

Perceptual Memories, Physicality and Collaboration

As Sources of Musical Material in My Pieces

Situación #3, Situación #2, and Between Transparency and the Invisible

by

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A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Music

Approved April 2023 by the
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ARIZONA STATE UNIVERSITY

May 2023

ABSTRACT

This dissertation is an account of the strategies that I employed in the composition of three of my recent pieces: *Situación #3*, for flute (bass flute), clarinet (bass clarinet), piano, percussion, violin, cello, and electronics; *Situación #2*, for amplified acoustic guitar and two performers; and *Between transparency and the invisible*, for orchestra and electronics.

The first chapter, devoted to *Situación #3* discusses the re-interpretation of memories and visual records with musical means. The second chapter focuses on *Situación #2* and the issues of physicality and collaboration that originated the piece. The third chapter addresses *Between transparency and the invisible* and how it was informed by my experience contemplating visual art.

A mamá, cuyo canto fue la primera música que escuché.

ACKNOWLEDGMENTS

I want to thank José Julio Díaz Infante for proposing the idea to get a scholarship and come study in the U.S., but especially for persisting with it against my own disbelief. From the bottom of my heart: ¡Muchas gracias, Jos!

I also want to thank the members of my committee Fernanda Navarro, Gabriel Bolaños and Garth Paine for their guidance and generosity. You have all inspired me and left an indelible print in my heart and ears.

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JAP: Explicame eso que uno no se pede explicar a uno mismo.

GEG: No analizar a sí mismo, y menos analizar su obra.

*Porque yo tengo cada día otra opinión y todas las opiniones quizás
en conjunto forman algo pero para qué. ¿Para qué?*

- Transcription of an interview made to Gego by the filmmaker José Antonio Pantin

INTRODUCTION

This dissertation addresses some strategies that I have implemented for the composition of three of my latest pieces. These strategies are personal approaches to composition that, despite making use of some techniques that I have learnt along my time at ASU, come mainly from my interpretation of some experiences. They are either based on the perceptual memories of these experiences or are the direct result of them.

The first chapter is about *Situación #3*, a piece for a small ensemble based on the memory of some moments I experienced during a road trip and on some pictures that I took from these moments. The second chapter is about *Situación #2*, a piece that is the result of my experimentations with a guitar and the interaction between another performer, the instrument and me. Finally, the third chapter is about *Between transparency and the invisible*, an orchestral piece that is inspired by the experience I had contemplating some works of art by the visual artist Gego in an exhibition in Mexico City.

CHAPTER 1 SITUACIÓN #3

Situación #3 ...sobre la línea del horizonte is a piece for flute (bass flute), clarinet (bass clarinet), piano, percussion, violin, cello, and electronics. The origin of the piece lays on a moment during a road-trip from San Diego, CA to Tempe, AZ. There are two main sources from which I drew inspiration: the aural memory of those minutes during the travel that got printed in my mind, and a series of pictures I took at that moment. The piece is the result of something between the re-interpretation of the aural memory and the translation of a visual record into sound.

The pictures (four different formal stages)

I will talk first about the pictures and the way I approached them, because they gave birth to the formal skeleton of the piece and were the primal seed for its conception. The first thing I did was to dispose the pictures horizontally on a canvas and superimpose a time grid on them because I had clear from the beginning that I wanted to use the pictures as a formal map for the piece. I see in this series of images at 4 different stages, each of them constituted by several pictures and each of them with at least one differentiating visual characteristic: in the first stage the pictures portray mainly the horizon dividing the earth from the sky (hence the piece's subtitle: *...sobre la línea del horizonte*), which has a gradient of colors from violet to blue. Along this stage, the slopes on the horizon have different degrees of steepness. During the second stage the horizon is practically flat, and

some bushes and other blurry objects start gradually appearing until the third stage, where the blurry objects start being more and more present, masking the horizon and making it disappear. On the fourth stage, the power lines become the main element in the pictures (see figure 1).

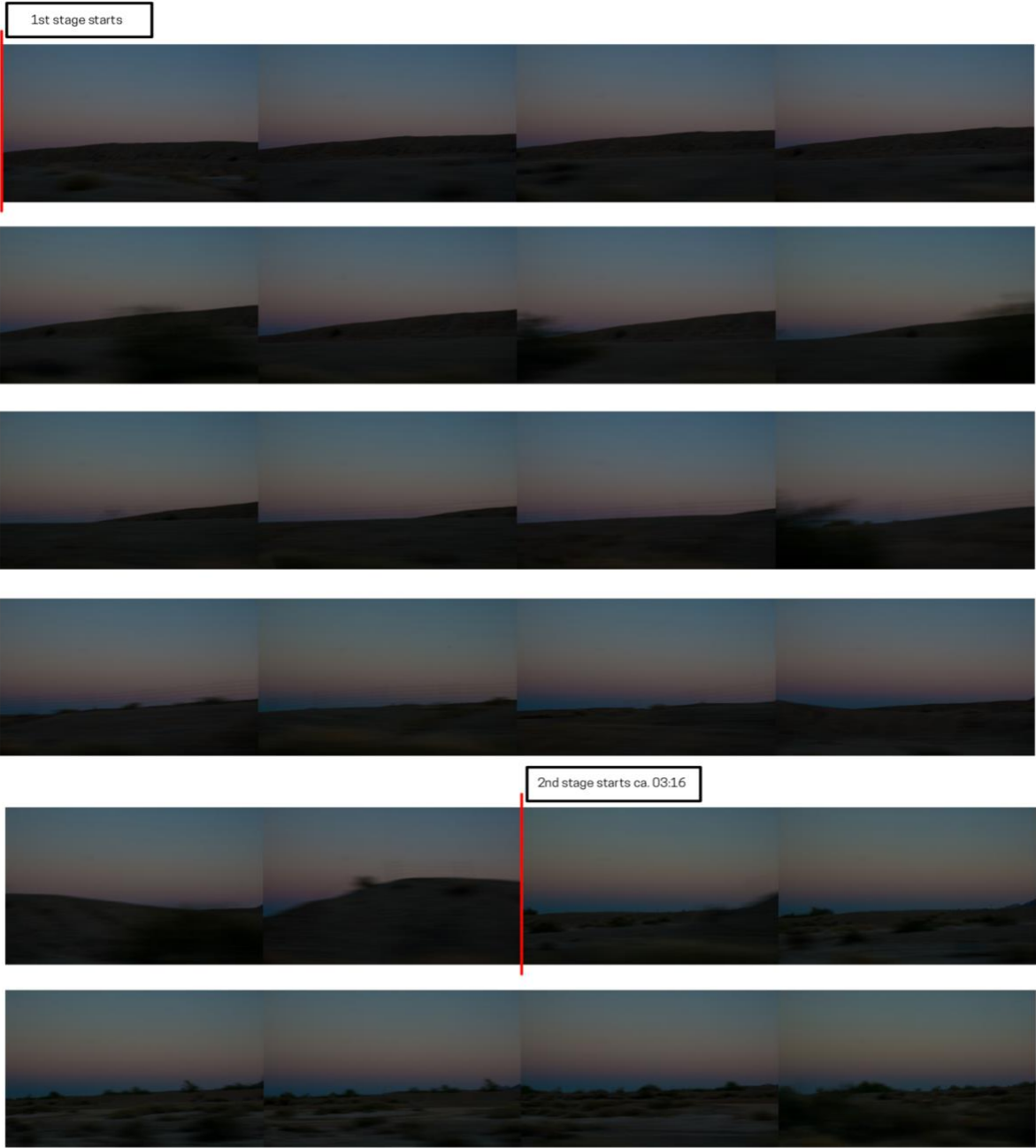




Figure 1. Pictures of a trip from San Diego to Tempe.

First stage

This stage goes from the beginning of the piece approximately up to minute 03:16. Both the aural memory and the pictures define the musical material for this section in almost equal proportion. The aural memory comes from the experience of having the eardrums bulged because of the air pressure, while listening to the sound of the car's engine, the wind and the tires on the road, as if they were filtered, progressively moving to

a state where the ears have popped, and this way of listening is gone. To convey this idea with sound, the electronics for this section consist of a sine-wave glissando between two chords (see figure 2). The departure chord is a compressed version of the arrival chord, a very dense cluster, which produces a lot of beatings to create a muddy/granular texture that will prevail throughout this section. The gliss towards a chord with a wider range supports the idea of the ears popping and the frequency space opening.



Figure 2. Departure and arrival chord.

