# LiveCoding Readings. Algorithms viewed as text/image

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## Abstract

As new ways to represent text/image in unison with other arts, LiveCoding sessions have been one of the contemporary options where the union of music, visuals, algorithms and science get together to make a community experience. The live programming performances where the music or visual result is part of a whole experience that join with the programming algorithms to build a new layer of text that can be experienced not just as a process but as a narrative by itself. The Sound result can be perceived not as an audio performance but as the relationship with the algorithms that create not just a series of instructions but a visual and abstract representation of what you heard combining images to create and share a process.

## Keywords

LiveCoding, Digital, Visual, Music, Receiver, Image, New Text.

## Introduction

As new ways of constructing narratives through more scientific languages, and as part of bringing back the use of algorithms to build a set of rules to conform a more aesthetic visual/sound result, LiveCoding is part of the contemporary practices in Art, which uses it along all kinds of knowledge to experience aesthetic processes. As told, the use of algorithms is not new in art. During the 50's, Ben F. Laposky[1] created a series of pictures called "Electronic Abstractions: Oscillons", generated through algorithms on an oscilloscope that produced wave shapes. Since then, the use of a specific language, plus the construction of modern computers, allowed other ways to produce culture. LiveCoding is, as Alex McLean[2] describes: "writing in a computer program while it runs". We are now able, not only to show the sound/visual result, but also the code itself, as part of a sharing process. The projection of the code transforms into a complex language to communicate something to the interface, as well as a piece of a visual section that interacts with the spectator. So, at the end, even though it is a complex perception, the challenge -as McLean[3] said-, is to build new forms of making an enjoyable programing code screening for every audience and, therefore, to construct and make possible the interaction between a range of different texts, perceiving text as an image, and an image as something that we recover from our historical memory archives.

## The Communication Practice in LiveCoding

From an emerging perspective, one can't consider any human action without a communication practice, where images are created during the interaction. On the other hand, classical communication model consists of a transmitter, a message containing a code, and a receiver. But this model does not help us anymore to perceive what is happening with LiveCoding as an emerging artistic practice. During LiveCoding Practices, both, transmitter and receiver, manifest themselves within a specific context sharing images as the common element that both are capable to enjoy, even if they do not know anything about how LiveCoding is done. They do not need anything to discover common images, because many of them belong to collective memory archives: including the exploration of a logical use of programing code. However, it is necessary to update the communication practices, since models that help us to organize our thinking are not immutable.

## Practices

In artistic productions like LiveCoding sessions, which is not a linguistic manifestation but live programming used to generate feeling experiences, there is a chain of riddles that has to be updated by the receiver as well as by the transmitter. LiveCoding sessions are images that belong to the body, as Hans Belting says in his book "Anthropology of the Image"[4]. So the receiver is transformed into an actor instead of being only a contemplative body. This one opens its own archives to activate images to make connection with the code itself and its graphic composition. From this perspective, there is nothing to understand, because there are not messages to transmit, but there are images that are open during the experience of living a LiveCoding session, and are shared in community. On the other hand, the transmitter produces or builds sensitive real-time immediate experiences, and consumes and produces the image as the receiver does it. It is a fact that the transmitter and receiver are presented in LiveCoding sessions not as opposites, as they are presented in the traditional communication model, but as two active elements interacting within a context that defines, perceptively, the programing language used, in this case, "productive or constructive coding". We do not call it "creative coding" because there is nothing to create, and particularly, because nothing is created if we do

not open archives from our historical collective memory. We do not create anything, we produce or build images taking as a start what we have experienced and learnt. But, which are these kinds of images? Are they expressive? Are they poetic? Are they practical? Are they common images? We do not need to forget how we perceive images. Images are contemplated in its widest range of possibilities. We want to say that images are considered as sound and visual, shape and content, particularly, because the shape is already given, so we need to work with the content, that is a synonym of idea. In this emerging communication practice both, the transmitter and the receiver, become triggers of opening images archives they active on. On one hand, there is a manifestation from the transmitter, which will not only generate images as feelings that the receiver has never experienced, but also will make this person conscious about opening his o her own archives (conscious or unconscious) during the LiveCoding session, while they are making their proposal, manage information, perceive the constructive intention of the images, and the enunciation to recover a historical image body loaded of all their immediate references and their entire historical archives that are not seen in the use of the production. This is the point when LiveCoding, as an image body, generates what we call "new feeling".

