Measure 41 ends with a double bar line and repeat dots.

42

Musical score for measures 42-47. The system consists of a single treble staff and a grand staff (treble and bass). The key signature has one flat (B-flat). Measure 42 features a treble staff with eighth and sixteenth notes, including an accent and a sharp sign. The grand staff continues the melodic and harmonic development with various note values and rests. Measure 47 ends with a double bar line and repeat dots.

48

8

8

8

8

8

8

54

8

8

8

8

8

8

60

67

74

81

88

88

89

90

91

92

93

94

95

95

96

97

98

99

100

101

101

This system contains measures 101 through 106. The upper staff (treble clef) features a complex melodic line with many beamed eighth and sixteenth notes, including several trills marked with a sharp sign. The lower staff (bass clef) provides a harmonic accompaniment with eighth and sixteenth notes, some beamed together. Measure 105 includes an 8-measure rest in the upper staff, indicated by a dashed line and the number '8'. Measure 106 ends with a repeat sign.

107

This system contains measures 107 through 112. The upper staff continues the melodic development with beamed notes and trills. The lower staff continues the accompaniment. Measure 110 features an 8-measure rest in the upper staff, marked with a dashed line and the number '8'. Measure 112 ends with a repeat sign.

113

113

114

115

116

117

118

119

119

120

121

122

123

124

125

8

131

8 15

137

Musical score for measures 137-142. The system consists of a single treble staff and a grand staff (treble and bass staves). The treble staff contains a complex melodic line with many beamed sixteenth and thirty-second notes, including triplets and various accidentals (flats, naturals, sharps). The grand staff provides harmonic support with chords and moving lines in both the treble and bass registers. Measure 142 ends with a double bar line and repeat dots.

143

Musical score for measures 143-148. The system consists of a single treble staff and a grand staff (treble and bass staves). The treble staff continues the complex melodic line from the previous system, featuring many beamed sixteenth and thirty-second notes and various accidentals. The grand staff provides harmonic support with chords and moving lines in both the treble and bass registers. Measure 148 ends with a double bar line and repeat dots.

149

Musical score for measures 149-154. The system consists of a treble and bass staff. The treble staff contains a complex melodic line with many accidentals (sharps, flats, naturals) and slurs. The bass staff provides a harmonic accompaniment with various note values and rests. Measure 150 features a first ending bracket labeled '15' in the treble staff. Measure 151 features a second ending bracket labeled '15' in the treble staff. The system concludes with a repeat sign at the end of measure 154.

155

Musical score for measures 155-160. The system consists of a treble and bass staff. The treble staff continues the melodic line with many accidentals and slurs. The bass staff provides a harmonic accompaniment. Measure 156 features a first ending bracket labeled '15' in the treble staff. Measure 157 features a second ending bracket labeled '15' in the treble staff. The system concludes with a repeat sign at the end of measure 160.

Cartography #6, for piano four hands

Mapping and rules

pitches (top hands)

set size	$N = 6$
transformation period	$12 \times \text{♪}$
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) + 1$, and g at a uniformly randomly selected octave transposition within a given range. For the first half of the composition, this range is F4–B5, and for the second half it is C6–C8.
initial set	[F4, F♯4, G4, A♭4, A4, B♭4]
chance of chords	20%

pitches (bottom hands)

set size	$N = 6$
transformation period	$12 \times \text{♪}$
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) - 1$, and g at a uniformly randomly selected octave transposition within a given range. For the first and third quarters of the composition, this range is C3–E4, and for the second and last quarters it is A0–B2.
initial set	[E4, E♭4, D4, C♯4, C4, B3]
chance of chords	20%

articulations

set size	$N = 6$
transformation period	no transformation.
set	$[\emptyset, \emptyset, \emptyset, >, >, \wedge]$, where \emptyset represents no articulation.

durations

set size	$N = 4$
transformation period	$30 \times \text{♪}$
transformation mechanism	there are two mechanisms in use for the durations. The augmentation mechanism works as follows: $[a, b, c, d] \rightarrow [a + 1, b + 1, c + 1, d + 1]$, where an element equals to 1 if $x + 1 < 1$, $\forall x \in [a, b, c, \dots j]$. The diminishing mechanism works as follows: $[a, b, c, d] \rightarrow [a - 1, b - 1, c - 1, d - 1]$, where an element equals to 1 if $x - 1 < 1$, $\forall x \in [a, b, c, \dots j]$.
initial set (top hands)	[7, 8, 9, 10]
initial set (bottom hands)	[1, 1, 1, 1]
mechanism types	the top hands use the dim mechanism throughout the composition. The bottom hands use the aug mechanism in the first half of the composition and the dim mechanism in the last half.

constraints

- number of pitch transformations: 60.
- number of duration transformations: 12.
- ranges: bottom hands A0–E4, top hands F4–C8.

General performance notes

- this piece has no dynamic marks. Loudness is solely notated using marcato and martellato signs (> and ^ , respectively). Notes without articulations marks should be played soft (equivalent to *pp*), notes with a marcato sign should have a medium level of loudness (equivalent to *mf*) and notes with a martellato sign should have a high level of loudness (equivalent to *ff*).
- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- after the last note of the piece, hold the sustain pedal down for at least a couple of seconds before raising it.

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Cartography #6

Gilberto Agostinho

$\bullet = ca. 92$

I.

II.

8 $\frac{1}{2}$ $\text{Red.} \rightarrow$

3 8

8

5 8

8



7 8

8

9 ⁸

8



11 ⁸

8

13 ⁸

8



16 ⁸

8

19 ⁸

8



22 ⁸

8

25 ⁸

8

28 ⁸

8

31 ⁸

8



35 ⁸

8

39 ⁸

8

43 ⁸

8

47 ⁸

8

51 ⁸

8

55 ⁸

8

59 ⁸

8

63 ⁸

8

67 ⁸

8

71 ⁸

8

75 ⁸

8

79 ⁸

83 ⁸

87 ⁸

8

91 ⁸

8

95

8

99

8

103

8

106

8

109

8

112

8

115

8

118

8

121

8

124

8

127

8

130

8

133 8

8

136

8

138

8

140

8

143

8

146

8

149

8

151

8

153

8

155

8

157

8

8

159

8

8

161

Measures 161-165 of a musical score. The system consists of a grand staff with a treble and bass clef. The treble staff contains a complex melodic line with many beamed sixteenth and thirty-second notes, including accidentals (flats and sharps) and dynamic markings like accents (>) and breath marks (^). The bass staff provides a harmonic accompaniment with a mix of eighth and sixteenth notes, also featuring dynamic markings like accents and breath marks. A fermata is placed over the final measure of the system.

163

Measures 163-167 of a musical score. The system consists of a grand staff with a treble and bass clef. The treble staff continues the complex melodic line with beamed notes and various accidentals. The bass staff continues the accompaniment with rhythmic patterns. Dynamic markings such as accents and breath marks are present throughout. A fermata is placed over the final measure of the system.