The harmonic material for both chords come from the same spectrum (see figure 3) that will be used later in the piece. The arrival chord is formed with partials that correspond to the first 5 numbers of the Fibonacci series (1, 2, 3, 5, 8) and the departure chord keeps the same proportions with a compressed range and is transposed an octave up, so it fits the range between the violoncello's III and IV strings. The spectrum is based on C2 and it is

distorted by a coefficient of 0.65¹. Pitches for this spectrum are rounded to the nearest quarter tone.



Figure 3. Spectrum on a C2 fundamental distorted by a coefficient of 0.65.

For this stage I approached the pictures as a sort of map to modulate timbre on the strings. I traced the horizon line and then used that line as a graphic to represent bowing transitions between *molto sul ponticello* and *molto sul tasto*.

¹ An explanation on the concept of distortion of harmonic spectra can be found in the essay Guide to the basic concepts and techniques of spectral music (Fineberg, “Guide to the basic concepts,” 93.), where Fineberg, when talking about the equation for distorting the partials of a spectrum, explains that “an exponent is added to the equation for harmonic partials, producing the following equation: frequency = rank* fundamental raised to the x power; where ranking is an integer defining the partial number; the fundamental and the frequency are expressed in Hz, and x is a value greater than zero.”

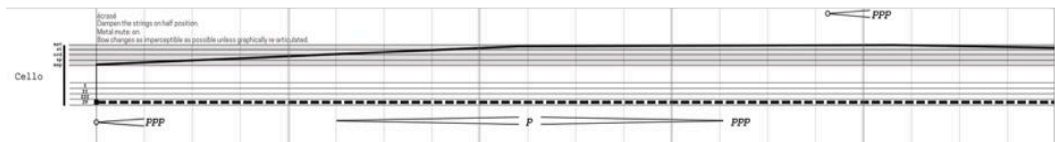


Figure 4. Example of the horizon line being mapped to the bowing graphic.

During this stage, strings are required to play with a metal mute to contribute to the muffled sound. They must dampen the strings with the left hand and heavily bow with the other hand to produce a scratch-like sound, with no presence of pitch that contributes to the overall timbre of the piece at this point: beatings and very dense sounds, closer to noise than they are to pitch. Strings follow the graphic of the horizon line, moving from *molto sul ponticello* to *molto sul tasto* and back, which creates subtle variations on the noisy sound, to represent movement. Cello and violin manipulate this material for the entire section, adding or subtracting density by alternating between III string, IV string, and both strings together, creating an inner movement within the texture. The bow pressure is another parameter that changes at some points to create this inner movement as shown in figure 5.

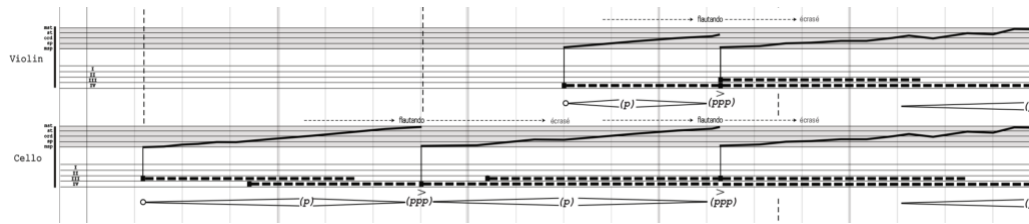


Figure 5. Changes in bow pressure.

The range of the departing chord on the electronics corresponds to the range of the III and IV strings on the cello (C3-G3), creating a conceptual and harmonic framing that will be expanded by the end of the section.

Piano and percussion have spared participations with material that is timbrally related to the muddy/granular texture: scratching the strings on the piano with a guitar pick or rubbing the drumheads with a superball (see figure 6).

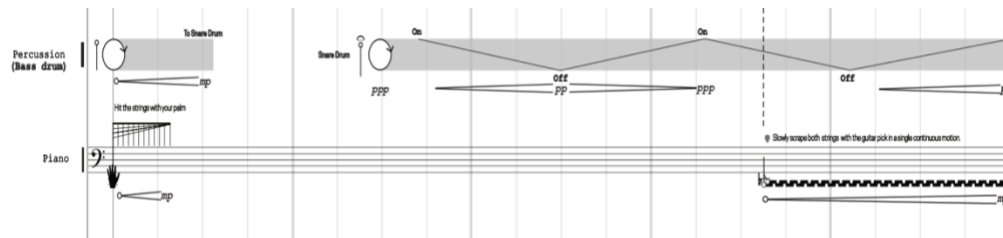


Figure 6. Piano and percussion timbrally complementing the strings' noisy texture.

From page 3 on, woodwinds start playing multiphonics as a way of representing with sound the image of power lines (more than a few lines running in parallel across the image) that start appearing at that point in the pictures (see figure 7).

Figure 7. Mutiphonics in woodwinds representing power lines.

This stage finishes on page 7 with a subtle crescendo on the density and dynamics on the acoustic instruments, while the sine-wave glissando is fading out (see figure 8).

Figure 8. End of stage 1.

There's an important change after the fermata, where stage 2 begins. The pitch content before this point was minimal. While the electronics were glissing between some

pitches, the range was so low and the pitches were so close together producing beatings, that this part's texture felt predominantly noisy. The woodwinds playing multiphonics contributed to this because of the unstable nature of multiphonics' spectra.

Second and third stages

Stage 2 starts around minute 3:16 and finishes around 5:15. Stage 3 finishes at 7:30. The relationship with the images at this point shifted the focus from the horizon line to the sky that is showing a gradient between different colors. The way these images were approached changed as well. While the previous compositional strategy was a mapping of the horizon line, on this stage the approach is less straightforward. The sky's most prominent colors in these pictures are blue, purple and yellow. Since purple and yellow are complementary colors and purple comes from the mix of blue with another color, there is a sense of coherence in this pallet, as if the different gradients of those colors, all had some sort of relationship between them. This perception led me to use a harmonic spectrum to represent the colors in the sky. However, these colors are mostly cold, and I perceive the pictures to have an aura of strangeness, so I decided to use a distorted spectrum (refer to figure 3).

There is a very simple harmonic discourse on the second and third stages. I took 10 partials from the spectrum that correspond to the first ten Fibonacci numbers omitting the "1" that works as a generator (1, 2, 3, 5, 8, 13, 21, 34, and 55) as if they were a single

chord. Along these two stages there are five iterations of this chord, every iteration going one partial higher than the previous one as is shown in figure 9.

The image shows a musical score with two staves, treble and bass clef. The score contains five iterations of a chord progression, each represented by a different colored box: red, green, blue, orange, and black. The boxes are arranged in a staggered, overlapping fashion, indicating a progression of pitches. Below the score, the following text labels the iterations:

First iteration
Second iteration
Third iteration
Fourth iteration
Fifth iteration

Figure 9. Harmonic material for the second and third stages

On every iteration the pitches were orchestrated in different ways for timbral variety, while keeping the sense of a very slow and subtle harmonic progression. This orchestration was of course limited by the instruments' range and their ability to produce microtonal pitches (see figure 10).

The image displays a musical score for eight instruments: Flute, Bass Flute, Clarinet in Bb, Bass Clarinet in Bb, Vibraphone, Piano, Violin, and Violoncello. The score is organized into five measures. The Flute part is mostly silent, with a single note in the fifth measure. The Bass Flute, Clarinet in Bb, and Bass Clarinet in Bb parts feature a sequence of notes across the measures, with some rests. The Vibraphone part has a series of notes, including some with grace notes. The Piano part consists of a few notes in the second, third, and fourth measures. The Violin and Violoncello parts play a similar sequence of notes, with the Violoncello part including some lower notes and rests.

Figure 10. Spectrum's orchestration on second and third stages. Instruments transposed.

These iterations do not happen in blocks. There is a weaving of the chords and a very simple process of durational subtraction that I will describe after briefly explaining how the temporal aspects are notated in the score. The piece is written with proportional notation, but there is a grid dividing every page. A metronomic mark of quarter = 40 bpm is written at the beginning and every page's duration is approximately thirty seconds with the grid dividing the page into twenty time units, so every time unit lasts for about 1.5 seconds (a quarter note when quarter = 40 bpm). Every pitch in every iteration lasts the same and is followed by the same amount of silence in the different instruments, but they do not start simultaneously, which creates the weaving of the chords (see figure 11).

