Live Coding From Scratch: The Cases of Practice in Mexico City and Barcelona

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 ICLC 2020, February 5-7, 2020, University of Limerick ,Limerick, Ireland

Abstract

Live coding performance starting from a white screen is commonly termed from scratch. In this contribution, we present some thoughts about the possibilities and consequences of this technique, based on our experience as members of the live coding communities of Mexico City and Barcelona. For that, we described from scratch rules and definitions of each community and then, we comment on how this practice began at each place. We finish the text discussing why we consider that live coding from scratch is a technique whose practice can be used as an epistemic tool, through which new creative spaces and limits are explored.

Introduction

Writing code in a blank document against time is a well known live coding practice called from scratch. For example, the one hour practice of Fredrik Olofsson during a hack pact [1], the nine minutes live coding sessions in Mexico City[2] and Barcelona[3] or some networked performances by Cybernetic Orchestra[4]. This practice can be observed either in a concert or as an exploratory process. In this paper, we reflect on the from scratch live coding technique used in the live coding scenes of Mexico City and Barcelona, where the 9 minutes challenge shapes the way to approach it. We also discuss how the from scratch practice developed a sense of meaning of live coding at the beginning of the Mexican scene, how this practice have been developed since then, as well as how the from scratch practice have been adapted and developed in live coding sessions in Barcelona.

[1] It is possible to see here: `https://fredrikolofsson.com/f0blog/node/7`

[2] As you can see in the first videos of the audiocmmcenart Vimeo player: `https://vimeo.com/audiocmmcenart`

[3] `https://toplapbarcelona.hangar.org/index.php/live-coding-sessions/`

[4] For example, `https://youtu.be/vBJeK1wDRJU`

Motivation

This text is written collaboratively; the ideas presented here about the from scratch technique and its practice come from our experience as organizers and participants of the live coding communities of Mexico City and Barcelona. The text covers different periods of time and space: the live coding sessions organized by the Taller de Audio of the Centro Multimedia (CMM) in Mexico City between 2010 and 2014 and the sessions currently organized (since May 2018) by Toplap Barcelona in the Hangar Center for artistic research of Barcelona [5]

From Scratch

We begin by stating two possible definitions which ponder to some extent on the practice in the aforementioned communities and how a sense of meaning about the live coding practice was built from those definitions.

Definition and Meaning

A proposed definition of from scratch is to write code in a blank document against time. From this proposal these questions arise: What kind of aesthetics produce this practice? and What it means to write code as an artistic practice? Back in 2010, in CMM's Mexico City community there was not a clear definition of the term live coding beyond some references to Toplap website and the SuperCollider JITLib Help file. So, from scratch worked as a synonym of live coding, that is to say, in order to consider a computer music or visual performance as live coding it must began from a blank screen. As Dave Griffiths (2012) observed during his participation in the /vivo/ Symposium "the from-scratch technique is considered important in Mexico, with most performances using this creative restriction to great effect", or as Eduardo Ledesma (2015) points, when he analyzes the visual work of Mitzi Olvera, "Mexican-style live coding is considered to be a slightly rougher variety which begins from scratch, not relying on a pre-programmed material, and slowly builds to greater visual and aural complexity as the performance intensifies" (p. 114). The definition of live coding in Centro Multimedia can be observed in its web site, this definition assumed the origin of live coding as sonorous with an extension to the visual: "live coding is the practice of programming in real time, usually linked to computer music and with a paragon to music improvisation, this activity has also extended to video-animation" (Centro Multimedia CNA n.d.). Later, this definition changed assuming that music and visuals are the aesthetic discourses of live coding: "live coding is the practice of writing code live to generate aesthetic discourses as music and visuals in real time" (Centro Multimedia CNA n.d.). The definition used by TopLap_Barcelona is: 'The from scratch technique consists of playing live for 9 minutes starting from an empty screen. In this way, it allows to visualize the high or low level of the languages (try to play from scratch using, for example, Tidal, SuperCollider or Csound), making transparent the tools (classes, functions, data structures, etc.) that allow the live coder to carry out the different musical tasks within the performance. These sessions seek to take advantage of the empty screen restriction and the 9 minutes to explore new possibilities' (TOPLAP_BARCELONA, n.d.). These definitions created common spaces that narrowed the practice through which the communities identified themselves.