165

8

167

8

169

8

171

8

173

8

175

8

177

8

179

8

Cartography #7, for four electric guitars

Mapping and rules

cells		pitches	
set size	$N = 5$	set size	$N = 7$
transformation period	$48 \times \text{♩}$	transformation period	$8 \times \text{♩}$
possible values	1 : note with cresc. from al niente, 2 : tap harmonic, 3 : group of n consecutive sixteenth-notes (n selected from $[2, 3, 4, 5, 6]$), 4 : note with vibrato, 5 : single regular note, 6 : mixed group of m consecutive sixteenth-notes, the last one with a vibrato (m selected from $[4, 5, 6, 7, 8]$.)	transformation mechanism	$[a, b, c, d, e, f, g] \rightarrow [b, c, d, e, f, g, h]$, with $h \bmod 12 = (g \bmod 12) - 1$, and h at a uniformly randomly selected octave transposition.
transformation mechanism	There are four stages for the transformation mechanism of the cells. The first four transformations are given by $[a, b, c, d, e] \rightarrow [b, c, d, e, e + 1]$. The next four are given by $[a, b, c, d, e] \rightarrow [b, c, d, e, a]$. The next five are given by $[a, b, c, d, e] \rightarrow [b, c, d, e, 6]$. The final five transformations are given by $[a, b, c, d, e] \rightarrow [b, c, d, e, f]$, where $f = (e \bmod 6) + 1$.	initial set	$[C6, B5, Bb5, A5, Ab5, G5, F\sharp5]$
initial set	$[1, 1, 1, 1, 1]$	durations	
		set size	$N = 5$
		transformation period	$48 \times \text{♩}$
		transformation mechanism	there are three mechanisms in use. For the first thirteen transformations: $[a, b, c, d, e] \rightarrow [a - 1, b - 1, c - 1, d - 1, e - 1]$. From the fourteenth transformation until the coda: $[a, b, c, d, e] \rightarrow [a + 1, b + 1, c + 1, d + 1, e + 1]$. The coda starts one bar after the last active note ends and uses a fixed set $[24, 24, 24, 24, 24]$ for all four electric guitars.
		initial set	$[28, 27, 26, 25, 24]$
		constraints	
		<ul style="list-style-type: none"> • number of pitch transformations: $216 + 1$ for the coda. • number of duration transformations: $18 + 1$ for the coda. • range: E3–E6. • if a pitch below D4 is selected, harmonics mode cannot be selected. • there is always a sixteenth-note rest between a vibrato mode note and the next note. 	

General performance notes

- each guitar player should have their own amplifier by the their sit. They should sit at maximal distance from each in order to emphasize the spatial aspect of the composition.
- use a clean guitar sound and soft dynamics throughout the piece.
- notes with *laissez vibrer* ties should last as long as possible but end before the next note.
- all volume changes should be executed with a volume pedal.
- all harmonics should be executed as artificial harmonics and are notated at sounding pitch. They should all be played as tap harmonics in order to achieve a slightly more pronounced attack than a regular pinch harmonic (but still in soft dynamic).
- the vibrato should be executed as fast as possible but within a small frequency range.
- do not add vibrato to any note without a *vib.* indication.
- the performers may want to add a little bit of reverb pedal since that may help with the let it ring effect.
- the performers may also consider using a compressor to help with the tap harmonic sounds, though do that with caution and respecting the overall soft dynamic of this composition.

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Cartography #7

Gilberto Agostinho

♩ = ca. 88

Electric Guitar #1

Electric Guitar #2

Electric Guitar #3

Electric Guitar #4

9

The musical score is written for four electric guitars. It begins with a tempo indication of approximately 88 bpm. The first system contains measures 1 through 8, and the second system contains measures 9 through 16. The notation is complex, featuring many beamed eighth notes and quarter notes. Dynamic markings 'p' are used frequently. Fingering numbers like '8-1' are indicated above some notes. The key signature has one flat (Bb).

17

8va

p

25

8va

p

32

Measures 32-39. The score is written for four staves. Measures 32-39 show various musical notations including eighth notes, quarter notes, and rests, with dynamic markings *p* (piano) and articulation marks. Measure 38 features a trill marked *8-1*.

40

Measures 40-47. The score is written for four staves. Measures 40-47 show various musical notations including eighth notes, quarter notes, and rests, with dynamic markings *p* (piano) and articulation marks. Measures 41, 43, 45, and 47 feature trills marked *8-1*. Measures 42, 44, and 46 feature vibrato markings *vib.*.

[illegible]

54

8

8

8

8

p

p

p

vib.

p

[illegible][illegible]

[illegible]

[illegible][illegible]

98

8va

8

8

8

p

p

p

vib.

104

8va

8

8

8

p

p

p

vib.

p

p

[illegible]

116

Violin I: *p*

Violin II: *p*

Viola: *p*

Cello/Double Bass: *p*

Vibrato markings: *vib.*

Octave markings: *8^{va}*

122

Handwritten musical score for 'The Rose Tree'. The score is written on four staves, each with a treble clef and a key signature of one flat (B-flat). The first staff begins with a measure number '122'. The music features various notes, rests, and dynamic markings. The word 'vib.' (vibrato) is written above several notes. The score is divided into measures by vertical bar lines. The notation includes eighth notes, quarter notes, and half notes, along with rests and accidentals (sharps and flats). The overall style is that of a handwritten musical manuscript.

[illegible]

131

8¹ vib. 8¹ vib. 8¹ vib. 8¹ vib.

136

8¹ vib. 8¹ vib. 8¹ vib. 8¹ vib.

140

vib.

vib.

vib.

vib.

144

vib.

vib.

vib.

vib.

148

148

149

150

151

152

152

153

154

155

156

Four staves of music, measures 156-159. The notation includes eighth notes, sixteenth notes, and dotted rhythms. Vibrato markings (*vib.*) are present above many notes. A bracket with the number 8 is placed above the first staff in measures 156, 157, and 159.

160

Four staves of music, measures 160-163. The notation includes eighth notes, sixteenth notes, and dotted rhythms. Vibrato markings (*vib.*) are present above many notes. A bracket with the number 8 is placed above the first staff in measures 160, 161, and 162.

164

164

165

166

167

168

168

169

170

171

172

172

8

vib.

p

8

vib.

vib.

vib.

vib.

8

p

8

vib.

8

vib.

p

176

176

8

vib.

p

8

vib.

vib.

vib.

vib.

8

p

8

vib.

8

vib.

p

180

This system contains measures 180 through 183. It is written for four staves. The key signature has one flat (B-flat). The notation includes frequent vibrato markings (wavy lines above notes) and eighth-note patterns. Dynamics include piano (*p*) and fortissimo (*ff*). Measure 180 starts with a piano (*p*) dynamic. Measure 181 features a fortissimo (*ff*) dynamic. Measure 182 has a piano (*p*) dynamic. Measure 183 ends with a fortissimo (*ff*) dynamic. The staves are numbered 8, 8, 8, and 8 from top to bottom.

184

This system contains measures 184 through 187. It is written for four staves. The key signature has one flat (B-flat). The notation includes frequent vibrato markings (wavy lines above notes) and eighth-note patterns. Dynamics include piano (*p*) and fortissimo (*ff*). Measure 184 starts with a piano (*p*) dynamic. Measure 185 features a fortissimo (*ff*) dynamic. Measure 186 has a piano (*p*) dynamic. Measure 187 ends with a fortissimo (*ff*) dynamic. The staves are numbered 8, 8, 8, and 8 from top to bottom.

[illegible][illegible]

[illegible][illegible]

[illegible]

213

8

vib.

vib.

vib.

p

vib.

219

vib.

p

8-1

p

vib.

p

8-1

p

vib.

8-1

p

vib.