The image displays a musical score for a multi-instrument ensemble. The instruments listed on the left are Bass Flute, Bass Clarinet, Violin, Cello, Percussion (Vibraphone), Piano, and Electronics. The score is written in a 2/4 time signature. It features a series of notes and rests across the staves, with dynamic markings such as *ppp*, *pp*, and *pp*. Performance instructions are included, such as "ordinary pressure", "flautando", "non vib", and "basso". A circled number "9" is located in the bottom right corner of the score area.

Figure 11 Example of the weaving of chords in page 9.

In the first and second iterations, the pitches last for twenty-four time units (around 36 seconds) and are followed by a silence of seven time units (around 10.5 seconds); in the third iteration, the pitches' duration remains the same but the silence gets reduced and now lasts for 5 time units (around 7.5 seconds); for the fourth iteration, the pitches' duration gets reduce to twenty time units (around 30 seconds) and the silence to four time units (around 6 seconds); finally for the fifth iteration the pitches' duration is of sixteen time units (around 24 seconds) and the silence's duration of three time units (around 4.5 seconds). After the fifth iteration the harmonic space narrows down and all the instruments play an F before going to the last section or fourth stage.

Instrumental techniques for the second and third stage

The idea of aurally representing the colors in the sky defined the techniques to be used during this section of the piece. When looking at the sky in the pictures, I imagined a long-sustained sound with gradual and subtle transitions and some sort of inner life. Some decisions were made with this in mind. The first of these was that a vibraphone would be used so the percussionist could harmonically participate in this texture. While the vibraphone can produce pitches, playing it with mallets would not produce the sustained sounds that the texture was asking for, so bowing the vibraphone's tone bars was requested. The other instrument that cannot produce sustained sounds when played conventionally is the piano. For this, a similar strategy was used. The piano is prepared attaching to the strings six threads made of nylon monofilament fishing lines that work as "bows." Each thread is attached to a string (or a set of strings) corresponding to the pitches indicated on figure 12.

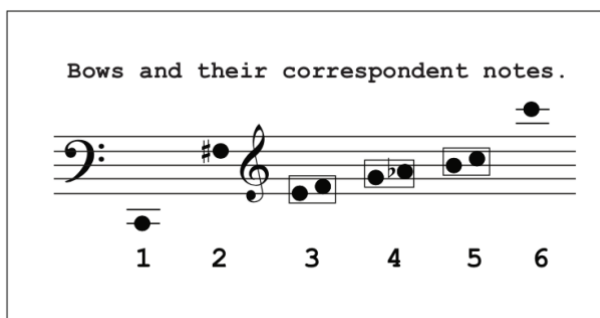


Figure 12. Piano's pitch chart for bow placement.

These strings are bowed while the sustain pedal is depressed, which produces long-sustained sounds. To reinforce the idea of the sound having inner life, there are some small timbral transformations within the instruments, along with dynamic transformations. The wind instruments are required to transition between their regular sound (a sound with clear pitch presence) and sounds with slightly less pitch presence, and finally sounds without any defined-pitch presence. These sounds are obtained by changing the angle in the embouchure. The transitions were notated with arrows and half-filled circles for the sounds with less pitch presence and empty circles for the sounds with no pitch presence, as can be seen in figure 13.

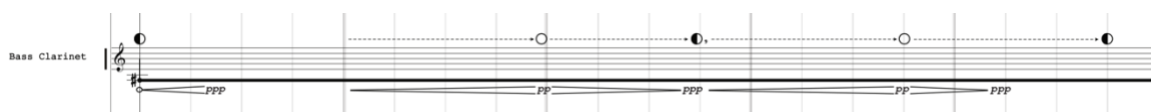


Figure 13. Timbral transformations on the woodwinds.

The strings' timbral transformations are made varying the amount of bow pressure and transitioning between different bowing areas (from *molto sul tasto* to *molto sul ponticello*), as can be seen in figure 14.

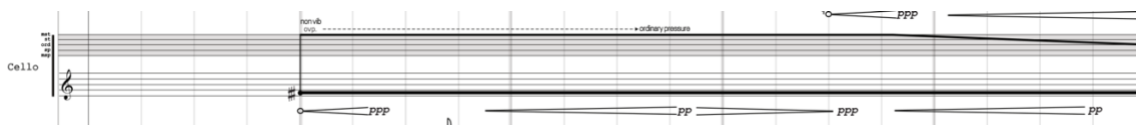


Figure 14. Timbral transformations on the strings.

Electronics in third stage

There are no electronics in stage two, and the re-appearance of the electronics marks the beginning of stage three. The difference between the pictures that belong to stage 3 and those of stage 2 is the appearance of objects that got blurred because of the relatively slow shutter speed with which the pictures were taken and the fast speed of the car I was taking the pictures from. These objects seemed to me like ghosts of the real objects that were in the highway.

The tools I chose to represent these objects were the electronics. For this part, the electronics consist of a texture created with recordings of the piano being bowed, producing pitches that belong to the spectrum that was used for the instrumental part. These recordings were granulated, reversed and processed with reverb and they form a texture that feels cohesive with the instrumental part because of the harmonic content and the subtle timbral resemblance, while having a ghostly quality thanks to the reverse and the pitch-shifted reverb.

The electronic texture was complemented by the instruments that gradually incorporate re-articulations of the sound while increasing and decreasing the dynamics, mimicking the sound of cars moving closer and further away (see figure 15).

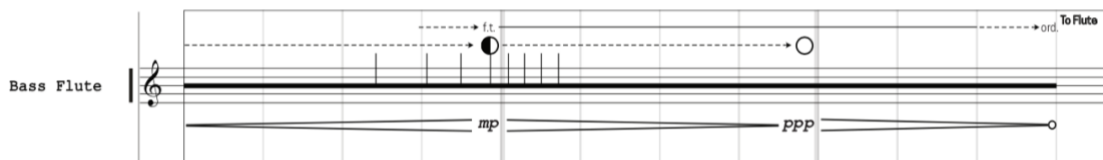


Figure 15. Bass flute performing re-articulations of the sound.

Fourth stage

Stage 4 starts around minute 7:30 and at this point the most prominent element in the pictures are some power lines that run along the field. By this point, the previous electronic texture has finished, and a very light filtered noise texture has been triggered. This texture represents the white noise produced by powerlines. Complementing this, there is a very subtle instrumental texture conformed by the cello and flute playing microtonal deviations around F while the violinist, clarinetist and percussionist are required to go to the piano and bow some strings belonging to the spectrum to build a cluster (E4, F4, G4, Ab4, B4, C5, and C6) until everything fades out.

Conclusions

While associations between sounds and visual phenomena have always been a part of my perception of sound, it is only recently that I have deliberately let mainly visual experiences foster musical ideas in my work. *Situación #3* is a particular case of this because the music material was drawn not only from the memory of the experience itself, but from the documentation of said experience. I wanted to musically interpret/recreate how I felt during those moments, and I used the visual record to formally structure the piece. The pictures were taken as a burst at a moderately slow shutter speed in the span of around 30 seconds. This is important to me because they are in a way a record of what I was seeing during that time, so using them as a formal map was a way to conceptually tie

the form to the event that generated the piece and helped achieving the continuous flow of the event with music. After composing this piece, I found that trying to re-construct an experience with musical means made me think harder on the dynamic (as constantly changing, not related to loudness) characteristics of sounds. Fidelity to the event at some point became less important than the ideas and sounds that this strategy had to offer.

CHAPTER 2 SITUACIÓN #2

Situación #2 is a piece for amplified acoustic guitar and two performers that I wrote as a commission for the 2022 PRISMS New Music Festival. The festival commissioned me to write a piece for solo guitar, but the performer was not provided. After being notified of the commission's guidelines, I thought of inviting my colleague Alicia Castillo to collaborate with me as a performer for the piece. Alicia, besides being a very interesting composer, is a talented guitarist, so the decision seemed just right.

Guitar was the first instrument I played and composed on. The context, however, was far from the conventions of the so-called "classical music." It was a context where experimentation was privileged over "proper technique" as understood in the context of so-called western classical music. This made me want to get involved in the performance of the piece, to renew my relationship with the instrument (now on a notation-based practice). Considering these things (my desire to collaborate with Alicia, my desire to be a performer for this piece, and the aesthetic context of my relationship with the instrument) I decided to write a piece for guitar that would avoid the compositional tropes in the "classical guitar" literature. Writing a piece for a guitar played by two performers made sense under that premise and helped me checking all the boxes on my expectations for the piece.