Live Coding from Scratch Experiences

In Mexico City

We have discussed some definitions and the construction of meaning of the term from scratch, but How live coding started in Mexico? Live coding sessions in Mexico City began in Taller de Audio del Centro Multimedia CENART at the end of 2010 after a series of artistic and educational events. The first antecedent can be seen in the work of

[5] https://hangar.org

Figure 1: First live coding session, Galería Manuel Felguérez del Centro Multimedia, Mexico City, December 2010. (By Hernani Villaseñor)

multimedia collective mU, formed by Ernesto Romero, Ezequiel Netri and Eduardo Meléndez who made a few live coding concerts during 2006[6]. Later, in July 2009, the concert Prácticas con código vivo[7] by Ezequiel Netri. Education was important to conform the live coding practice in CMM. We can mention the series of SuperCollider courses that took place from 2007 to 2014, which included a discussion of the live coding topic defined by the JITLib and ProxySpace. We can also mention the courses of Processing, Pure Data, VVVV, OpenFrameworks and Fluxus that were strong influenced by a FLOSS discourse. After a few years, regular assistants to these courses had a creative programming background. The Taller de Audio members thought how to invite them to take part in the concerts of the CMM. One proposed activity was to organize computer music concerts that include the live coding practice using SuperCollider ProxySpace as well as other techniques and programs[8]. The first concert came true after a Fluxus workshop, taught by Luis N. Del Angel in 2010, to show the works of the students in public alongside regular students of other courses who figured out how to live coding sound for the first time. The idea was to program from scratch visuals or sound with Fluxus and SuperCollider[9].

After this concert the Taller de Audio continued organizing live coding sessions in the CMM with the same dynamic: around 12 participants from an open call organized in pairs, one participant coding sound while another coding image in a limited period of time established in 9 minutes after a few sessions[10]. This is described by Jessica Rodríguez (2014) who points out the construction of a community during these sessions alongside the ephemeral and changing nature of live coding improvisation, what Carolina Di Próspero (2015) refers as the construction of sociability and subjectivity in practices as live coding. The first year the Taller de Audio organized one session per month in the installations of CMM, and in 2012 started to collaborate with different institutions. That year the First International Symposium /*vivo*/ was organized dedicated to the topic of live coding. From late 2010 to 2014, the Taller de Audio organized around 30 live coding sessions from scratch including CMM and different institutions.

After that period, live coding in Mexico has taken different paths and modes of production oriented mainly to dance music[11] and visual live coding, as well as different ways to organize events, outside and inside official institutions. Also, it is possible to observe a strong commitment to visibility and inclusion[12]., the development of own tools and the reflection of the practice inside academic contexts[13]

[6] `https://toplap.org/wiki/ToplapEvents`

[7] `http://cmm.cenart.gob.mx/cartelera/2009/julio.html`, scroll down to Sinescenia

[8] This was described in the talk 9 minutes from scratch: a story of live coding in Mexico by Hernani Villaseñor and Alexandra Cárdenas, in the Symposium of Live.Code.Festival, Karlsruhe 2013 (Hutchins 2013).