8-1

p

[illegible]

Cartography #8, for flute, soprano sax, violin, violoncello, and accordion

Mapping and rules

pitches		dynamics	
set size	$N = 6$	set size	$N = 2$
transformation period	$2 \times \text{bars}$	transformation period	$17 \times \text{bars}$
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) + 1$, and g at a uniformly randomly selected octave transposition.	transformation mechanism	$[a, b] \rightarrow [b, c]$, with $c = b + 1$.
initial set	$[A5, Bb5, B5, C6, C\sharp6, D6]$	initial set	$[pp, p]$
bar lengths		techniques	
set size	$N = 3$	set size	$N = 2$
transformation period	$8 \times \text{bars}$	transformation period	fixed
transformation mechanism	$[a, b, c] \rightarrow [b, c, d]$, with $d = c - 1$.	initial set	[option 1, option 2], with the option 1 being ord. for all instruments and 8'+8' registration for the accordion, and option 2 being flageolet for flute, bisbigliando for saxophone, sul ponticello for violin and violoncello and 8'+8'+4' for accordion.
initial set	$[7, 6, 5]$		
number of instruments playing in a given bar		constraints	
set size	$N = 6$	<ul style="list-style-type: none"> number of bars (pre-loop): 40. durations: all notes last a whole bar. range: Ab4–E7. Highest pitches: flute C7, soprano saxophone Eb6, violin E7 (harmonics from E6 and above), violoncello E7 (harmonics from G5 and above) and at least one pitch in a pitch set should be equal to or below C6. looping mechanism follows three processes to select which of the 40 bars are output. First process outputs $1 \rightarrow 1, 2 \rightarrow 1, 2, 3 \rightarrow \dots \rightarrow 1, 2, 3, \dots, 8, 9, 10$, second process outputs $2, 3, 4, 5, \dots, 9, 10, 11 \rightarrow 3, 4, \dots, 11, 12 \rightarrow \dots \rightarrow 31, 32, \dots, 39, 40$, and the third process outputs $32, 33, 34, \dots, 39, 40 \rightarrow 33, 34, \dots, 39, 40 \rightarrow 34, \dots, 39, 40 \rightarrow \dots \rightarrow 39, 40 \rightarrow 40$. 	
transformation period	fixed		
set	$[5, 4, 3, 2, 1, 0]$		
instrumentation	uniformly randomly selected		
hairpins			
set size	$N = 3$		
transformation period	fixed		
initial set	$[\text{none}, \text{cresc.}, \text{dim.}]$		
end dynamic	always one level above or below the initial dynamic.		

General performance notes

- s.p. stands for sul ponticello.
- flute harmonics should preferably be fingered two octaves below (i.e. third overtone) whenever possible.
- saxophone bisbigliando is notated with the written instruction *bisbi.* followed by a wavy line. Bisbigliando should be performed at medium to fast speed.
- all performers should play without vibrato.

to Ensemble Terrible

$\text{♩} = ca. 88$

Gilberto Agostinho

[illegible]

92

Fl. $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{7}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$

Sax $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{7}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$

Vln. $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{7}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$

Vcl. $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{7}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$

Acc. $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{7}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$

bisbi.

ord.

s.p.

pp *p* *pp* *ppp* *p* *pp* *pp* *p* *pp* *pp* *p* *pp* *ppp* *p* *pp*

104

Fl. $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$

Sax $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$

Vln. $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$

Vcl. $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$

Acc. $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$

bisbi.

ord.

s.p.

pp *p* *pp* *ppp* *p* *pp* *pp* *p* *pp* *ppp* *p* *pp* *ppp* *p* *pp*

116

Fl. $\frac{3}{4}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{2}{4}$

Sax

Vln.

Vcl.

Acc.

p pp *p* pp *pp* pp *p* pp *ppp* *pp* ppp

bisbi.

s.p. *ord.* *s.p.* *ord.* *s.p.* *ord.* *s.p.* *ord.* *s.p.* *ord.*

pp *p* mp *pp* *p* pp *p* mp *pp* *p* pp *p* pp *p* mp

pp *pp* *p* ppp *p* pp *p* pp *p* pp *pp* *pp*

pp ppp *p* pp ppp *p* pp ppp *p* pp ppp *p* pp ppp *p* pp

128

Fl. $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$

Sax

Vln.

Vcl.

Acc.

p pp *p* pp ppp *pp* ppp *p* pp *p* pp *p* pp *p* pp

bisbi.

pp pp *p* pp *p* mp *pp* ppp *pp* *p* mp *pp* pp *p* mp

s.p. *ord.* *s.p.* *ord.* *s.p.* *ord.* *s.p.* *ord.* *s.p.* *ord.*

pp *p* pp *p* pp *p* pp *p* pp *p* pp *p* pp *p* pp

pp *pp* *p* ppp *p* pp *p* pp *p* pp *p* pp *p* pp *p* pp

pp ppp *p* pp ppp *p* pp ppp *p* pp ppp *p* pp ppp *p* pp

141

Fl. $\frac{3}{4}$ $\frac{5}{8}$ $\frac{2}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{2}{4}$

Sax $pp > ppp$ pp $p < mp$ $pp < p$ $pp < p$ pp $p < mp$ $pp > ppp$ pp $p < mp$

Vln. pp $ord.$ p pp $s.p.$ $ord.$ p pp $s.p.$ $ord.$ p

Vcl. $p > pp$ $p > pp$ $p > pp$ mp pp p $pp > ppp$ $p > pp$ $p > pp$ $p > pp$

Acc. p mp pp ppp $p > pp$ p mp

bisbi.

154

Fl. $\frac{3}{4}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{3}{4}$

Sax $mp < mf$ $mp < mf$ pp $p > pp$ ppp $pp > ppp$ $p > pp$ $mp < mf$ $mp < mf$ $mp < mf$

Sax p $pp < p$ pp $p < mp$ $pp > ppp$ pp $p < mp$ p $p > pp$

Vln. pp $s.p.$ $ord.$ p pp $s.p.$ $ord.$ p pp $s.p.$ $ord.$ pp

Vcl. mp mf pp p $pp > ppp$ $p > pp$ $p > pp$ $p > pp$ mp mf pp $p < p$

Acc. $p > pp$ ppp $p > pp$ p p mp $p > pp$ $p > pp$ $p > pp$

bisbi.

193

Fl. $\frac{2}{4}$ $\frac{5}{8}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{2}{4}$ $\frac{1}{4}$

Sax *bisbi.~~~~~*

Vln. *ord.*

Vcl. *s.p.*

Acc. *8.1*

mp < mf *pp > ppp* *pp > ppp* *p > pp* *mp < mf* *mp < mf* *mp < mf* *mp < mf* *mp < mf* *mp < mf* *mp < mf*

p < mp *pp* *p < mp* *p* *p < mp* *p* *p < mp* *p* *p < mp* *p* *mp*

p < mp *pp* *p* *p > pp* *mp* *p > pp* *mf* *mp* *p < mp* *p* *mp*

p *mp* *p > pp* *p > pp* *mp < mf* *mp < mf*

206

Fl. $\frac{2}{4}$ $\frac{3}{8}$ $\frac{2}{4}$ $\frac{1}{4}$ $\frac{2}{4}$

Sax *bisbi.~~~~~*

Vln. *ord.*

Vcl. *s.p.*

Acc. *8.1*

pp > ppp *p > pp* *mp < mf* *mp < mf* *mp < mf* *mp < mf* *mp < mf* *mp < mf* *mp < mf* *mp < mf* *mp < mf* *mp < mf*

p < mp *p* *p < mp* *p* *p < mp* *p* *p < mp* *p* *p < mp* *p* *p* *p*

ord. *s.p.* *p < mp* *p > pp* *ord.* *s.p.* *p > pp* *mp* *mp* *p < mp* *p > pp*

p *mp* *mf* *mp* *mp < mf* *mp* *p < mp* *p* *p > pp*

219

Fl. $\frac{3}{8}$ $\frac{2}{4}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{2}{4}$

Sax *bisbi.*

Vln. $p < mp$ $p > pp$ $p < mp$

Vcl. mp $p > pp$ mp mf mp

Acc. $p > pp$ $mp < mf$ mp mp $p > pp$ $p > pp$

232

Fl. $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{2}{4}$ $\frac{1}{4}$ $\frac{2}{4}$

Sax *bisbi.*

Vln. $p > pp$ $p < mp$ $p > pp$

Vcl. $p > pp$ $p < mp$ mf mp $p > pp$ $p < mp$

Acc. $mp < mf$ mp p pp $p > pp$ $mp < mf$ mp p

258.

Fl.

Sax

Vln.

Vcl.

Acc.