The material (the perks of directly experimenting with an instrument)

The process for creating the music material for this piece was very different from any other of my previous pieces. What was in other pieces an act of imagination or a remembrance of previously seen/learned techniques, became in this piece an act of direct experimentation with the instrument. First, I had to define the tools I would be working with. Given my background, the first thing that comes to my mind when I think about “unconventional” ways of playing guitar, is Radiohead’s Jonny Greenwood bowing a guitar with a cello bow (see figure 16).



Figure 16. Michell Zappa, Jonny Greenwood at the Heineken Music Hall, 2006, digital image, 2816x1684, https://commons.wikimedia.org/wiki/File:Jonny_Greenwood_in_Amsterdam.jpg

The continuous sound of his long drones is one of the things I associate guitar with, and that continuity was something I wanted to explore. However, in a search for a more flexible tool that would render the same results, I ended up using a thread of nylon

monofilament fishing lines, which I then rosined to use as a bow. It was a natural decision for me to also use guitar picks, slides, and of course the hands (see figure 17).



Figure 17. Fishing line, rosin, slides, and guitar picks.

After this, a process of experimentation took place, where I recorded long sessions of improvisation that produced some of the material/techniques used in the piece. Other techniques were a product of some explorations I wanted to do, which I will talk about next.

1. Relationship body-instrument

One of the first things I wanted to explore was the relation between the performers' bodies and the instrument and how that could affect the sound. For both of us to be able to perform on the same guitar, it was necessary to lay the instrument horizontally on a table and perform on it as if it was a keyboard instrument or a patient being surgically

intervened. This apparently simple decision changed completely the way we approached the instrument.

Pick+slide technique

One of the techniques required strumming and arpeggiating on the set of high strings with a guitar pick while the other hand moved along the fingerboard with a guitar slide (pick+slide technique from now on). This posed a problem because, since there were two people playing the same instrument, the performer in charge of executing this technique could not make it without blocking the other set of strings or choosing between two inconveniences: using the pick with the non-dominant hand (considering both of us have the right hand as the dominant hand), which was the less convenient idea since there are a lot of fast gestures in the piece, or having to cross hands, which was the final choice (see figure 18).

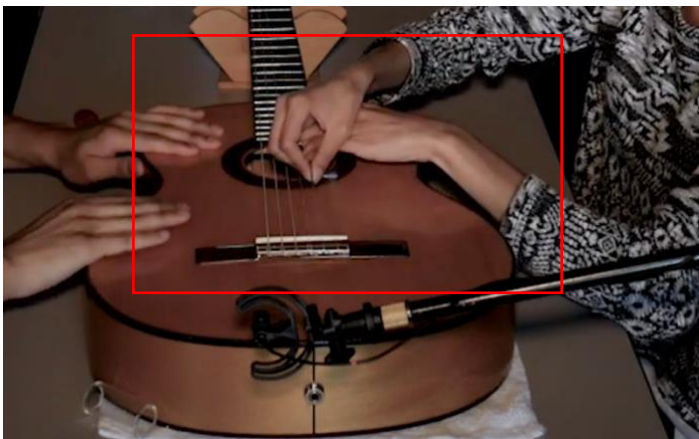


Figure 18. Crossing hands on pick and slide technique.

This way of executing this technique leaves the performer without a supporting point where to rest the hand and affects the fluidity of the gestures and the sound, giving that technique a stumbling, interrupted quality that I found very interesting and kept.

Sticky fingers

In opposition to the traditional technique, where the performer is practically hugging the guitar, laying the instrument horizontally on a table creates an immediate distance between the performers' bodies and the instrument (hence the metaphor of a patient being surgically intervened). Here the guitar is a body separated from the performers' bodies, versus the traditional technique where the performer's body and the guitar's body seem too fuse into a single entity. Attempting to bridge the gap between the performers' bodies and the instrument, I wanted to use a technique that had no intermediaries between the wooden body of the instrument and the performers' bodies, i.e., no use of strings, bow, slides, etc. The idea was that the characteristics (natural, enhanced, or modified) of the bodies were determinant for the sound production on the instrument.

I found the techniques that best fitted this idea as an accident after applying rosin to the fishing line threads. Rosin enhanced the stickiness that my skin's natural oils give to my palms and the act of placing the palm on the instrument's wood and then removing it quickly, produced a sound that I found very interesting, close to the sound of Velcro (see figure 19) when it is being teared apart.

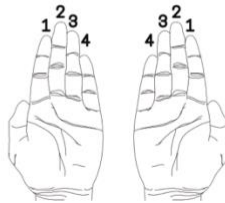



Figure 19. Velcro being torn apart.


The techniques derived from this are used in the first part of the piece and include a variation where one, two, or three fingers tap the wood in a cascade-like motion (see figure 20).

Sticky Fingers P1, P2

This technique must be played with your palms and fingers **fully** covered with rosin. This will make them very sticky and will produce a characteristic sound every time you take them off the top soundboard. There are 4 different types of symbols used in this section, each one represents a different technique. For this purpose, fingers will be numbered as follows:




 This is the most recurrent technique. It requires you to lay your hand on the soundboard, palm facing the guitar, and then abruptly taking your fingers off to get a sound as if you were tearing apart two pieces of velcro. It must be a brief fast movement, and you must leave a part of your palm in contact with the instrument.


 These symbols represent variations on the same technique. You should tap your fingers lightly against the soundboard in a single cascade-like movement, as fast as you can while also leaving a part of your palm in contact with the instrument.



 Tap only with your middle finger.

Figure 20. Instructions on the score for Sticky Fingers techniques.

Eventually Bartók *pizzicati* are added to the texture. The fact that these techniques use almost all the fingers producing very fast streams of short sounds allowed me to create dense granular textures (see figure 21).

The image shows a musical score for guitar, page 5. At the top, there is a tempo marking 'c. 30'' and a guitar icon. The score consists of a main staff with a treble clef and a lower staff with a bass clef. The main staff contains a series of notes with dynamic markings: *sfz-ff*, *sfz-ff*, *sfz-ff*, *sfz-ff*, *sfz-ff*, and *sfz-ff*. Above the main staff, there are several curved lines representing slides or bends. To the left of the main staff, there is a diagram of a guitar neck with a pick and a finger. To the right of the main staff, there is a diagram of a hand with a pick and a finger. The lower staff shows a dense pattern of notes, likely representing the granular texture mentioned in the text. A note 'P2: To one slide per hand.' is written on the right side of the lower staff. A small circled '5' is at the bottom right of the score.

Figure 21. Page 5, granular texture formed with sticky fingers, Bartók pizzicati, and pick+slide techniques.

2.- Interaction performer-performer: a collaborative effort

Given the fact that this is a piece for two performers playing one single instrument, the interaction between both performers was bound to pose very interesting contradictions that would need to be solved in the music. With the previously mentioned dilemma with the picking technique as an example, to me this piece requires a deep awareness of each other's bodies and because of this it is, among other things, a piece about collaboration.

Choreographed-like motions

A key moment that reveals this collaborative nature can be found on page 7, where a gesture that demanded a choreographed physical motion provokes one of the peak moments in the piece (see figure 22).

Situación #2
for amplified acoustic guitar
& two performers
2021

PL, P2: Repeat this gesture progressively speeding it up, until you feel it can't go any further.

c. 20"

PL, P2: Now you will both be moving the slide along all of the strings in a choreographed-like motion. Take a moment to understand the movement and then try to be as fluent as possible. Be in synchronicity with each other's movements.

Figure 22. Page 7, choreographed movement between both performers as notated in the score.

The score (whose notation transits between a descriptive and a prescriptive approach) asks both performers to hold one guitar slide in every hand and execute a technique where they place the slide parallel to the finger board and glide it along the strings (see figure 23).

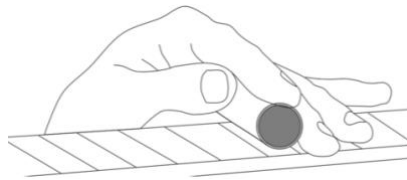


Figure 23. Slide placement.

Performer 2 is supposed to start the gesture by gliding their left-hand slide along half of the strings' length encompassing all six strings, starting on the guitar's nut. When reaching half of the strings' length they are supposed to continue the travel with their right-hand slide until they reach the end of the strings, right on the guitar's bridge. Right when this second movement is starting, performer 1 must start the same gesture in a sort of imitation with opposite hands, i.e., start with right hand, reach the middle of the strings, change to left hand, reach the guitar's bridge. Cutting the travel in the middle, changing hands, and starting the gesture at different times, allow both performers to never use the same portion of the strings simultaneously and avoid interrupting each other (see figure 24)². This gesture is repeated slowly twice and then the performers are required to gradually increase the speed until the gesture's speed becomes unsustainable.

