Alignment of Rhythms in Live Coded Audio-Visual Performance

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ABSTRACT

This paper explores the concept of rhythms and Lefebvre's Rhythmanalysis (2014) as found within live coded visuals and sounds. It will then explore the work of the live code collective Codie, who perform visuals and music at events such as Algoraves.

INTRODUCTION

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Live coding is a performance practice using computer programming environments that can be modified in real-time. Often the code underlying the performance is presented alongside the performers themselves, allowing transparency and inviting the audience to follow along as algorithms are re-written and changed as the piece progresses. "It directly confronts the role of computer programmers in new media work by placing their actions, and the consequences of their actions, centrally within a work's setting." (Collins, 2011) Because of the form's roots in electronic dance music and its needs to align light and sound in live, improvised performance, rhythm emerges as a central concept in this form.

In the same way that livecode works to foreground programming in new media art, it creates a space to experience and understand rhythmic relations as sketched by Henri Lefebrve.
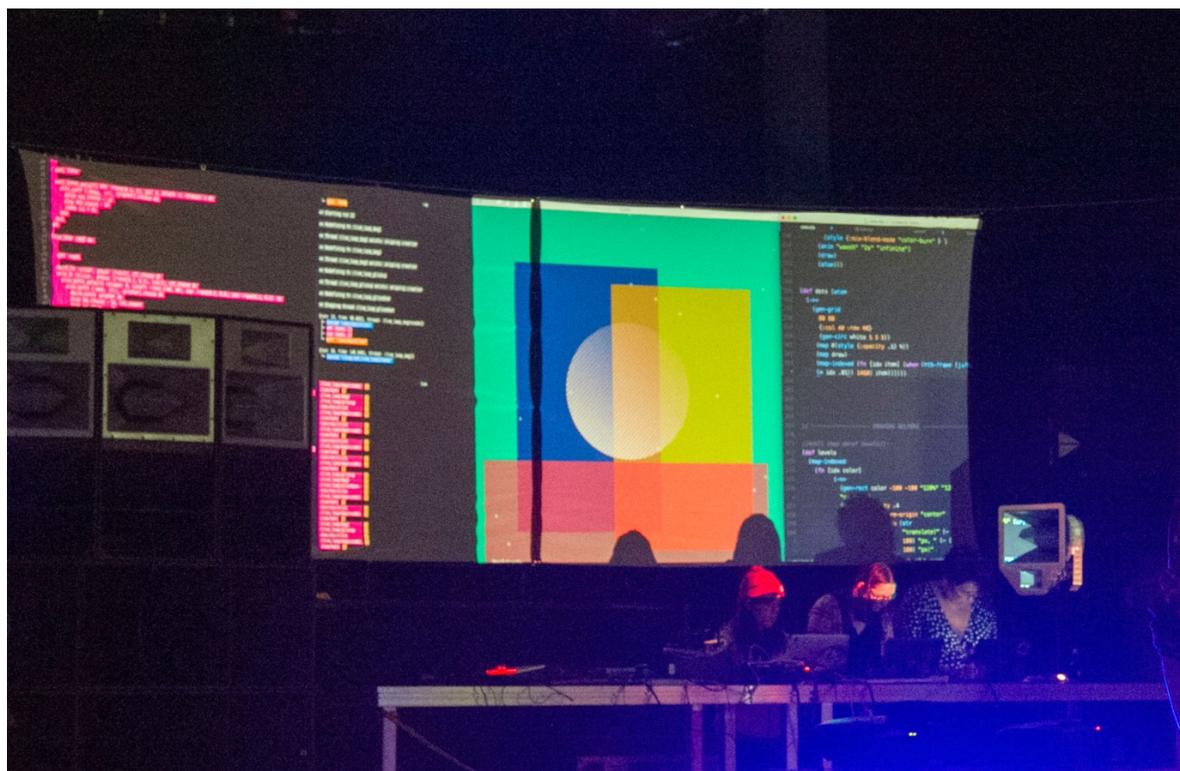
Figure 1: Codie in performance at the International Conference of Live Coding, February 2019, Madrid Spain

RHYTHMANALYSIS

In *Rhythmanalysis,* Lefebrve examines rhythm as an organizing principle for both apprehending and comprehending social and theoretical relations across experiences, be they the ebb and flow of crowds around the Centre Pompidou; the relation of state and citizenry in Mediterranean cities; or Foucauldian social discipline.

Regardless of critical target, rhythms are characterized through the health and interference manifested in their relationships to one another. The *polyrhythmic* are those that live alongside one another, unconnected but not interfering. This may be seen in the rhythms of a garden, where small cycles — time of day, life and death of a flower — exist alongside the cycles of the year or of a tree coming to life in the spring and going dormant in the autumn. The *arrhythmic* are polyrhythmic relations that become pathological, whereas *eurhythmic* relations are the reverse, in which the interaction becomes constructive.