1/4 2/4 3/8 1/4 2/4 1/4

bisbi.

mp *p* *mp* *p* *mp* *p* *mp* *p* *mp* *p* *mp* *p*

p *mf* *pp* *p* *mf* *p* *pp* *p* *mf* *pp* *p* *mf* *pp*

297

2/4 3/8 1/4 2/4 3/8 1/4 1/8 1/4 2/4 3/8 1/4

Fl. *bisbi.* *p* < *mp* *p* < *mp* *p* < *mp* *bisbi.* *mp* > *p* *bisbi.* *p* < *mp*

Sax *mp* *p* *mp* *p* *p* < *mp* *mp* < *mf* *mp* *p* ord. *mp*

Vln. *mp* *mf* *p* *p* s.p. *mf* *mf* *mp* *mf*

Vcl. *p* < *mp* *p* < *mp* *p* ord. *mp* < *mf* *p* < *mp* *p* < *mp* *p* < *mp*

Acc. *p* *mp* *p* *mp* *p* *mp* *p* *mp*

310

2/4 3/8 1/4 1/8 1/4 2/4 3/8 1/4 2/4 3/8 1/4

Fl. *p* < *mp* *p* < *mp* *bisbi.* *mp* > *p* *mf* *bisbi.* *p* < *mp* *p* < *mp* *p* < *mp* *bisbi.*

Sax *p* *p* < *mp* *mp* < *mf* *mp* *p* ord. *mp* *p* *p* < *mp*

Vln. *p* *p* s.p. *mf* *mp* *mp* *mp* *mf* *p*

Vcl. ord. *p* s.p. *mf* *p* < *mp* *p* < *mp* *p* < *mp* *p* ord. *p* s.p. *p* < *mp*

Acc. *p* *mp* *p* *mp* *p* *mp* *p* *mp*

323.

Fl. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$

Sax $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$

Vln. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$

Vcl. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$

Acc. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$

Fl. $mp > p$ mf $p < mp$ $p < mp$ $p < mp$ $mp > p$ mf mp

Sax $mp < mf$ p mp p $p < mp$ $mp < mf$ $mp < mf$

Vln. mf mp mf p p mf mp

Vcl. mp mf p mp mp mf mp

Acc. mp $p < mp$ p mp mf

bisbi.~~~~~

ord.

s.p.

336.

Fl. $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$

Sax $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$

Vln. $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$

Vcl. $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$

Acc. $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{2}{4}$ $\frac{3}{8}$ $\frac{1}{4}$

Fl. $p < mp$ $p < mp$ $p < mp$ $mp > p$ mf mp $mp > p$ mf mp $p < mp$ $p < mp$

Sax mp p $p < mp$ $mp < mf$ $mp < mf$ mp p $ord.$ $p < mp$

Vln. mf p p mf mp mp p $ord.$ p

Vcl. mp mf mp mp mp mp mp mp mp

Acc. p mp mf $mp < mf$ p

bisbi.~~~~~

ord.

s.p.

349

Fl. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$

Sax $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$

Vln. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$

Vcl. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$

Acc. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$

mp $\text{mp} > p$ *mf* *mp* *bisbi.~~~~~* *p* $\text{p} < \text{mp}$ *bisbi.~~~~~* $\text{mp} > p$ *mf*

mp $\text{mp} < \text{mf}$ *mp* $\text{mp} < \text{mf}$ *mp* $\text{mf} < f$ *p* $\text{p} < \text{mp}$ $\text{mp} < \text{mf}$

mf *mp* *ord.* *p* *s.p.* *mf*

mf $\text{mf} < f$ $\text{mp} < \text{mf}$ *p*

mp *mf* $\text{mp} < \text{mf}$ $\text{mp} < \text{mf}$ *p* *mp*

362

Fl. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$

Sax $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$

Vln. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$

Vcl. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$

Acc. $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{8}$

mp *bisbi.~~~~~* *mp* $\text{mp} > p$ *mf* *mp* *bisbi.~~~~~* $\text{mp} > p$

mp $\text{mp} < \text{mf}$ *mp* $\text{mf} < f$ *p* $\text{p} < \text{mp}$ $\text{mp} < \text{mf}$ $\text{mp} < \text{mf}$ $\text{mf} < f$ $\text{mp} < \text{mf}$

mp *ord.* *p* *s.p.* *mf* *mp* *ord.* *mf*

mf $\text{mf} < f$ $\text{mp} < \text{mf}$ *p* *mf* $\text{mp} < \text{mf}$ $\text{mp} < \text{mf}$ $\text{mf} < f$ *mp*

mf $\text{mp} < \text{mf}$ $\text{mp} < \text{mf}$ *p* *mp* *mf* $\text{mp} < \text{mf}$ $\text{mp} < \text{mf}$ *mp*

Cartography #9, for clarinet, viola, vibraphone, and piano

Mapping and rules

pitches		durations	
set size	$N = 6$	set size	$N = 5$
transformation period	$1 \times \text{bar}$ (pre-loop)	transformation period	$2 \times \text{bars}$ (pre-loop)
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) + 1$, and g at a uniformly randomly selected octave transposition. At every sixth bar (pre-loop), the whole set of six pitches is replaced by a new one in which each new pitch is uniformly randomly selected within the instrumental range and making sure that each pitch class is unique. The process of selecting a new pitch after that will continue to follow $g \bmod 12 = (f \bmod 12) + 1$, and g .	transformation mechanism	$[a, b, c, d, e] \rightarrow [b, c, d, e, f]$, with $f = e - 1$.
initial set	$[C4, C\sharp4, D4, E\flat4, E4, F4]$	initial set	$[10, 9, 8, 7, 6]$
dynamics		looping mechanism	
set size	$N = 5$	window size	$16 \times \text{♪}$ (post-loop)
transformation period	fixed	shift size	semiquaver
set	$[ppp, pp, p, mp, mf]$	mechanism	the algorithm first creates a non-looped version of the music using the maps and transformation mechanisms to select pitches, durations and dynamics as described above. After this music is generated, the next stage is to use a 16 semiquavers-long window which is shifted to the right by a single semiquaver after every cycle. The processes ends when the last note of the pre-looped music leaves the looping window.
selection mechanism	the dynamics map is tied to the duration map, so that a same random index is used to select elements from both. For instance, if the duration at the first index has been selected, the dynamic <i>ppp</i> is then also selected.	constraints	
		<ul style="list-style-type: none"> number of bars (pre-loop): 12. range: F3–Bb5. 	

General performance notes

- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- the vibraphone's pedal should be held down throughout the piece.
- after the last note of the piece, both the vibraphone and the piano should let the resonance disappear before raising the sustain pedal.
- the vibraphone's motor should remain off throughout the piece.
- medium mallets are recommended for the vibraphone.
- both the clarinet and viola should play without vibrato.
- the clarinettist should add breathing points after longer notes but preferably not at bar lines.
- if necessary, the clarinettist may take up to two bars of rest at any point in the performance (at the discretion of the performer).
- the viola should use a mute throughout this piece.
- the viola player may decide to play any notes in the piece using harmonics, in particular when that helps with larger leaps.

Cartography #9

Score in C

$\text{♩} = ca. 80$

Gilberto Agostinho

Clarinet in B \flat

Viola

Vibraphone

Piano

The image shows a musical score for four instruments: Clarinet in B \flat , Viola, Vibraphone, and Piano. The music is in 4/4 time and consists of five measures. The Clarinet part features a melodic line with dynamics *p*, *mf*, and *pp*. The Viola part is marked 'con sord.' and has dynamics *mp*, *p*, and *pp*. The Vibraphone part is marked 'motor off' and has dynamics *ppp* and *pp*. The Piano part has dynamics *p*, *mp*, and *ppp*, and includes a 'Ped.' (pedal) instruction with an arrow pointing to the right. The score is written on staves with treble and bass clefs, and includes various musical notations such as notes, rests, and slurs.

Cl.

Vla.

Vib.