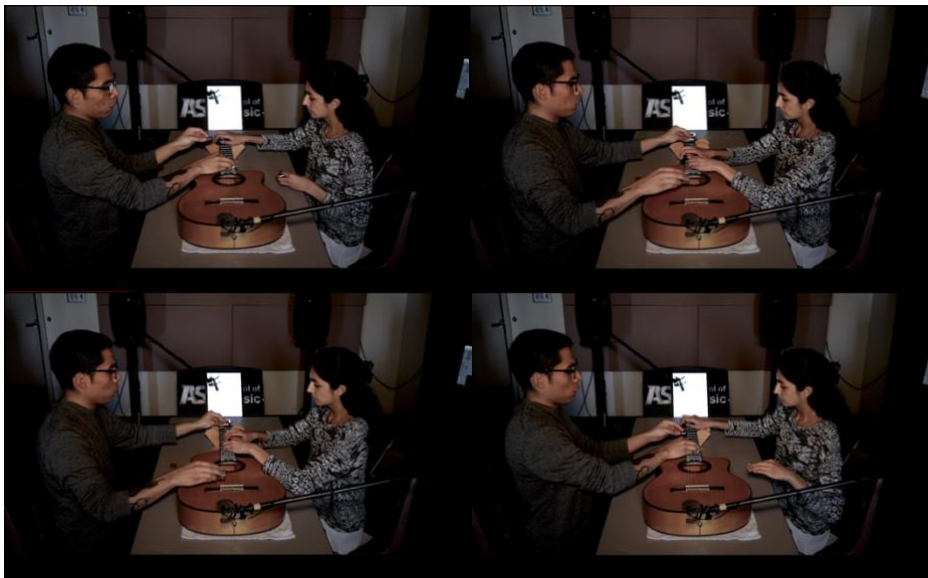


Figure 24. Stills of choreographed movement from the performance's video.

² For a better understanding of this, please see this video

<https://www.youtube.com/watch?v=QMPaa-ezfDo> on min 3:45.

Negotiation

The highest point of this collaboration comes in the last part of the piece, where both performers execute a technique together using the same tool. Each one of the performers must hold a tip of a very long thread made of nylon fishline and take turns to pull it towards their side to bow the strings. The notation in this part of the score is minimal even though this is to me the most important part of the piece. Dotted diagonal lines indicate the travel of the thread from the side of performer 1 (represented on the top of the score), to the side of performer 2 (represented on the bottom of the score). This is complemented by a dynamic mark which indicates that there must be a slow *decrescendo* to *ppp* and a brief indication for performers that reads: “get into the sound, look for interesting things, take as much time as you feel it’s necessary. Stop when you feel that the sound has depleted” (see figure 25).

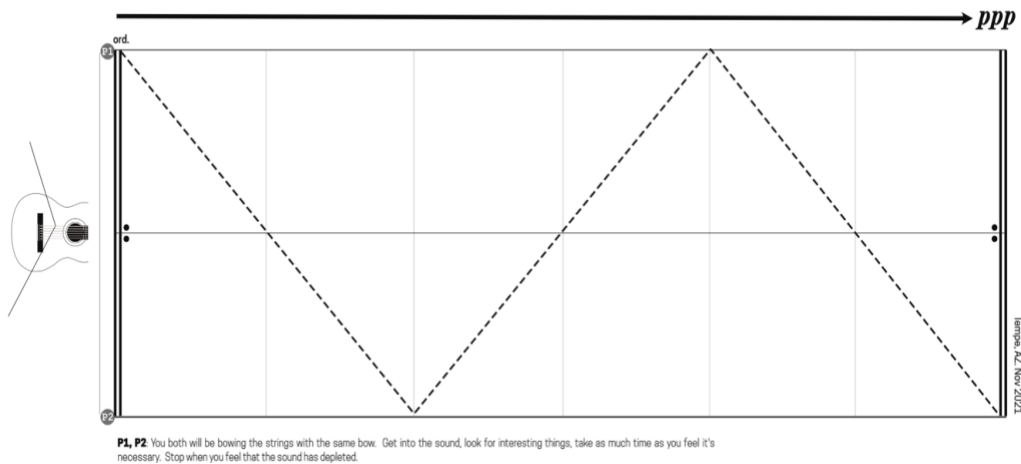


Figure 25. Notation for the final part of the piece.

When experimenting with this technique (which was first born as a technique for one performer with a much shorter thread), I realized that the most interesting sounds were the product of some sort of unspoken negotiation between Alicia and me. The moment I posed a resistance to her movements, a tension started building up. Eventually she started resisting my pulling too and finally we got into this dynamic where we let the sound inform our decisions for when to resist and when to give in. A negotiation was established between Alicia, the sound and me.

3.-Notation

Traditional western notation would have not sufficed to represent the type of material and ideas this piece works with. The choice was to create a notation that represented the actions performed rather than the sounds obtained. The basic idea was to create a space that represented the instrument's body along time (the horizontal axis). This way the actions were notated with different type of lines and symbols within that space (see figure 26 for an example).

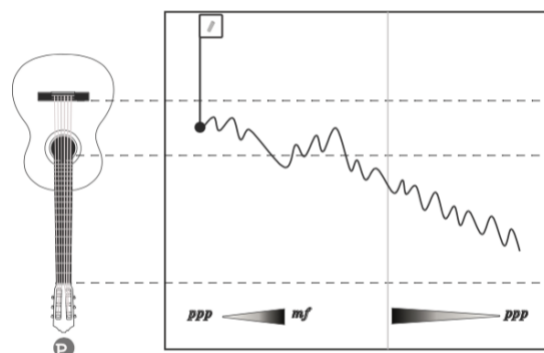


Figure 26. Example of the representation of the instrument's body in the score.

The notation adapts to the needs of the different techniques. And it sometime zooms in or out from the instrument, adding or subtracting information as it becomes necessary. In figure 27, we can see an example of the notation for the sticky finger + Bartók pizzicato technique, where three lines are added on top of the graph to represent the three strings where the performer would be performing the Bartók pizzicati.

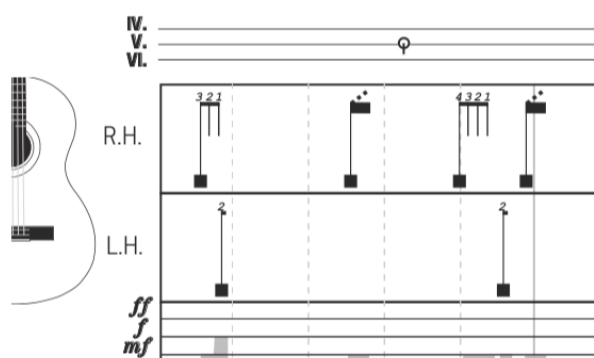
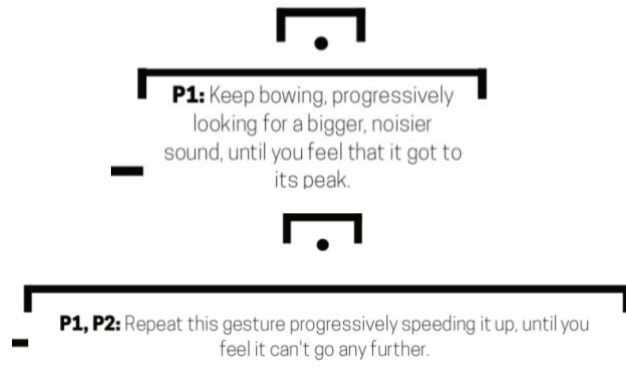


Figure 27. Notation for sticky fingers + Bartók pizzicato technique.

However, the most important thing for me was to be mindful of the performers' agency and to allow for instances of decision making in the piece's key moments. This was mainly achieved through verbal instructions (see figure 28). This was the solution I came up with to reinforce the collaborative nature I wanted this piece to have, and the most conceptually consequent decision I think I could have made.



P1, P2: You both will be bowing the strings with the same bow. Get into the sound, look for interesting things, take as much time as you feel it's necessary. Stop when you feel that the sound has depleted.

Figure 28. Examples of verbal instructions in the piece.