Rhythms may also be characterized as cyclical or linear. The latter are mechanical, repetitive, in which each beat or action is nearly identical, whereas the former are organic and looser, with long intervals. (30) The distinction might be made by comparing tides to a dripping faucet. (75)

Lefebvre notes their interactions are more complex than expected:

> The relations of the cyclical and the linear — interactions, interferences, domination of one over the other, or the rebellion of one against the other — are not simple: there is between them an antagonistic unity. They penetrate one another, but in an interminable struggle: sometimes compromise, sometimes disruption. However, there is between them an indissoluble unity: the repetitive tick-tock of the clock measures the style of hours and days, and vice versa. (76)

Finally, rhythmanalysis describes relationships in terms of triads that are not traditional dialectic resolutions (*thesis – antithesis – synthesis*), but rather unresolvable balances between terms, each buoying and undermining the others in turn. These might be *past – present – future, possible – probable – impossible,* or even *melody – harmony – rhythm*. (11)

Describing the framework, Lefebvre notes, "The analysis does not isolate an object, or a subject, or a relation. It seeks to grasp a moving but determinate complexity (determination not including determinism)." These can still

be apprehended: "[T]o grasp a rhythm it is necessary to have been *grasped* by it; one must *let oneself go,* give oneself over, abandon oneself to its duration" (27)

Live performance creates an ideal venue in which to explore rhythm, by creating a situation in which the audience is urged to abandon themselves to the performance; live code performance brings the relationship of rhythms to the fore by linking the visual and aural through eurhythmia.

This primary rhythmic relationship is echoed and supported through the constituent rhythms of the music and visuals themselves.

As a new media practice, live code investigates the triad *knowledge – information – manipulation*. Through our knowledge of machines and algorithms, we the performers are able to manipulate information in order to create the sights and sounds that constitute the performance. By doing this in plain sight, we provide the information for our audience to enrich their knowledge, but manipulate the knowledge by working in particular paradigms.

CODIE IN PERFORMANCE

Codie is a trio made up of Sarah Groff Hennigh-Palermo, Melody Loveless and Kate Sicchio who program visuals and sounds to create an audio-visual performance experience. Sarah creates her ocular compositions of color and shapes in La Habra, a Clojurescript tool she built for live coding. Melody and Kate use the Ruby-based sound environment Sonic Pi. Their work not only draws attention to different approaches to live coding collaborations, but also highlights how rhythm plays a key role in the creation of these performance works.

Their approach is to create an overall composition of both animations and music improvised live that does not prioritize creating systems that seek ways to synchronize visuals and sound, like sending cues using OSC messages or implementing automatic audio reactivity like FFT analysis. Instead they focus on simply beginning the performances with a frame counter aligned with the BPM of the music and coordinate the beginning and ending of their performances at the same time. This methodology relies less on the deliberate synchronicity of moments and favors relationships.

When both the visuals and sound use these values, aesthetically, the output is a strong rhythmic counterpoint between the sound and visuals. As Lefebvre states, "It requires equally attentive eyes and ears, a head and a memory and a heart. A memory? Yes, in order to grasp this present otherwise than in an instantaneous moment, to restore it in its moments, in the movement of diverse rhythms." (36) To understand complex rhythms that are emerging as layers across both audio and visual, one must store the moment of these emerging patterns while the performance is unfurling. While code is changed and deleted, the audience maintains a memory of what went before, reversing the classic memory images of forgetful human mind and all-knowing machine.

In constructing complex rhythmic relationships, Codie creates aesthetics that are layered, embracing mess and disorder. In the Lefebvrian context these are eurhythmic relations: interactions between audio samples and synths, and visual shapes and colors generate complex rhythmic structures that are more than the sum of their constituents. Within a Codie performance, audio samples start with simple beats, looping and adding and building. The visual also finds its way from simple patterns to more textured, layered and animated sequences. From here some sounds and images simultaneously cue and inspire one another. Interwoven compositions emerge in real-time through looping code. Moments fold together. Contrasting patterns explore the arrhythmic and polyrhythmic, pulling and pushing with amounts of information being presented changing with the rhythmic structures.

SUMMARY

While there is much more to say about rhythm in the work of Codie and live coding in general, this paper begins to outline how Rhythmanalysis may be used as a framework for further understanding the alignment of the visual and audio in performance. Through a real-time process of *knowledge – information – manipulation,* rhythm is brought to the audience to see, hear, and remember.

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