Pno.

11

Cl. *mf pp*

Vla. *pp p*

Vib. *pp ppp*

Pno. *mp ppp mf mp ppp mf mp ppp mf mp ppp mf mp ppp mf*

16

Cl. *mf pp*

Vla. *pp p*

Vib. *ppp pp*

Pno. *ppp mf ppp mf ppp mf ppp mf ppp mf ppp*

21

Cl. *pp* *mf* *pp* *mf* *pp* *mf* *pp* *mf*

Vla. *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p*

Vib. *ppp* *pp* *ppp* *pp* *ppp* *pp* *mf* *ppp* *pp* *mf* *ppp* *pp* *mf*

Pno. *mf* *ppp* *mf* *ppp* *mf* *ppp* *mf* *ppp* *mf* *ppp* *mf* *ppp*

27

Cl. *pp* *mf* *pp* *mf* *p* *pp* *mf* *p* *pp* *mf* *p* *pp* *mf* *p*

Vla. *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p*

Vib. *ppp* *pp* *mf* *ppp* *pp* *mf* *ppp* *pp* *mf* *pp* *mf* *pp* *mf*

Pno. *mf* *ppp* *mf* *ppp* *mf* *ppp* *mf* *ppp* *mf* *ppp* *mf* *ppp*

32

Cl. *pp mf p mf p mf p mf*

Vla. *pp p pp p mf pp p mf pp p mf pp p mf*

Vib. *pp mf pp mf pp mf pp mf pp mf pp mf*

Pno. *p*

37

Cl. *mf p mf p mf p mf ppp mf p mf ppp*

Vla. *pp p mf mp pp p mf mp pp p mf mp p mf mp*

Vib. *mf pp mf pp mf pp mf pp mf pp*

Pno. *ppp p ppp p ppp p ppp p*

42

Cl.

Vla.

Vib.

Pno.

Measure 42: Cl. (*mf*, *p*, *mf*, *ppp*), Vla. (*p*, *mf*, *mp*), Vib. (*mf*, *pp*, *p*), Pno. (*ppp*, *p*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*).

Measure 43: Cl. (*p*, *mf*, *ppp*), Vla. (*p*, *mf*, *mp*), Vib. (*mf*, *pp*, *p*), Pno. (*ppp*, *p*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*).

Measure 44: Cl. (*p*, *mf*, *ppp*), Vla. (*p*, *mf*, *mp*), Vib. (*mf*, *pp*, *p*), Pno. (*ppp*, *p*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*).

Measure 45: Cl. (*p*, *mf*, *ppp*), Vla. (*p*, *mf*, *mp*), Vib. (*mf*, *pp*, *p*), Pno. (*ppp*, *p*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*).

Measure 46: Cl. (*p*, *mf*, *ppp*), Vla. (*p*, *mf*, *mp*), Vib. (*mf*, *pp*, *p*), Pno. (*ppp*, *p*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*).

47

Cl.

Vla.

Vib.

Pno.

Measure 47: Cl. (*p*, *mf*, *ppp*), Vla. (*mf*, *mp*, *p*), Vib. (*mf*, *pp*, *p*), Pno. (*ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*).

Measure 48: Cl. (*p*, *mf*, *ppp*), Vla. (*mf*, *mp*, *p*), Vib. (*mf*, *pp*, *p*), Pno. (*ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*).

Measure 49: Cl. (*p*, *mf*, *ppp*), Vla. (*mf*, *mp*, *p*), Vib. (*pp*, *p*, *pp*), Pno. (*ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*).

Measure 50: Cl. (*mf*, *ppp*, *p*), Vla. (*mf*, *mp*, *p*), Vib. (*pp*, *p*, *pp*), Pno. (*ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*).

Measure 51: Cl. (*mf*, *ppp*, *p*), Vla. (*mf*, *mp*, *p*), Vib. (*pp*, *p*, *pp*), Pno. (*ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*, *ppp*, *p*, *mf*).

52

Cl. *mf ppp* *p* *mf ppp* *p* *mf ppp* *ppp* *p* *ppp* *p* *pp*

Vla. *mf mp* *p* *mp* *p* *mp* *p* *mp* *p* *mp* *ppp*

Vib. *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp*

Pno. *p* *mf* *pp* *p* *mf* *pp* *p* *mf* *pp* *p* *mf* *pp* *ppp*

57

Cl. *ppp* *p* *pp* *ppp* *p* *pp* *ppp* *p* *pp* *ppp* *p* *pp* *ppp* *p* *pp*

Vla. *mp* *p* *mp* *ppp* *mp* *p* *mp* *ppp* *p* *mp* *ppp* *p* *mp* *ppp* *p* *mp* *ppp*

Vib. *p* *pp* *mf* *p* *pp* *mf* *p* *pp* *mf* *p* *pp* *mf* *p* *pp* *mf* *p*

Pno. *p* *mf* *pp* *ppp* *mf* *pp* *ppp* *mf* *pp* *ppp* *mf* *pp* *ppp* *mf* *pp* *ppp* *mf* *pp* *ppp*

63

Cl.

Vla.

Vib.

Pno.

Dynamic markings: *ppp*, *p*, *pp*, *mp*, *mf*.

69

Cl.

Vla.

Vib.

Pno.

Dynamic markings: *p*, *pp*, *ppp*, *mp*, *mf*.

74

Cl. *pp ppp p*

Vla. *ppp p mf*

Vib. *mf p mp pp*

Pno. *ppp p ppp p ppp p ppp p*

79

Cl. *p ppp*

Vla. *p mf pp*

Vib. *p mp pp*

Pno. *p ppp p ppp p ppp p*

84

Cl.

Vla.

Vib.

Pno.

Dynamic markings for measures 84-88:

- Cl.:** *p*, *ppp*, *p*, *ppp*, *pp*, *p*, *ppp*, *pp*, *p*, *ppp*, *pp*
- Vla.:** *p*, *mf*, *pp*, *ppp*, *mf*, *pp*, *ppp*, *mf*, *pp*, *ppp*, *mf*, *pp*, *ppp*
- Vib.:** *mp*, *pp*, *mp*, *pp*, *mp*, *pp*, *ppp*, *pp*, *pp*, *ppp*, *pp*, *ppp*
- Pno.:** *p*, *ppp*, *p*, *ppp*, *p*, *ppp*, *p*, *ppp*, *p*, *ppp*, *p*

89

Cl.

Vla.

Vib.

Pno.

Dynamic markings for measures 89-93:

- Cl.:** *p*, *ppp*, *pp*, *p*, *ppp*, *pp*, *mp*, *ppp*, *pp*, *mp*, *ppp*, *pp*, *mp*
- Vla.:** *mf*, *pp*, *ppp*, *mf*, *pp*, *ppp*, *mf*, *pp*, *ppp*, *mf*, *pp*, *ppp*, *pp*
- Vib.:** *pp*, *ppp*, *pp*, *ppp*, *pp*, *ppp*, *pp*, *ppp*, *pp*, *ppp*, *pp*, *ppp*, *p*
- Pno.:** *ppp*, *p*, *ppp*, *p*, *ppp*, *p*, *pp*, *p*, *ppp*, *p*, *pp*, *ppp*, *p*

94

Cl.

Vla.

Vib.

Pno.

ppp pp mp ppp pp mp ppp pp mp ppp pp mp ppp pp mp

ppp pp ppp pp ppp pp ppp pp ppp pp ppp pp ppp

pp ppp p pp pp ppp p pp ppp p pp ppp p pp ppp p

ppp p pp pp ppp p pp ppp p pp ppp p pp ppp p ppp

99

Cl.

Vla.

Vib.

Pno.

ppp pp mp ppp pp mp ppp pp mp ppp pp mp ppp pp mp ppp

pp ppp pp ppp ppp pp ppp pp ppp pp ppp pp ppp pp ppp

pp ppp p pp pp ppp p pp ppp p pp ppp p pp ppp p

p pp ppp p pp ppp p pp ppp p pp ppp p pp ppp p ppp

104

Cl.