4.- Sound as matter (and some conclusions)

Sound is the underlying motivation for all the decisions taken throughout the piece. It is the consciousness of the inner life of sound what brings together these ideas and helped me approach and organize the sounds I discovered through experimentation. The sounds obtained with the sticky fingers techniques would not have been as interesting on their own as they were after reflecting on the possibilities that the sounds themselves and the physicality needed to produce them had to offer. As it was said before, the ease with which the fingers could create fast streams of sound tapping on the wood was determinant to create dense granular textures, but this would not have been possible without thinking about the sound as a matter with density that can be formed with lots of tinny grains³. The bowing

³ Refer to Wishart (Wishart, *On sonic art*, 68) for a definition of the concept of grain related to sound.

technique on its own would not have rendered the same interesting results without the consciousness that sound's spectral characteristics evolve in time and the subsequent exploration that led me to realize what happened when I bowed the strings closer to the bridge, when I put more or less tension on the thread, when I posed resistance to Alicia's pull, interrupting the continuum of sound, etc., and become intentional about it. This is a piece that helped me think about music composition and the role of sound in it in a broader way and changed the way I think about my materials and the sources they come from.

Informed by this way of thinking about sound, the piece's collaborative nature and the direct interaction with the instrument defined the materials, but they also gave me a multi-dimensional perspective on the creative act and opened possibilities for further exploration. At the end of the "pick + slide technique" section, I explained how the circumstances that forced Alicia to cross her hands leaving her without a supporting point to rest the hand affected the fluidity of the gestures. Why I did not attempt to mitigate this apparent "flaw" has two reasons: the first one is that I found the resulting sounds aesthetically pleasant, but the most important reason is that I found in this phenomenon a path to explore. One that leads me to places I would not get otherwise, and to me that is one of the greatest perks of experimentation.

CHAPTER 3 BETWEEN TRANSPARENCY AND THE INVISIBLE

After being commissioned to write a piece for ASU Symphony Orchestra, I started planning what the piece was going to be about. Something I learned about myself and large-scale pieces when writing a previous orchestral work, is that the formal thinking becomes way easier for me when I have a concept to anchor the piece on. The first attempts to come up with ideas were not very fruitful and I was not fully convinced about them, but I needed to start working, so I decided to stick with one of those ideas and start sketching some materials. Figure 29 shows the first attempt of a formal map for the piece.

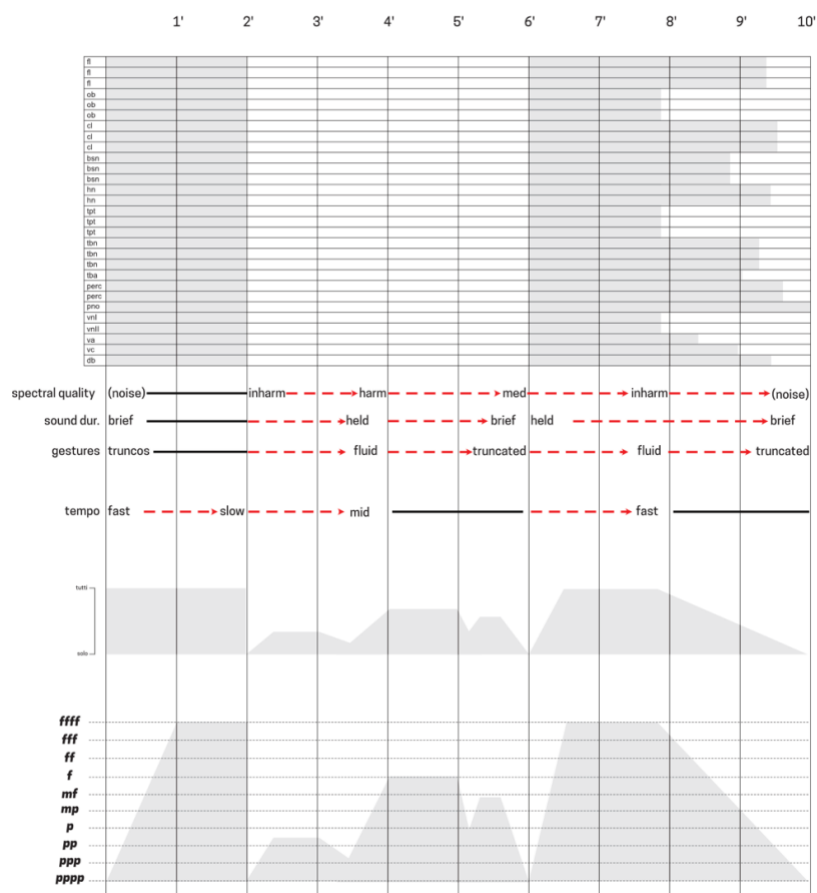


Figure 29. First attempt of a formal map for the orchestral piece.

The first texture according to this map would be a texture built with short, truncated sounds. The texture would make use of the entire orchestra, its spectral content would be mainly noisy, the tempo fast and the dynamic range would go from *ppp* to *fff* along the first minute of it and then would stay at *fff* for the next minute. The sketches for the first texture came very close to that, I came up with a multi-layered texture with different subdivisions of the beat, a lot of short, truncated sounds and a descending layer in the woodwinds and strings that was almost like a veil. After analyzing that material, I found very interesting how that quality of “shortness” in the sounds and their “truncation” created this perforated texture where the spaces between the sounds would let some other layers briefly come to the surface. I was very happy with that first material, but the long form was still a problem and I got stuck for a while with it.

Gego's work as a guide for the form in this piece

It was only after a trip to Mexico City, where I had the opportunity to attend an exhibition at Jumex Art Museum, that the concept came to me. The exhibition was a retrospective on Gertrud Goldschmidt's (Gego) work, a German-Venezuelan artist that was part of the Venezuelan abstraction movement during the 60's and 70's. I was shocked by Gego's work and especially by one idea that is constant along her entire career. This is the idea of transparency. A lot of Gego's works are these complex structures where lines (often made of coated iron, stainless steel or aluminum wires) tied to each other with knots create grids, expanding into space. The perforated nature of these structures allows the viewer to

see through the different layers, provoking a very interesting phenomenon where the tridimensional nature of these structures gets flattened and becomes a plane.



Figure 30. Santana, Juan. Gego en su reticulárea. 1969. Photograph. Hoy es arte, <https://www.hoyesarte.com/evento/gego-o-cuando-la-linea-es-el-recorrido/attachment/gego-en-su-reticularea-1969-foto-cortesia-juan-santana/>.

My perception of Gego's work had an immediate correspondence with the material I had so far sketched for the orchestral piece, so I decided to dig in further and read about her work. Eventually, Gego's ideas became a guiding light for my formal conception of the piece.

I would like to talk about some ideas that I read on the essay “Between transparency and the invisible: Gego’s in-between dimension”⁴ so I can later explain how these ideas relate to the piece’s form and processes, but first I will talk about the constitution of the original texture.

The original texture

The texture this entire piece is based on can be conceived as a holophonic texture⁵, a term coined by the Greek composer Panayiotis Kokoras, who defines it as “the synthesis of simultaneous sound streams into a coherent whole with internal components and focal points.”

Figure 33 includes the first three measures of the original texture that already show all the layers this texture is built with. Layer 1 is marked with red color, and consists of a gesture that goes down the partials of a distorted spectrum with E2 as fundamental with a distortion of 0.75 (see figure 31).

⁴ Mari Carmen Ramírez, “Between Transparency and the Invisible: Gego’s In-Between Dimension” in *Gego: Between Transparency and the Invisible* (Houston, Tx: The Museum of Fine Arts, Houston, TX / Malba, Fundación Eduardo Constantini, 2006), 22-49.

⁵ Kokoras, “Towards a Holophonic,” 5.3.

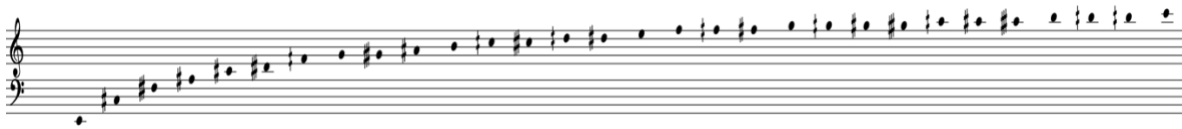


Figure 31. Spectrum of E2 with a distortion rate of 0.75.