[9] `http://cmm.cenart.gob.mx/cartelera/2010/diciembre.html#livecoding`

[10] `http://cmm.cenart.gob.mx/cartelera/2011/enero.html#livecoding`

[11] For example, Ocelotl et al. (2018) mention that the band RGGTRN "has evolved into a collective that engages in algorithmic dance music and audiovisual improvisation informed by the Latinx context that revolves around its members"

[12] For instance, `https://hbrdsyqmrs.wordpress.com/`

[13] For instance, `https://piranhalab.github.io/comunidad.html`

Figure 2: Arinoise (left) and Mitzi Olvera (right), 18th Live Coding Session in Sciences Faculty UNAM, Mexico City, August 2012. (By Hernani Villasñeor)

From Scratch Rules in the Centro Multimedia Live Coding Session

- Write code from scratch in order to generate sound or image in the preferred programming language.
- In nine minutes.
- Stop when the audience applauds.

From Scratch in Barcelona

Ever since May of 2018, from scratch sessions have been carried out once a month by the Barcelona TOPLAP community[14]. By the time the first session was organized, Barcelona has had three Algoraves, live coding was known, but the from scratch technique was not a common and well defined practice. The idea was to start the TOPLAP node with a live coding session using the same rules of the Mexico City sessions, to emphasize the writing of the code in real time (Barcelona already had a tradition with languages such as SuperCollider or PD. However, performances were conducted mostly using prepared systems). In subsequent events, as in the case of Mexico, modifying pre-written code was also allowed. Nonetheless, the community continuously practices from scratch performances in the sessions. Proof of this are the two from scratch sessions held in January

of 2019 during the /* VIU */ festival[15], a moment that also brought together the live coding communities of Mexico City and Barcelona. Unlike the Mexican scene of the late 2010, that with some exceptions was quite homogeneous in the tools, since the first session the polyglotism of the Barcelona scene was clear (SuperCollider, Tidal, Sonic pi, Max MSP, and C++ were the languages used)[16]. This immediately brought to the discussion the next questions: How the differences in design and abstraction level of the programming language, impact its sonority, complexity (in terms of the number of lines needed) and readability? Also, what kind of sonority and form do the performances have, according with the tool, when using only the original resources that the program has? Since the first session, the from scratch restriction has been used to explore these questions, up to the limit of using bash, and C++ to emphasize the possibilities

[14]TOPLAP Barcelona started as a resident collective in Hangar on May 2018 https://hangar.org/en/residents/collective-residents/toplap/

[15]`https://toplapbarcelona.hangar.org/index.php/viu-en/`

[16]You can see a from scratch session in Barcelona: `https://youtu.be/IJPKeKZ6bv0`

and aesthetics of working with low level languages[17], or packing the code into classes to increase the readability and compactness.

From Scratch Rules in the Hangar Live Coding Session

For the public:

1. Live coding sessions are gatherings to practice with public, either from scratch or re-writing/modifying written code.

2. All attendees should applaud at the end of 9 minutes (remember that this is just for fun)

From scratch rules for the coders:

Each live coder (audio or visuals).

1. Start with the blank screen

2. You have 9 minutes to play

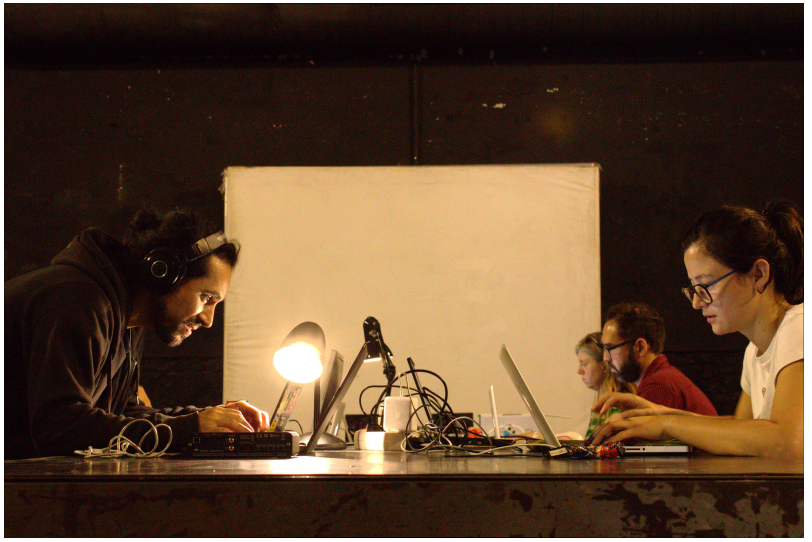

Figure 4: Iván Paz, Lina Bautista, Gabriel Millán ang Alicia Champlin, live coding form scratch session, Hangar, Mayo 2019 (By Silvia Miranda Arana)