Vla.

Vib.

Pno.

pp mp ppp pp mp ppp mp ppp p mp ppp mp ppp p

pp p ppp pp p ppp pp p p ppp pp p p ppp

ppp p pp ppp p pp ppp p pp ppp p pp ppp p

p pp ppp p pp ppp pp ppp ppp ppp ppp ppp

109

Cl.

Vla.

Vib.

Pno.

mp ppp p mp ppp p mp ppp p mp ppp p mp ppp p

pp p ppp pp p ppp pp p p ppp p p ppp

p pp ppp p pp ppp p pp ppp p pp ppp p pp ppp

pp ppp pp ppp pp ppp p p ppp p p ppp p p

[illegible]

119

Cl.

Vla.

Vib.

Pno.

This musical score segment contains measures 119 through 123. It is written for four instruments: Clarinet (Cl.), Viola (Vla.), Vibraphone (Vib.), and Piano (Pno.). The key signature has one sharp (F#) and the time signature is 4/4. The Clarinet part features a melodic line with dynamic markings of *p* and *ppp*. The Viola part provides harmonic support with *ppp* and *mf* dynamics, including a key signature change to one flat (Bb) in measure 121. The Vibraphone and Piano parts play a rhythmic pattern of eighth and sixteenth notes, with dynamics ranging from *pp* to *ppp*.

124

Cl. *p ppp* *p ppp*

Vla. *mf ppp* *mf ppp* *mp ppp* *mf ppp* *mp ppp* *mf ppp* *mp p*

Vib. *ppp* *pp* *ppp* *pp* *ppp* *pp* *ppp* *pp* *ppp* *pp*

Pno. *p ppp* *p ppp* *p ppp* *p ppp* *p ppp* *p ppp* *mf*

129

Cl. *ppp* *mf ppp* *mp p* *ppp* *mf ppp* *mp p* *mf ppp*

Vla. *ppp* *mf ppp* *mp p* *ppp* *mf ppp* *mp p* *mf ppp*

Vib. *ppp* *pp* *ppp* *pp* *mf pp* *mf* *pp* *mf*

Pno. *p ppp* *mf* *p ppp* *mf ppp* *mf ppp* *mf ppp* *mf ppp*

133

Cl.

Vla.

Vib.

Pno.

ppp *mp* *p* *mf* *ppp* *mp* *p* *mf* *mp* *ppp* *mp* *p* *mf* *mp* *ppp* *mp* *p* *mf* *mp*

[illegible]

141

Cl. *ppp* *pp* *p* *ppp* *pp* *p* *ppp* *pp* *p*

Vla. *mp* *p* *mf* *mp* *ppp* *mp* *p* *mf* *mp* *ppp* *p* *mf* *mp* *ppp*

Vib. *pp* *mf* *ppp* *mp* *pp* *mf* *ppp* *mp* *p* *pp* *mf* *ppp* *mp* *p*

Pno. *ppp* *mf* *ppp* *p* *pp* *ppp* *mf* *ppp* *p* *pp* *mf* *ppp* *p* *pp* *mf* *ppp* *p* *pp*

145

Cl. *ppp* *pp* *p* *ppp* *pp* *p* *ppp* *pp* *p* *ppp*

Vla. *p* *mf* *mp* *ppp* *p* *mf* *mp* *ppp* *mf* *mp* *ppp* *mf* *mp* *ppp*

Vib. *pp* *mf* *ppp* *mp* *p* *mf* *ppp* *mp* *p* *mp* *ppp* *mp* *p* *mp* *ppp*

Pno. *ppp* *p* *pp* *mf* *ppp* *p* *pp* *mf* *ppp* *p* *pp* *mf* *ppp* *p* *pp* *mf* *pp* *mf* *pp*

149

Cl.

Vla.

Vib.

Pno.

pp *p* *ppp* *pp* *p* *ppp* *pp* *p* *ppp* *mp*

mp *ppp* *mp* *ppp* *mp* *ppp* *mp* *ppp* *mp* *ppp*

mp *p* *mp* *ppp* *mp* *p* *mp* *ppp* *mp* *p* *mp* *ppp*

ppp *p* *pp* *mf* *pp* *ppp* *p* *pp* *mf* *pp* *ppp* *p* *pp* *mf* *pp*

[illegible]

157

Cl.

Vla.

Vib.

Pno.

p ppp mp p ppp p ppp mp p ppp p ppp

ppp p ppp p ppp p ppp p ppp

p mp ppp p mp ppp p mp ppp p mp ppp

pp mf pp ppp mp pp mf pp ppp mp ppp pp mf pp mf pp

161

Cl.

Vla.

Vib.

Pno.

mp p ppp mp ppp mp ppp mp ppp

p ppp p ppp p ppp p ppp

mp ppp mp ppp ppp pp ppp pp

mf pp ppp mp ppp pp ppp mp ppp pp ppp mp ppp

165

Cl.

Vla.

Vib.

Pno.

165

166

167

168

169

170

Cl.

Vla.

Vib.

Pno.

170

171

172

173

174

Cartography #10, for marimba, vibraphone, and piano

Mapping and rules

pitches		looping mechanism	
set size	$N = 6$	window size	$16 \times \text{♪}$ (post-loop)
transformation period	$1/2 \times \text{bar}$ (pre-loop)	shift size	semiquaver
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) - 1$, and g at a uniformly randomly selected octave transposition. There is a 50% of chance of a new element being a rest, but two rests can never follow each other.	mechanism	the algorithm first creates a non-looped version of the music using the maps and transformation mechanisms to select pitches, durations and dynamics as described above. After this music is generated, the next stage is to use a 16 semiquavers-long window which is shifted to the right by a single semiquaver after every cycle. The processes ends when the last note of the pre-looped music leaves the looping window.
initial set	$[C6, B5, B\flat5, A5, A\flat5, G5]$		
dynamics		constraints	
set size	$N = 3$	<ul style="list-style-type: none"> number of bars (pre-loop): 10. range: F3–F6. accents and diminuendos are added to all initial notes with a dynamic level of <i>p</i> or <i>mp</i>. 	
transformation period	fixed		
set	$[pp, p, mp]$		
selection mechanism	the dynamics map is tied to the duration map, so that a same random index is used to select elements from both. For instance, if the duration at the second index has been selected, the dynamic <i>p</i> is then also selected.		
durations			
set size	$N = 3$		
transformation period	$2 \times \text{bars}$ (pre-loop)		
transformation mechanism	$[a, a - 1, a - 2] \rightarrow [a - 1, a - 2, a - 3]$, where an element equals to 1 if $a - k < 1$.		
initial set	$[10, 9, 8]$		

General performance notes

- this piece should be played fairly quietly. New notes with dynamics of *p* or *mp* always have a slightly louder attack than the ones around it. The diminuendo hairpins should be executed very smoothly, always reaching *pp* at the end.
- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer). The performer may flush it ad libitum. Measures with rests at the end may benefit from less pedalling, but abrupt cuts of pedalling are to be avoided.
- use plenty of pedal in the vibraphone throughout the piece, blending consecutive sounds. The performer may flush it ad libitum. Rests are to be respected by flushing all sounds.
- after the last note of the piece, both the vibraphone and the piano should let the resonance disappear before raising the sustain pedal.
- the vibraphone's motor should remain off throughout the piece.
- medium mallets are recommended for the vibraphone.
- medium mallets are recommended for the marimba.

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Cartography #10

Gilberto Agostinho

$\text{♩} = \text{ca. } 72$

Marimba

Vibraphone

Piano

pp
motor off

mp *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *pp*

ℳℳ. →

mp *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *pp*

$\frac{1}{2} \text{ ℳℳ.} \rightarrow$

5

Mar.