On the other hand, receivers, like the transmitters, but in backwards operation, face the problem to generate images that are going to be perceive by themselves in order to feel them; the issue to identify the transmitter's production; perceive the goal of the LiveCoding session; feel the crash between, the personal own images opened form collective archives, and the images given by the transmitter. These interactions now acquire a perceptive and generative character, because they address receivers, depending on his immediate and historical images and the fact that both are able to make meaningful the programming constructive code. This is also the moment in which empathy is given between the image body (perceiving the image body as LiveCoding session) and the receiver; thus, both operate on it. At this moment the LiveCoding session is a heap of information that receivers must update, otherwise it is incomplete. As Hans Belting[5] says, there is a missing link between transmitters and receivers where they do not interact with other system of thinking the image that converge on LiveCoding sessions for the reason that it is riddled with unsaid and invisible things.

## The Image

LiveCoding sessions are corporal images. They are made using algorithms. It is not given from a context where the distance between transmitter and receiver is like in the traditional communication model. In these, the distance, between the main communication's actors, does not exist. Instead, the main goal is creating a community. Community is understood as a group of receivers/producers that can and have the opportunity to interact and create a meaningful dialogue during and after LiveCoding sessions. Therefore, the concept of LiveCoding goes beyond sharing the

screen. It is the practice where images, generated between code/algorithm and visual/sound results, by the programmer, and the spectator is vital. Where a bond will be created and will last beyond the moment of the session itself.

LiveCoding makes use programming-codes for the implementation of immediate and unrepeatable pieces for both: programmer and spectator. So, a connection exists between algorithmic writing and the product, as well between transmitter and receiver. The projection and speakers give the space/time bifurcation between the computer and the product; it is what the receiver (audience) witnesses in real time, which result in the modification of instructions, processes, and information that the receiver legitimates the production beyond from an aesthetic or artistic discussion. Thereupon the transmitter is able to establish strategic, as Hans Belting[6] says: images are democratic and translate them into an action that takes place in a space/time shared by the transmitter and the receiver within an image body. In LiveCoding sessions, there is convergence an emerging way of thinking the image as complex as the image is. It does not matter if it is musical/visual languages, algorithms, digital media, grammatical semantics of the textual body, etc. As previously stated, the communication model needs to be updated. Specially, due of the fact that new practices are emerging, such as the programming code is employed in LiveCoding sessions.

## Author/Transmitter/Builder/Actor/Activating

In this adaptation of the communication practice: LiveCoding sessions, authors remain as ghosts operating as archives openers within the image body, in order to be active actors building an immediate and active image or recovering that image from the memory through algorithms. The cooperation between image body and receivers goes away from the ghostly figures of the relationship that they have with regular texts. Authors' role in a LiveCoding session is present, immediate and irreproducible, since it occurs in real time. From this perspective authors, as consumers and producers of images, are also builders of immediacy, instantaneity, spontaneity, and experimental experiences. Their presence is crucial as trigger of the process that will take place when the receptors are collaborating with the image body, communicating impressions and perceptions, converging on a space/real time, betting on the construction of the transmitters as builders of the simple image body, but complex in their perception and reconstructions of images.

When the receivers open an image from their historical archives, is similar to opening a world of meanings that converge in its conceptualization. Considering the single concept of "salt", say in the immediacy of usage. This opens the door for the meaning of "seasoning", but also reveals its historicity to let us know that, at some historical point, "salt" meant "money", "conservation", "travel", "marketing", "exchange", "sodium chloride", "kitchen chemistry", "laboratory", etc. The concept of "salt" has mutated through history, but that history has not been re-

moved from the concept itself, it has rather been absorbed by it. This suggests the way in which the concept of receivers has mutated into a viewer/trigger, although their passive role is contemplation. The receivers as consumer and producer of images confront, in the image body's space, their own perceptions with the perceptions of the transmitters. Their own immediate and historical memories, the elements that have allowed them to adapt to the space/time to get into the more complex conceptualization of the same space/time where now he/she is nothing more than a viewer, but they can act, in the sense of collaborating within the context altering their own perception and the perception itself. However, this trans-mutated Receiver/Viewer/Activating/Actor collaboration is not simple.

## A) Receiver/Viewer/Activating/Actor Basic Visual/Sound.

This kind of receivers are the ones who, first experienced a LiveCoding session and faced the bombing of images systems that they had to interact with, and has two options: accept it or reject it.

