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An analysis on the process of creating live Electronic Music

"Bringing composition and live performance together in modern Electronic Music"

Declaration

I hereby declare that I wrote this written assignment / essay / dissertation on my own and without the use of any other than the cited sources and tools and all explanations that I copied directly or in their sense are marked as such, as well as that the dissertation has not yet been handed in neither in this nor in equal form at any other official commission.

Abstract

This paper is aimed to analyse the modern process of composing electronic music in real time, while performing it. The psychological decisions beyond the instruments choice, freedom of expression compared to a composed path to follow. The once upon a time called the futurists, noise artists, avant-garde, musique concrète or simply robots, have taken their studio to front stage, the audience awaits to hear the transformation of a given moment into sonic energy, capable to morph it self simply depending on human feelings and the surrounding space that can influence such process.

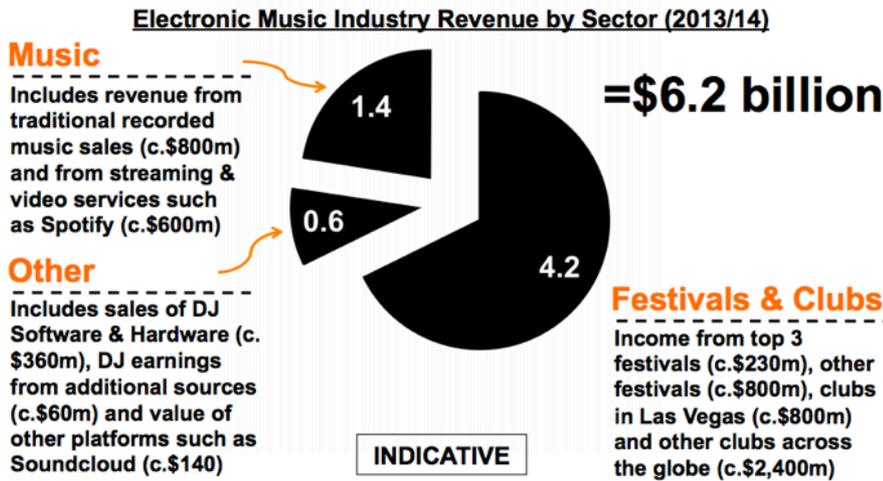
What's really happening in the modern days of electronic music production? Analog and digital technologies seems to no longer be considered as enemies among electronic production techniques but rather the perfect match responsible for an ever growing generation of composers aka performers. Pre planned or not written yet, live electronic music is a tangible culture that has generated a huge chain of events and an enormous amount of new music being created, recorded, shared and played across the globe.

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Introduction

In the past 10 years there has been a growing interest in live electronic music. In this day and age, there is an ever growing and faster development of technology in society and electronic dance music and these types of music have taken a centre stage role within the audio industry. The electronic music industry is a business estimated to be worth \$ 6.2 billion (Billboard, 2014 web) and is growing as we speak, and it is definitely worth researching.



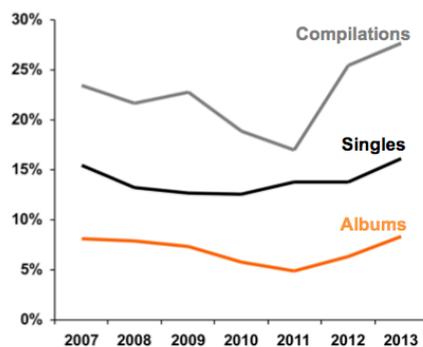
- For the second year in a row, Dance was the highest growing genre in terms of tracks sold
- Dance's share of both digital tracks (5%) and albums (3%) also improved for the third consecutive year
- In 2014, the Grammy awards for best album & record went to a dance act for the first time ever (Daft Punk)



(Billboard 2014)

Dance's share of single, album & compilation sales in the UK reached a 7 year high in 2013

Dance Music Share of Sales by Format (UK)