Ideas Beyond From Scratch

Consequences for the Performance

In a from scratch performance the live coder demonstrates writing skills and the unfolding of the piece, as it is constructed in real time, gives insight to the composer's mind. The public, who does not know this practice, tries to understand what is happening during the events. In this sense, very clear and simple explanations are required. On this point, Alexandra Cárdenas (EFEAV 2019, 00:01:27) comments that

[17] In a personal conversation with Niklas Reppel he said that he decided to use C++ in the first from scratch session of Barcelona to emphasize the idea of "not using anything prepared" after that, in a session during the III International Conference on Live Coding, he received comments saying that he had started with code on the screen (using his live coding language Megra)

Figure 3: Lina Bautista and Citlali Hernández live coding from scratch, Sala Ricson, Hangar Barcelona, Marzo 2019 (By Iván Paz)

it is not necessary to know how to play the piano to enjoy a concert, since certain structures are familiar to the public, for example where the high and low pitches are located. Little by little, this coarse structures are being created as the public becomes familiar with the code. The error that happens during the code writing has been widely discussed (Collins et al. 2003). Besides coding errors, some failures appear during from scratch sessions due to constant changes of computers; sometimes no soundcheck or projector test are carried out, then the input of the projector is different, the sound card is not configured, the screen size is modified or sound does not come. All types of errors, as they are part of the performance, are embraced by the live coders and integrated into the aesthetics.

Tools Implications

Live coding from scratch shows the code to the public with the intention of sharing, being open, and to give access to the performers's mind (TOPLAP n.d.). Restricting from scratch practice to "vanilla" distributions of the programming languages (using the programs as they are downloaded) as some people suggest, also guarantees that the tools used during the performance can be studied/used by anyone that downloads the program. In this way the idea of accessibility is reinforced. But this maybe doesn't apply for audience, such as Herrera Machuaca et al. (2016) observe, they say that after years of performing in live coding sessions and concerts as Colectivo Radiador "we began to notice that only the programmers in our audiences received the performances well. Programmers were interested in the code we projected on screen, but the rest of the public was less interested" (p.118). Their solution was to translate their live coding language into one more related to audience understanding[18]. So the open and access to code can be questioned in relation to the knowledge of programming.

Poetic Implications

As we mentioned, the temporary restriction during from scratch performance pushes the performer to find more efficient code structures and syntax (e.g. concise, compact, succinct), to, with the least amount of characters, achieve to develop a complete piece. Time constraints and starting with a blank screen make the technique from scratch ideal for visualizing the role of the "level" (e.g. high or low) of the programming language in performance. This, most of the times, imprints a specific sonority in the resulting performances. For example, the first live coding sessions in CMM Mexico were characterized to figure out how to perform in short time writing code; sometimes in nine minutes a SynthDef was written with no sound at the end of the time, so the question of What means to write code in front of an audience arise at some point? Other times participants used strategies such as transcribe, memorize, or write minimal lines of code. These approaches pushed participants to write fast or search for functions of the programs that do a lot of image and sound with few code; in reference to Marije Baalman (2015) they were adapting mind and body to the code as "code embodied by the human" (p.36).