1. This kind of receivers accept LiveCoding because they have the pseudo-conceptual skills to experienced, or have the attitude of being exposed to new aesthetics experiences. Aesthetics is perceived as: the first time, the viewer exposed himself to the experience LiveCoding sessions. They are newbies introduced to the world of programming constructing code which converge in building images, sounds, grammar, mathematics, psychedelia, etc.

2. These kind of receivers reject LiveCoding in terms that they reject both: digital technology as a tool which allows to mix, apparently, different images (sound and visual), and to be challenged cognitively in order to be exposed to complex image body that has to be learned in order to be experienced, and at the same time processed.

## B) Receiver/Viewer/Activating/Actor Synthetic Visual/Sound.

These receivers are neither newbies, nor experts in going LiveCoding sessions or writing algorithms structures. They have cognitive skills capable to live a Visual/Sound experience given by LiveCoding sessions. They are interested in getting involved with constructive processes through digital technology, access to it and see the potential for this process but they do not consider it as art. Thus, these kinds of receivers have the opportunity to access by two approaches to the Image/Algorithm:

1. Examining readily recognizable concepts, since programming code that are used in these platforms are based on structures that are built with English words. So, a simple instruction like /*color (255)*/ in the Processing platform can lead receivers to the conceptualization of what is happening in real time. In this case, a visual result through the word "color".

2. Receiver tend to explore visually any algorithmic result, not as a series of instructions that impact immediately in an audible and/or visual result, but in a series of graphic elements that reminds the textual body exploration. Not as communicative result itself but as graphic compositions and explorations that visual producers like Joseph Beuys performed in some of his paintings in which he wrote a list of objects, for the simple fact that graph words generate an image aesthetic sense.

## C) Receiver/Viewer/Activating/Actor Specialist Visual/Sound.

These receivers are part of the community; converge in constructing and collaborative processes that accurately communicate perceptions of using of Digital Technologies and Programming Codes experimentally and immediate real experience LiveCoding sessions. They know and manage several programs that are used in these practices and, at least, they are specialists in some of them in two areas where LiveCoding sessions happen: the use of programming code of the image, or the use of sound programming code. They are not exactly Visual Artists. Fitting here, there are professional people interested in the phenomenon of the use of a specific programing languages, and even scientists, who are engaged in design, image construction, knowledge of sound code, exploration of sound, animation, etc. They are productive, and they are generally engaged with the movement, producing, collaborating, managing, educating, disseminating, promoting, offering festivals, and constructing community. This is the highest level that is both: an Author /Sender/Builder/Actor/Activating and a Receiver/Viewer/Activating/Actor

These three kinds of receivers converge on a single space/time and they are classified like this for mere research purposes, but the same receiver may go through the three stages. Perhaps the richest of all receivers and the one in the widest communities, is the Receiver/Viewer/Activating/Visual Synthetic Actor/Sound, in a second instance, receivers tend to access the platforms using programming codes and the community itself, and then transform into a Transmitter/Programmer and a Receiver/Viewer/Activating/Actor Specialist Visual/Sound.

## Example

In order to materialize we will explore an example of the Mexican composer/programmer Alejandro Franco Briones. As part of the ideological narrative of the code, this was projected outside the Blas Galindo Hall, the Hall of an important orchestra named "Carlos Chavez". As critical point of view was intended when questioning the real meaning of an orchestra: What does it symbolize? And then using a Silvestre Revueltas orchestra piece (1938), that actually was based on Sensémaya's poem (Nicolás Guilén, 1934) -a curse poem-, the LiveCoding intended to dematerialize this piece, transforming the original narrative and then destroying it and let it penetrate the walls of this Hall.

The code then can be read in three stages, we are going to explore the last two stages, B) Receiver/Viewer/Activating/Actor Synthetic Visual/Sound, when the actors can identify symbols easy recognizable and see the graphic construction of the code itself; and C) Receiver/Viewer/Activating/Actor Specialist Visual/Sound when the actors can perceive the code in a specialized manner, identifying not only the symbols, but also the structures and the objects. As the first one talks about a superficial perception of the code, a newbie will hate it or love it, we are going to skip it for this example.