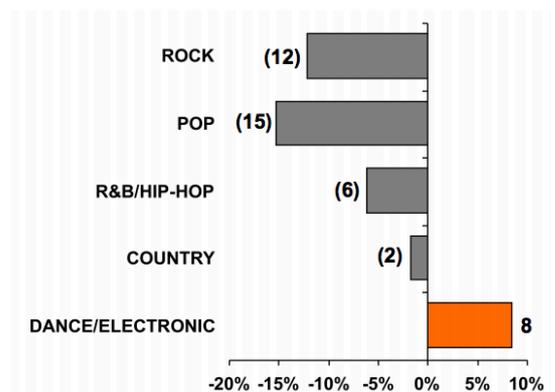


- Dance music share of all formats grew strongly in 2013 versus 2012
- The genre is now back to, and in some cases exceeding, the levels reached in 2005/06
- 12 of the 100 top selling albums were Dance in 2013 (vs 5 in 2012)
- These included releases from Rudimental, Calvin Harris & Disclosure



(Billboard 2014)

USA Digital Track Sales by Genre (YoY % Change 2013)



Not everyone agrees that this money making machine will do any long term good to the industry, but it is clear that it has caused a widespread chain of events and reaction in the audio industry to what was once know as "...a very elite thing to do...because it was expensive..."(Henke,2014). This commercialisation has also created a need for lots of artists to go back to the drawing board, rethink how they can optimize the use of modern technologies to focus more on human feelings, interactions and most importantly as Holden (2014) likes to describe it "...this abstract concept of the music."

The notion of composing while performing has become the centre focus for artists, equipment manufacturers and the music scene itself across the globe. The psychological interest beyond the content development and the choice of instruments that exhibit advanced performing features and the human interaction with them, has become a functional and reliable alternative; and in some cases, a business strategy to follow in the electronic music production world.

The emotionally pleasing reaction felt by listening to true and tangible live music for the first time, not to an edited and transformed reproduction of it (Neve, 2013), seems to be the reason behind this choice. Looking at today's generation; a generation that now concentrates on boosting its creative skills using touch technologies wired into vintage analog gear, affordable hardware or software instruments as an everyday formality, Henke (2014) also agrees that "...It is a new generation whom grow up with Ableton live, for them is completely normal that things work like this."

The pioneers of electronic music, from Futurist's Luigi Russolo to avant-garde artists of the past such as John Cage (Cox and Warner, 2004 p.170), Pierre Schaeffer (Cox and Warner, 2004 p. 76) and Stockhausen (1972), have always promoted and considered it a true form of art to be able to perform live music using electronics. They layered the foundations and beliefs for a new waves of artists, technologies and most importantly pushed new generations to "conquer the infinite variety of noise-sounds" (Russolo in Cox and Warner, 2004 p. 11). What once was only a credo, a manifesto, an art of few cultured visionaries, electronic live music has become a reality. The number of electronic music artists is growing day by day, bringing their studio to front stage and injecting the live experience in their recording processes (Cavalera, 2014).

From the days of being limited by dysfunctional young technology, where "only the simplest synthesis methods such as FM can be implemented in real time "(More, 1988 p. 25-26); to the utopia of the computer replacing real instruments with the first software synthesizer (Smith, 1994); to a modern and futuristic way of composing while performing, like jamming with a live band, as James Holden supports (Holden, 2014). It is not only about how the reproduced music has been achieved, but also a dialog of human feelings, how they are best translated into musical ideas and the freedom of

performing a composition live “continuing out of earshot” (Eno in Cox and Warner, 2004 p. 231), endlessly. Being able to compose while performing has changed the formative process of electronic music production. The creativity and power of instant expression tends to prevail over theories of preassigned structures that followed. What once used to be written first then performed later, live electronic music has made it possible to become one practical flow of ideas.

For the purpose of making this analysis current and based on actual facts, four artists (*Robert Henke, Igoor Cavelera, James Holden and Tiger&Woods*) have been interviewed, all of whom have a wide range of experiences, from 15 to 35 years, across different areas of the Audio industry - musician, producer, performer, software engineer, lecturer and former SAE London students (Valerio Del Prete aka Tiger&Woods). All have different music backgrounds but share one main aspect in their process of electronic music production, composing while performing.