Layer 2 is marked with color blue and consists of sharp attacks subdividing the beat in triplets. This layer uses the chromatic scale. Layer 3 is marked with green color, uses the same spectrum as layer 1, but with the fundamental an octave lower, and consists of swells on spectral chords. Layer 4 is marked with purple; it consists of swells on partials of a distorted spectrum with E2 as fundamental with a distortion rate of 0.85 (see figure 32) and subdivides the beat in quintuplets.



Figure 32. Spectrum of E2 with a distortion rate of 0.85.

Layer 5 is marked with orange and includes attacks on the percussion instruments that sometimes reinforce other layers and sometimes create more density. Finally, layer 6 is marked with black and has a very sharp material on the piano with a percussive effect and use of the chromatic scale.

Transparency

In Gego's written responses to nine questions posed by the filmmaker José Antonio Pantin, Gego explained: "I was interested in the transparency of volume so that a form could be appreciated fully from all angles of observation." Ramírez refers to this as a "productive tension by means of which the image and the ground of Gego's drawings and constructions challenge each other in an ambiguous perceptual realm that straddles flatness and three-dimensionality"⁶ and adds that "transparency refers us to the perceptual operations (seeing through the void) and physical elements (lines, grids) that make possible the complete apprehension of both her works on paper and wire constructions."⁷

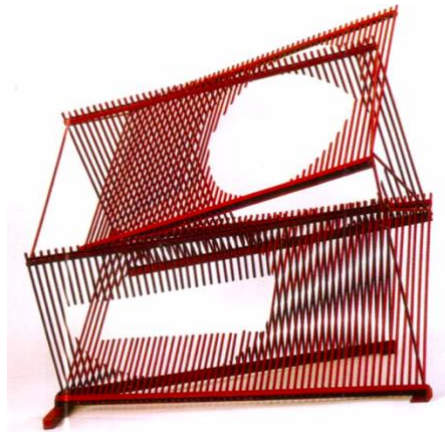


Figure 34. Gego, Cuatro planos rojos, 1967, in Mari Carmen Ramírez, "Between Transparency and the Invisible: Gego's In-Between Dimension" in Gego: Between Transparency and the Invisible (Houston, Tx: The Museum of Fine Arts, Houston, TX / Malba, Fundación Eduardo Constantini, 2006), 32.

⁶ Ramírez, "Between Transparency and the Invisible," 23.

⁷ *Ibid.*

The image displays a musical score for Figure 35, consisting of several systems of staves. The first system includes a staff with a 'slap tongue' instruction and a 'ff' dynamic marking. The second system features a 'plunger mute' instruction and a dynamic range from 'ff' to 'ppp'. The third system includes 'snd' and 'gong' markings, with a 'ppp' to 'ff' dynamic range. The fourth system has 'laco', 'mp', and 'ff' markings. The score uses various musical notations such as slurs, accents, and dynamic hairpins to indicate performance techniques and volume changes.

Figure 35. Between transparency and the invisible m. 2, trumpets, trombones, tuba, percussion and piano.

Figure 34 shows an example of transparency in Gego’s “Cuatro planos rojos”, where the voids between the lines allow the viewer to see the other planes, flattening the works three-dimensionality and squeezing the four planes into one. Figure 35 shows an excerpt of m. 2 in my piece, where the silences left by the different layers allow for other

layers to come through. Piano attacks on the second half of the third beat come through the void left by the other layers and so on.

I think of the first texture I sketched (mm. 1-8 in the score, appendix C) as one of Gego's structures, a structure that has transparency, whose layers allow to see through. The rest of the piece is based on recontextualizations and reinterpretations of this material. And on a process of dissolving opacity (which I will explain later). These first 7 measures were for me as standing in front of one of these structures for the first time, that first gaze in which the immediate perception is that of three-dimensionality. You are seeing a perforated structure, but it is still a three-dimensional one until you pay attention. The same thing happens with the piece. While there are multiple layers in this first texture, and you can get a grasp of them, they are still part of a complex sound artifact. It takes time (even the fraction of a second) and contemplation to activate what Ramírez calls the "in-between dimension" in Gego's work, and it takes time for the piece to develop and reach its goal. But before going forward I need to make a couple annotations.

Ramírez, based on Gego's work and on some statements made by her in short texts and interviews, interprets that Gego's final goal was to "make visible the invisible." This of course can be interpreted in many ways. Regarding this Ramírez says: "the aim of 'looking inside' or 'making visible the invisible' could only be attained through a form of abstraction capable of working *in* and *through* space. By leading the eye through the image, embodied by either the wire or line, and into the real and/or virtual space that holds the work, *transparency* opens up an *in-between dimension* that conveys the physical sensation

of something being hidden in space, that is the invisible”⁸ Later, Ramírez defines the “in-between dimension” as the “oscillation from the plane to real space.”⁹ So, as I see it, there is a process that goes: transparency->in-between dimension->making visible the invisible. This idea determined my formal development.

Form

My interpretation of this is that transparency (present in the initial texture of my piece) activates the in-between dimension and unveils “the invisible.” Since the in-between dimension is a phenomenon of perception where both things (the work’s three-dimensionality and its perceived existence in a single plane) exist simultaneously, I don’t intend to find a perceptual simile with my music, but to make a poetic interpretation of it. The strategy I used to represent this in-between dimension is the recontextualization of the texture’s layers because this would be a different way of listening to these layers, as the in-between dimension is a different way of seeing the planes. Along the piece the initial texture repeats several times slightly varied (as if we were taking a step back and looking at the entire structure again), and this is alternated with moments where separated layers of that texture are put in different contexts and end with a process of dissolving opacity that is represented with interpolations between a spectral cluster and two more “consonant”

⁸ *Ibid*, 23-24.

⁹ *Ibid*, 22.

chords. This last process comes from Ramírez' interpretation of Gego's intentions. According to Ramírez "In this system, transparency is supported by a clear, intuitive understanding about the nature of art in relation to the universe. The concern with dissolving opacity appears to be a key component of the artist's belief in the power of art to pierce the strata of the visible world to point out the veiled components of a bigger totality that is invisible to the eye." Dissolving opacity to unveil the veiled. As was said before, the harmony in layers 1, 3 and 4 comes from distorted spectra and throughout the piece the election of partials to form chords consistently looks for the dissonance, however some more "consonant" chords (the invisible) are hidden within the partials of that spectra and this last process intends to "unveil" them, which is the reason I chose to use an interpolation technique. Figure 36 shows a non-exhaustive map of the form of the piece.

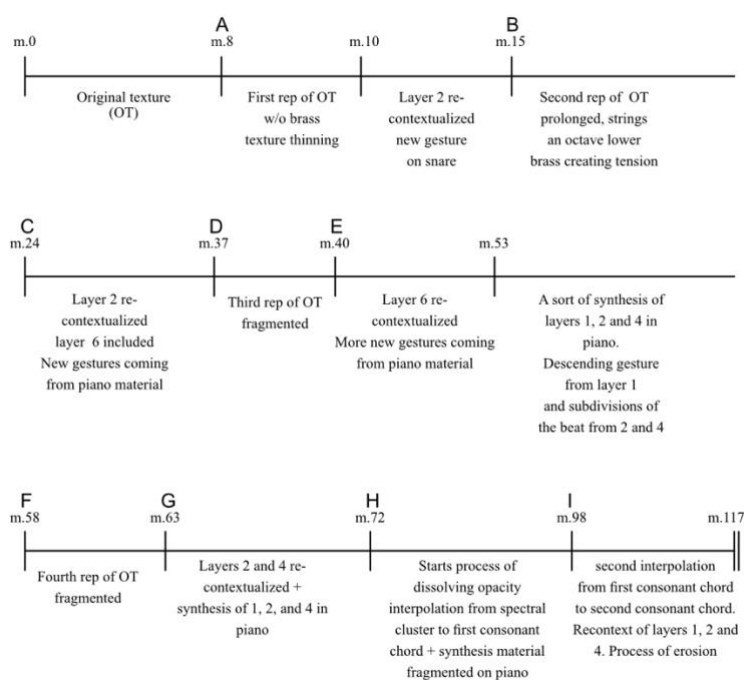


Figure 36. Formal map for *Between transparency and the invisible*.

Dissolving opacity

To me, the last section (starting on rehearsal letter H, m. 72) is the most important section of the piece. It represents the achievement of Gego's goal, the unveiling of the invisible strata. I chose to use a technique of interpolation because the gradual transition between those chords gives me the sensation of something being revealed. It makes sense that I feel this way because the first chord is cluster that is gradually opening its range and is also going from dissonance (opacity) to something more "consonant" (transparency). There are three interpolations happening in this part of the piece. The first one goes from m. 72 to m. 98 and goes from the chord shown in figure 37 to the chord shown in figure 38.