**B) Receiver/Viewer/Activating/Actor Synthetic Visual/Sound Reading.** When we skipped the code really fast we can at first identify some recognizable language forms that identifies the ideological intentions of the programmer. In the second 41, a .wav file is called, the lines respond to: /*a=Buffer.read(s,"sounds/laculebra.wav");*/ the name of the file was made for receivers to identify the aspects of "culebra", a "snake", then a variable is defined: /*~laOrquestamuerta={Pan2.ar(PlayBuf.ar(2,a.bufnum ,0.8),0)}*/ with the name "La Orquesta Muerta", the "Death Orchestra" using the analogies and some critical lines of things you cannot do inside of an Orchestra's Hall, the programmer continues to set names of variables that distort the sound of the original version of Revueltas' piece that he called at the beginning. Names as /*~nopuedeComer.play*/, "it can't eat", /*~nopuedeSilbar.play*/, "it can't whistle, /*~nopuedeCorrer.play*/, "it can't run" continuously appeared and were modified and distorted during the 10 minutes and 15 seconds that the LiveCoding piece lasts. On the other hand, words as /*.play*/, that we have in these example, can be easily identified as something that is being reproduced, as the quote /*.stop*/ that implies something is not supposed to play anymore. With this possibility of reading, transmitters have the opportunity to connect with receivers and send them messages; there is a possibility to connect with people through the bounding of narrative representations inside de text/code. On the other hand, receivers can connect with the graphic composition of the structures, we can see in this example, that the whole real-time experience, and the composition/writing of the algorithms conforms a whole visual composition by itself.

**C) Receiver/Viewer/Activating/Actor Specialist Visual/Sound.** This stage of code perception becomes a more social construction. Perception is made in community, not only individually. This is where "LiveCoding practice transforms into a social space" as Michaud (2003), said. The community builds knowledge, and through this, members are capable to perceive a specific language. Mainly, what is happening on the code is that: an audio file is called in order to be destroyed by a sine wave of sound. In the line:

```
/*~nopuedeComer={Splay.ar(SinOsc.ar((2000..2040),0,0.5))}~
   nopuedeComer={Splay.ar(SinOsc.ar((2000..2040),0,0.1))}~
   nopuedeComer= {Splay.ar(SinOsc.ar((2000..2050),0,0.1))}*/
```

The variable "nopuedeComer" is making a sine that oscillates, with a frequency that goes from 2000 to 2040 hertz, then with the other lines, de sound waves vary the ascendant way of the frequency values. Later on a low frequency sound is added through a Noise object: /*LFNoise0.ar*/ and /*LFNoise2.ar*/ multiplying the sine. Almost at the minute 6, /*convolution.ar*/ is made by mixing two objects, the file thought the variable named /*~laOrquestamuerta.ar*/ and a sine wave made by the variable /*~nopuedeComer.ar*/ multiplied by another sine. A minute before the end, objects as /*GVerb.ar*/ and /*Ringz.ar*/ appeared making a reverberation in the sound, later on with the use of a /*Pan2.ar*/ the information is reproduced through two speakers, making different sounds in each one. At the end there is repeated convolution between variables multiplying the sound with different amounts of distortion until all the sound stops [/*.stop*/].

## Conclusion

This last example shows the possibilities of these contemporary music/visual sessions. These kind of practices can not be perceive with a simplistic point of view of a work of art that can be sell or that can be held in a museum of gallery context. So, these practices do not need somebody, as a curator but a community that works as a medium of learning process to create not just readers but producers. Music and Visual, in these practices, need to be considered as a whole experiences where visual, sound and narrative process is held, this context is where all kind of texts get together to make something different every time, that can not be repeated it as the same thing. It is a work of art that is constantly changing, and the possible connections between texts defers of the receiver's knowledge or approaches.

## Acknowledgements

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Jessica Rodríguez studied Visual Arts at the Universidad Michoacana de San Nicolas de Hidalgo in Morelia, Michoacán. Cofounder of Andamio, a collaboration project. She has participated in several Festivals giving talks about her work and thesis investigation. She, with Andamio has been doing distance collaboration projects with La Ratonera in Chile and La Santa in Ecuador. Now she is working at CMMAS [Mexican Center for Music and Sonic Arts] in design and video production. Also she is nowadays investigating the role of technology in the Latin-American productions, installations and performances that uses various forms of programming codes to create different kind of interactions in their pieces.

Rolando Rodríguez Guízar studied Education and Communication and right now he is studying his Master in Contemporary Art at the University of Arts in Aguascaliente, México. Co-founder of Andamio, a collaboration project. For a long time he's been writing and promoting cultural events, as well as, producing his own artistic pieces. He's won several writing contests in México, and making a lot of presentations about what he does. Lately, Andamio was selected to make a presentation, a workshop, two researches and chat at the Image Festival in Manizales, Colombia. This month we made a presentation on line at the UVM in Brazil, and next august, we will present our researching results about our writing called: LiveCoding, algorithms viewed as a text.