Vib.

Pno.

mp *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *pp*

p *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *pp*

mp *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *pp*

p *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *pp*

9

Mar.

Vib.

Pno.

p *pp* *p* *pp* *p* *pp* *p* *pp*

p *pp* *p* *pp* *p* *pp* *p* *pp*

p *pp* *p* *pp* *p* *pp* *p* *pp*

13

Mar.

Vib.

Pno.

p *pp* *p* *pp* *p* *pp* *p* *pp*

p *pp* *p* *pp* *p* *pp* *p* *pp*

p *pp* *p* *pp* *p* *pp* *p* *pp*

17

Mar.

Vib.

Pno.

p *pp* *p* *pp* *p* *pp* *p* *pp*

p *pp* *p* *pp* *p* *pp* *p* *pp*

p *pp* *p* *pp* *p* *pp* *p* *pp*

22

Mar. *p* *pp*

Vib. *p* *pp* *mp* *pp*

Pno. *p* *pp* *mp* *pp*

26

Mar. *p* *pp* *p* *pp*

Vib. *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp*

Pno. *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp*

30

Mar. *pp* *p* *pp* *p* *pp*

Vib. *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp*

Pno. *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp*

34

Mar.

Vib.

Pno.

mp *pp* *mp* *pp* *p*

pp *mp* *pp* *p*

p *pp*

p *pp*

p *pp*

p *pp*

38

Mar.

Vib.

Pno.

p *pp* *p* *pp*

pp *mp* *pp* *p* *pp*

pp *mp* *pp* *p* *pp*

p *pp*

p *pp*

p *pp*

p *pp*

42

Mar.

Vib.

Pno.

p *pp* *p* *pp*

mp *pp* *p* *pp*

mp *pp* *p* *pp*

p *pp*

p *pp*

p *pp*

p *pp*

46

Mar. *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp*

Vib. *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp*

Pno. *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp*

50

Mar. *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp*

Vib. *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp* *p* *pp*

Pno. *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp*

54

Mar. *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp*

Vib. *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp* *mp* *pp*

Pno. *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp* *p* *pp* *mp* *pp*

58

Mar. *p pp mp > pp* *p > pp* *mp > pp* *p > pp* *mp > pp* *p > pp*

Vib. *mp > pp* *mp > pp* *mp > pp* *mp > pp*

Pno. *p > pp* *mp > pp* *p > pp* *mp > pp* *p pp* *p pp* *mp > pp* *p > pp*

62

Mar. *mp > pp* *p > pp* *mp pp* *p > pp* *p > pp* *p* *p > pp* *p pp*

Vib. *mp > pp* *mp > pp* *mp > pp* *mp > pp*

Pno. *mp > pp* *p > pp* *mp > pp* *p > pp* *mp > pp* *p > pp* *mp > pp* *p > pp*

66

Mar. *p > pp* *p > pp* *p > pp* *p > pp* *p > pp* *p > pp* *p > pp* *p > pp*

Vib. *mp > pp* *mp > pp* *mp > pp* *mp pp*

Pno. *mp pp* *p > pp* *p > pp* *p > pp* *p > pp* *p > pp* *p > pp* *mp*

70

Mar. *p* > *pp* *p* > *pp* *p* > *pp* *p* > *pp* *p* *pp* *p* > *pp* *p* > *pp*

Vib.

Pno. *p* > *pp* *mp* > *pp* *p* > *pp* *mp* > *pp* *p* > *pp* *mp* > *pp* *p* > *pp* *mp* > *pp*

74

Mar. *p* > *pp* *p* > *pp* *p* > *pp* *p* > *pp*

Vib.

Pno. *p* > *pp* *mp* > *pp* *p* > *pp* *mp* > *pp* *p* > *pp* *mp* > *pp* *p* *pp* *mp* > *pp* *p*

78

Mar. *p* > *pp* *p* > *pp* *p* > *pp* *p* > *pp*

Vib.

Pno. *pp* *mp* > *pp* *p* *pp* *mp* > *pp* *p* > *pp* *mp* > *pp* *p* > *pp* *mp* > *pp* *p* > *pp* *p*

Musical score for measures 86-89. The score is written for three staves: Mar. (Maracas), Vib. (Vibraphone), and Pno. (Piano). The key signature has one flat (B-flat) and the time signature is 4/4.

- Measure 86:** Mar. plays eighth notes G4, A4, Bb4, C5, D5, E5, F#5, G5. Vib. plays quarter notes G4, A4, Bb4, C5. Pno. plays quarter notes G4, A4, Bb4, C5.
- Measure 87:** Mar. plays eighth notes G4, A4, Bb4, C5, D5, E5, F#5, G5. Vib. plays quarter notes G4, A4, Bb4, C5. Pno. plays quarter notes G4, A4, Bb4, C5.
- Measure 88:** Mar. plays eighth notes G4, A4, Bb4, C5, D5, E5, F#5, G5. Vib. plays quarter notes G4, A4, Bb4, C5. Pno. plays quarter notes G4, A4, Bb4, C5.
- Measure 89:** Mar. plays eighth notes G4, A4, Bb4, C5, D5, E5, F#5, G5. Vib. plays quarter notes G4, A4, Bb4, C5. Pno. plays quarter notes G4, A4, Bb4, C5.

Dynamics markings include *p*, *pp*, and accents (*>*) throughout the passage.

93

Mar.

p *pp*

Vib.

p *pp*

Pno.

p *pp* *p* *pp*

p *pp* *p* *pp*

p *pp*

p *pp*

[illegible]

99

Mar. *pp* *p* *pp* *p* *pp*

Vib. *pp* *p* *pp* *p* *pp*

Pno. *pp* *p* *pp* *p* *pp*

102

Mar.

Vib.

Pno.

p *pp*

p *pp*

p *pp*

105

Mar.

Vib.

Pno.

p *pp*

p *pp*

p *pp*

108

Mar.

Vib.

Pno.

p *pp*

p *pp*

p *pp*

111

Mar.

Vib.

Pno.

114

Mar.

Vib.

Pno.

117

Mar.

Vib.

Pno.

120

Mar.

Vib.

Pno.

123

Mar.

Vib.

Pno.

126

Mar.

Vib.

Pno.

129

Mar.

Vib.

Pno.

132

Mar.

Vib.

Pno.

135

Mar.

Vib.

Pno.

138

Mar.

Vib.

Pno.

141

Mar.

Vib.

Pno.

145

Mar.

Vib.

Pno.

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Cartography #11, for solo piano

Mapping and rules

pitches		looping mechanism	
set size	$N = 6$	window size	$16 \times \text{♪}$ (post-loop)
transformation period	$1 \times \text{bar}$ (pre-loop)	shift size	semiquaver
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) + 1$, and g at a uniformly randomly selected octave transposition within the instrument range defined as a constraint.	mechanism	the algorithm first creates a non-looped version of the music using the maps and transformation mechanisms to select pitches, durations and dynamics as described above. After this music is generated, the next stage is to use a 16 semiquavers-long window which is shifted to the right by a single semiquaver after every cycle. The process ends when the last note of the pre-looped music leaves the looping window.
initial set	$[C4, C\sharp4, D4, E\flat4, E4, F4]$		
durations		constraints	
set size	$N = 5$		
transformation period	$2 \times \text{bars}$ (pre-loop)		
transformation mechanism	$[a, b, c, d, e] \rightarrow [b, c, d, e, f]$, with $f = e - 1$.		
initial set	$[12, 11, 10, 9, 8]$		
articulations			
possibilities	$\{\emptyset, >, \wedge\}$, where \emptyset represents no articulation.		
selection mechanism	the composition is made out of three voices, one for each type of articulation. These are then superimposed to create the final work.		
			<ul style="list-style-type: none"> • number of bars (pre-loop): 8. • range: C3–C7. • dynamic: <i>pp</i>

General performance notes

- the piano's sustain pedal should be held halfway down throughout the piece. A good reference point for this is when individual note lengths cannot be precisely perceived (that is, the sound is not cut when releasing a key). Some instruments and acoustic spaces might call for slightly different pedalling (at the discretion of the performer).
- after the last note of the piece, let the resonance disappear before raising the sustain pedal.
- this piece has a single dynamic mark of ***pp***. Variations in loudness are notated using solely marcato and martellato signs (> and ^ , respectively). Notes without articulations marks should be played as softly as possible (equivalent to ***pp***), notes with a marcato sign should have a slightly louder level of loudness (equivalent to ***mp***) and notes with a martellato sign should have a higher level of loudness (equivalent to ***f***).