Figure 37. Departure chord for first interpolation.



Figure 38. Arrival chord for first interpolation.

This interpolation has 6 steps, the strings and woodwinds play the members of these chords with different dynamic articulations in the span of 26 measures with moments of "silence" between each chord. Figure 39 shows the different steps.



Figure 39. Steps in first interpolation.

When arriving to the last chord, the piano colors three members of this chord in their closest approximation to the equal temperament (F#, A and C#). This chord was thought as D, F#, A, C#, E, G# and B. Something like a major 7th chord with 9th, #11th, and 13th. I chose the partials that were closest to these pitches and used the piano to reinforce the chord's consonance.

The second interpolation is between this chord and another “consonant” chord.

Figure 40 shows the arrival chord for the second interpolation.



Figure 40. Arrival chord for second interpolation.

This chord was thought as G#, B, D#, F#, A#, C#, the upper portion (omitting the fundamental) of another major 7th chord with 9th, #11th, and 13th. The fundamental (E) is added later. This chord was chosen because it is one step above the previous chord, and this contributes to the sense of arrival. This second interpolation only had 4 steps that are shown

in figure 41. This interpolation happens as a series of interwoven chords in the strings and horns and go from m. 98 to the end of the piece.

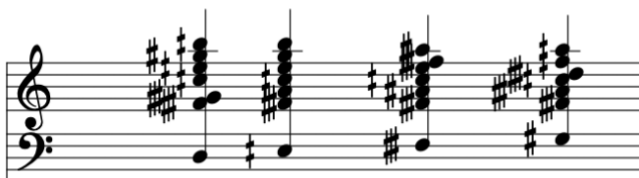


Figure 41. Steps in second interpolation.

This chord's "consonance" was also reinforced with the piano (using B, D# and A#). The last interpolation, which happens simultaneously to the second one, is between these "consonance-reinforcing" triads in the piano and has five steps (see figure 42).

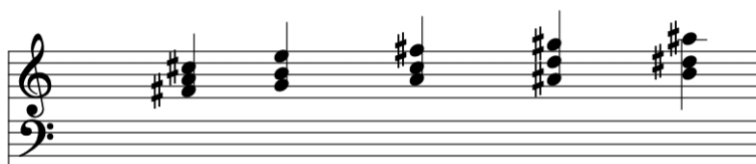


Figure 42. Steps in third interpolation.

The result of these interpolations are some strange harmonies with a sense of progression that eventually arrive to a point of stability (like something has been discovered) by the end of the piece.

Electronics

The electronics for this piece are triggered by the pianist with a Max patch that has buttons numbered from 1 to 7 corresponding to cues marked in the score and piano part. They are played back through speakers that are touching the piano to use it as a resonance box. Electronics are only present in the last section, from rehearsal letter H until the end. Cue 1 to 5 are marked in measures 25, 79, 83, 88 and 94. Each cue triggers a track that corresponds to the first five steps of the first harmonic interpolation in that section and are processed versions of recordings of every chord. The processes used are reverb and pitch shift for the reverb tails. Since the processed tracks are recordings of the same passages where the cues are triggered, the result is a very subtle blur of every chord's texture followed by a reverb tail that is like a ghost of the sounds that were just heard with a very similar, yet strange timbre. It is as if the orchestra's signal was being processed live without the complications of live electronics. The intention of placing the speakers within the orchestra is to blur the line between the electronic and orchestral sounds.

Cue 6 follows the same strategy but for the entire second interpolation (rehearsal letter I to the end of the piece) and with a different sound processing. This track was processed with Michael Norris' Spectral Drone Maker¹⁰ plugin (see figure 43). Even though I could not find information about the exact way this plugin works, as far as I can

¹⁰ This plugin is part of a freeware suite developed by him that can be found here: <https://www.michaelnorris.info/software/soundmagic-spectral>

understand, it is a sort of enhanced FFT filter. I believe it applies a dynamic FFT to the track (which, broadly said, divides the sound into several frequency bands to analyze their content along time) and then delays those bands at different rates creating a comb filtering.

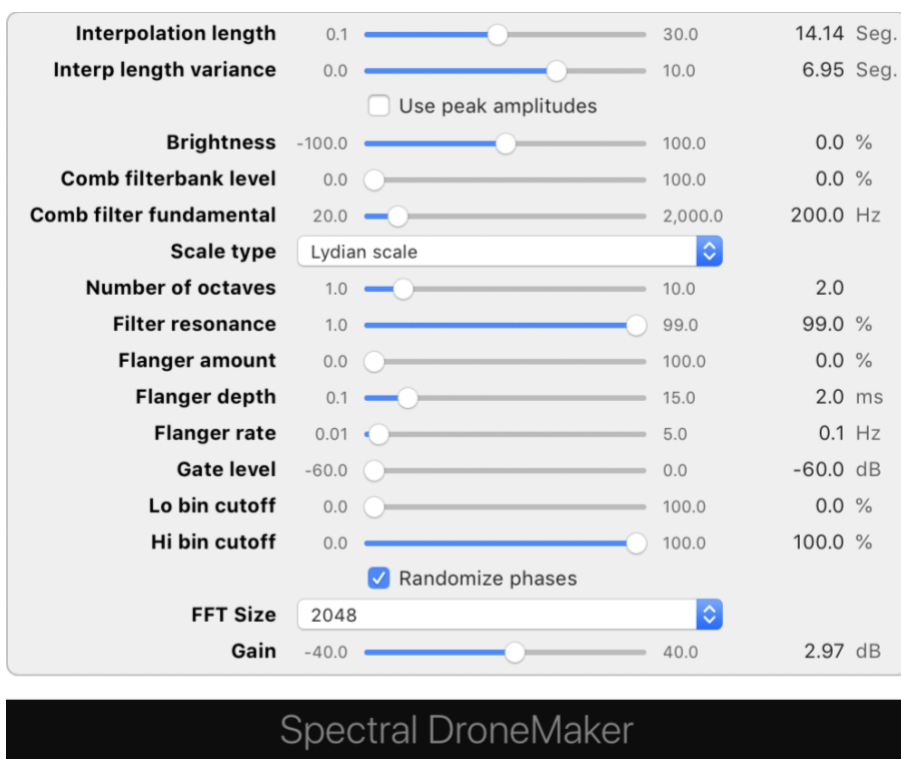


Figure 43. Spectral Drone Maker.

The plugin allows you to change, among other parameters, the interpolation length and interpolation length variance, so I assume that there is an interpolation going on between those delayed bands, which translates into a foggy texture where all you can hear is the spectral content of the track without the attacks that articulate the sounds. The intention behind the use of this process was to smooth out the transitions between the steps in the last harmonic interpolation in the orchestra. Cue 7 just triggers a fade out to the sound.

CONCLUSION

I believe that these pieces reflect my journey during this degree. Each one of them posed different questions and challenges that helped me mature as a composer and helped me find an (at least temporary) solution on how to approach tools and knowledge in a way that I also consider artistic and personal. All these pieces were more than just an intellectual exercise, they were an attempt to share a vision of the world and a sensitivity.

In a more practical side of things, these pieces were my first approach to triggering electronics in real-time, thinking about sound as an ever-transforming entity, and reflecting on the implications of the performers and instruments' physicality in the composition of music.

There are many points of contact between the pieces: similar processes (the process of dissolving opacity in *between transparency and the invisible* and the process in the opening electronics of *situación #3*), similar techniques (the bowing technique using a fishline that *situación #2* and *situación #3* share), similar harmonic material (the use of distorted spectra in *situación #3* and *between transparency and the invisible*), and similar explorations (the use of visual stimuli to generate musical ideas in *situación #3* and *between transparency and the invisible*). These pieces are in constant communication with each other because they are the record of a learning process in which my main intention was to filter the acquired knowledge through my sensitivity, with all its recurrent concerns.

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APPENDIX A

SCORE FOR SITUACIÓN #3

[Consult Attached Files]

APPENDIX B

SCORE FOR SITUACIÓN #2

[Consult Attached Files]

APPENDIX C

SCORE FOR BETWEEN TRANSPARENCY AND THE INVISIBLE

[Consult Attached Files]

APPENDIX D

RECORDINGS FOR THE PIECES AS A ZIPPED FILE

[Consult Attached Files]