Machine Learning From Scratch: On-The-Fly Training

During the MIMIC artistic summer workshop held at the University of Sussex during July of 2019[19], the current approaches for using artificial intelligence (machine learning algorithms) in Live Coding were discussed. One of the current discussions on this issue is whether

[18] This can be observed in the next video: `https://youtu.be/m03pay7A44k`

[19] `http://www.emutelab.org/blog/summerworkshop`

[20] Including the data collection of the training set

the training process of the models should be done offline or on-the-fly[20]. In the second case, the model training can be included as part of the performance, however the time required depends on the size of the training data set. One of the performances presented at the end of the workshop was carried out by Marije Baalman, who trained the model on stage, so that the training process became part of the performance. In contrast to some other performances that used pre-trained models (from which model instances were taken during the performance) this from-scratch-training had something that remained the live coding from scratch performances. In this case, the algorithm response, the data being collected, etc. can be inferred by the public while the time restriction shapes the performance. From this perspective, the idea that starting from scratch visualizes the limits and functioning of what is being written can be extended to the new live coding tools.

The Term of Live Coding as Creative Constraint

On-the-fly writing of code through interactive programming is a way of approaching tasks where no clear specification of the problem to be solved can be given in advance, e.g. when the exact form of the solution is not known in advance or when only a draft of the idea is available; problems in which we only find the exact form of the solution when it is found. In these situations (which are not unusual in artistic research), the formal structures of the programming language provide the environment to explore, in real time, the different possibilities to conduct the search within the space. Even when we already tested certain structures, when performing from scratch, the restrictions imposed keep us practicing this type of search. The from scratch practice can be understood as an exploration tool (in specific conditions) that allows to find the first possibilities of a language, visualize the available abstraction levels, and glimpse different possible paths. Then, although the languages change, it is still a valid approach. As it could be the case of training a machine learning model in real time (as discussed in Section 5.4).

Conclusions

Live coding from scratch is a creative technique that emphasizes (visualizes) real-time code writing. When a temporary restriction is added, the abstraction levels contained in the programming language (is it low or high level), the design of the program (for example the cycles in the case of Tidal), and the virtue of the live coder to use these elements to create a composition or moving images are visualized. The sonority (timbre, structure, form) or the visual part of the performances exhibits the immediate use of the sound and image generators, sequencers, task definitions, etc. The tools that the live coder has more "at hand". In live coding, the gesture is expressed through the code, as it is the code (its writing and its execution) that conducts the performance. This is emphasized in a from scratch performance since the public can more easily follow the writing. The challenge engages the performers since, besides the performance, it is also a way to explore. It is a way to know the limits of the software, as well as its possibilities and response in specific conditions. That is, how far it can go, or what kind of pieces can be made with, for example, a vanilla version of SuperCollider in nine minutes. What audio generators work for tasks such as creating sound textures, synthesizing kicks, producing melodies, patterns, etc.? From this perspective, the nine minutes challenge is a way to find new things, to explore the limits of the software, to find ideas for other compositions. Zlatko Baracskai once said that if you find it difficult to eat pizza with your hands, you could try it without hands and then, you will see that when using only your hands again, it seems the easiest thing in the world. This analogy illustrates some of the sensations of the challenge. In the context of the scenes and communities of Mexico City and Barcelona, live coding from scratch have been practiced at different moments, from where different things can be observed. For example, in Barcelona, having C++ and Tidal Cycles in the same session clearly visualizes the levels of abduction in programming. In the case of the Mexican scene having more homogeneously distributed tools, such as SuperCollider and Fluxus, allowed the challenge to be a

shared exercise from which to learn from others (for example, the use of ProxySpace), thus generating a sense of meaning and sociability of the live coding practice. In this regard, the definition of a practice and the construction of a community through a technique.

Acknowledgments

There are many people involved in the organization and conformation of both scenes and communities. We want to thank all who participated in live coding sessions, the members of Taller de Audio including the people of social service, and all in CMM CENART who made design, documentation, dissemination, tech support and space security, also the institutions that hosted the live coding sessions. In the case of Hangar, we thank the whole live coding community involved and the support of the Hangar team. Hernani Villaseñor acknowledges the support provided by CONACyT through Music Master and Doctoral Program UNAM.

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