Cartography #11

Gilberto Agostinho

♩ = ca. 66

Piano

$\frac{1}{2}$ *Ad.* → *pp*

6

10

14

19

23

28

32

36

40

44

48

52

56

This musical score consists of six staves of music, each containing measures 32 through 56. The notation is written on a single treble clef staff. The key signature has one flat (B-flat). The time signature is 4/4. The music is characterized by a complex, rhythmic pattern of eighth and sixteenth notes, often beamed together. There are frequent rests and ties, suggesting a fast, intricate melody. The notation includes various accidentals (sharps, flats, naturals) and dynamic markings (accents, slurs). The overall style is that of a classical or romantic-era instrumental piece, possibly a piano or violin solo.

60

64

68

72

76

80

This musical score consists of six staves of music, numbered 60 through 80. The notation is in treble clef and features a complex, rhythmic melody. The key signature is one flat (B-flat). The music is characterized by frequent use of eighth and sixteenth notes, often beamed together in groups. There are several instances of triplets and syncopation. The dynamics range from piano (p) to forte (f). The piece concludes with a final cadence in measure 80.



Cartography #12, for flute, clarinet, violin, viola, and violoncello

Mapping and rules

pitches		looping mechanism	
set size	$N = 6$	window size	$16 \times \text{♪}$ (post-loop)
transformation period	$1 \times \text{bar}$ (pre-loop)	shift container	[print position, ignore position]
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g \bmod 12 = (f \bmod 12) - 1$, and g at a uniformly randomly selected octave transposition.	mechanism	the algorithm first creates a non-looped version of the music using the maps and transformation mechanisms previously described. Next, it applies a 16 semiquavers-long window which is shifted to the right by a semiquaver. The algorithm then decides whether to print or ignore the current window using the container above, and then continues shifting by a semiquaver. Effectively, this creates window shifts of arbitrary sizes. The process ends at the first bar in which all instruments have a rest at the 16th position of a window.
initial set	[F4, E4, Eb4, D4, C#4, C4]		
durations		constraints	
set size	$N = 5$		
transformation period	$4 \times \text{bars}$ (pre-loop)		
transformation mechanism	$[a, b, c, d, e] \rightarrow [b, c, d, e, f]$, with $f = e - 1$.		
initial set	[12, 11, 10, 9, 8]		
appoggiaturas			
set size	$N = 6$		
transformation period	$4 \times \text{bars}$ (pre-loop)		
transformation mechanism	$[a, b, c, d, e, f] \rightarrow [b, c, d, e, f, g]$, with $g = \text{'no'}$.		
initial set	[yes, no, yes, no, yes, yes]		
notation	appoggiaturas are always a semitone higher than the note they apply to and last for a semiquaver. They are always slurred.		
			<ul style="list-style-type: none"> number of bars (pre-loop): 20. ranges: flute C4–F#6, clarinet D3–F#6, violin G3–F#6, viola C3–C6, violoncello C4–F5. dynamics: constantly <i>pp</i>. harmonic range: violin Bb5 and above, viola F5 and above, violoncello full range. the flute, clarinet, and cello alternate between rests and pitched notes for every selected duration.

General performance notes

- the dynamic level should remain at *pp* throughout the entire piece.
- all performers should play without vibrato.

to Ensemble Terrible
Cartography #12

Gilberto Agostinho

Score in C

$\text{♩} = \text{ca. } 72$

The musical score is for 'Cartography #12' by Gilberto Agostinho, in C major and 4/4 time. The tempo is marked as $\text{♩} = \text{ca. } 72$. The score is divided into two systems. The first system includes parts for Flute, Clarinet in Bb, Violin, Viola, and Violoncello, all marked *pp* (pianissimo). The second system includes parts for Fl., Cl., Vln., Vla., and Vcl. The Flute and Clarinet in Bb parts feature a melodic line with eighth and sixteenth notes, while the Violin, Viola, and Violoncello parts provide a harmonic accompaniment. The Fl., Cl., Vln., Vla., and Vcl. parts continue the melodic and harmonic development in the second system.

12

Fl.

Cl.

Vln.

Vla.

Vcl.

17

Fl.

Cl.

Vln.

Vla.

Vcl.

22

Fl.

Cl.

Vln.

Vla.

Vcl.

27

Fl.

Cl.

Vln.

Vla.

Vcl.

32

Fl.

Cl.

Vln.

Vla.

Vcl.

37

Fl.

Cl.

Vln.

Vla.

Vcl.

42

Fl.

Cl.

Vln.

Vla.

Vcl.

47

Fl.

Cl.

Vln.

Vla.

Vcl.

52

Fl.

Cl.

Vln.

Vla.

Vcl.

Measures 52-56: The Flute (Fl.) part features a melodic line with eighth and quarter notes, often tied across measures. The Clarinet (Cl.) part provides a rhythmic accompaniment with eighth and quarter notes. The Violin (Vln.) and Viola (Vla.) parts play a sustained harmonic texture with eighth and quarter notes. The Violoncello (Vcl.) part has a bass line with sustained notes and some movement.

57

Fl.

Cl.

Vln.

Vla.

Vcl.

Measures 57-61: The Flute (Fl.) part continues its melodic line. The Clarinet (Cl.) part has a more active role with eighth and quarter notes. The Violin (Vln.) and Viola (Vla.) parts continue the harmonic texture. The Violoncello (Vcl.) part has a more active bass line with eighth and quarter notes.

62

Fl.

Cl.

Vln.

Vla.

Vcl.

67

Fl.

Cl.

Vln.

Vla.

Vcl.

72

Fl.

Cl.

Vln.

Vla.

Vcl.

76

Fl.

Cl.

Vln.

Vla.

Vcl.

80

Fl.

Cl.

Vln.

Vla.

Vcl.

84

Fl.

Cl.

Vln.

Vla.

Vcl.

88

Fl.

Cl.

Vln.

Vla.

Vcl.

92

Fl.

Cl.

Vln.

Vla.

Vcl.

96

Fl.

Cl.

Vln.

Vla.

Vcl.

100

Fl.

Cl.

Vln.

Vla.

Vcl.

104

Fl.

Cl.

Vln.

Vla.

Vcl.

108

Fl.

Cl.

Vln.

Vla.

Vcl.

113

Fl.

Cl.

Vln.

Vla.

Vcl.

118

Fl.

Cl.

Vln.

Vla.

Vcl.

123

Fl.

Cl.

Vln.

Vla.

Vcl.

127

Fl.

Cl.

Vln.

Vla.

Vcl.

131

Fl.

Cl.

Vln.

Vla.

Vcl.

136

Fl.

Cl.

Vln.

Vla.

Vcl.

141

Fl.

Cl.

Vln.

Vla.

Vcl.

146

Fl.

Cl.

Vln.

Vla.

Vcl.

150

Fl.

Cl.

Vln.

Vla.

Vcl.

155

Fl.

Cl.

Vln.

Vla.

Vcl.

160

Fl.

Cl.

Vln.

Vla.

Vcl.

165

Fl.

Cl.

Vln.

Vla.

Vcl.