A brief history of Electronic Music composition

Since Dot D'Alcorn, the invention of the Theremin and Clara Rockmore, the past century has been an amazing period for the advance of new technologies and the importance of interacting with them musically. The modern era has a limitless number of choices to express the creative self and the way learning information can be accessed. The result is a wide choice of artists and a huge showcase of different ways of live performed compositions “a dialog between the audience, my tools, the space and me.” (Henke, 2014).

Luigi Russolo, introduced the *Noise Instruments-Intona Rumore*, (Russolo in Cox and Warner, 2004 p. 11) during a series of concerts in London, one year after writing *The Art of Noises: Futurist Manifesto*. Cox and Warner (2004, p 25) commented that it is “...among the most important and influential texts in the 20th century musical aesthetics...”. Russolo (1913), an Italian painter and member of the Futurist movement, urged composers to explore and enhance the field of sound. Those words have resonated for the past hundred years and continue to do so, inspiring a huge number of musicians, composers and performing artists. John Cage’s *Imaginary Land Scape No.1* (Cage, 1939) is a proven example of a performed composition using turntables and live electronics. His work represents the evolution of Russolo’s invitation to break out from the conventional musical forms of that period. Cage prediction states, “The present methods of writing music, principally those which employ harmony and its reference to particular steps in the field of sound, will be inadequate for the composer, who will be faced with the entire field of sound” (Cage in Cox and Warner, 2004 p. 11).

Electronic music compositional techniques can be traced from a broad range of musical styles. A few examples of these that provide the foundations for keeping the human aspect as the centre point of

the performance are Indian and Western Classical , Avant-garde, Musique Concrète (Schaeffer in Cox and Warner, 2004 p. 76), Free Jazz (Coleman in Cox and Warner, 2004 p. 253) syncopation and cross rhythms. Electronics and computer technologies are just another medium used to translate feelings into music, and when it comes to a live performance the human interaction remains the same (Cavalera, 2014).

In the early 50s, musicians started to be influenced by books that highlighted the process of forming, paying closer attention to the reduction of elements, or as Stockhausen (1972) stated “the crystallized result of the creative act”. Scientists, biologists and, therefore, artists shifted their concentration to the form itself and the process of creation became the focus that somehow influenced music making from then on. During an inspiring lecture at the ICA in London in 1972, Stockhausen explains the connections between his music and the early 50s scientific findings, quoting biologists and scientists and how they have affected his composition process, “...the things are not in the time, but the time occurs in the things...It is very important...” (Stockhausen, 1972). Inspired by such historical events, cultural changes in society and new musical experimentation like the San Francisco Tape Music Centre (*I Dream of Wires*, 2013), there was a need to analyse the process of timbres, such as the piano or the clarinet and to be able to go from macro to micro and vice versa using sound synthesis, eventually leading electronic music into an experimental and disciplined musical practice (Reich in Cox and Warner, 2004 p. 304).

The invention of the *Buchla* (1963) and *Moog* (1964) modular synthesizers divided electronic music composition into two different directions - the keyboard-western scale musical oriented side and the experimental alternative approach, as Subotnick states “not sounding like the music as we know it” (*I Dream of Wires*, 2013). Walter-Wendy Carlos - *Switched on Bach*, an electronic music composition performed on a Moog modular, took the audience by storm when it was released in 1968, becoming the first classical album to sell 500,000 copies going on to win three Grammys in 1969 (*I Dream of Wires*, 2013). One year before this, Subotnick released *Silvers Apple of the Moon* (1967), an electronic performed composition made with a sequencer triggering a synthesizer. Subotnick himself recalls the impact that W. Carlos' record had on the audience and points out the main difference between performing a composition via the conventional keyboard using one volt per octave, and the sequencer which uses smooth voltage transitions “...loop is metrical, sequence is potentially forever, together is dynamite.” (*I Dream of Wires*, 2013).

The German band Kraftwerk were one of the pioneers when it comes to composing and performing live electronic music. They would have endless live rehearsal sessions before embarking on world tours, using elite technologies of that period such as Arp, Moog, Hammond

B3 and, as Flür (2004, p.51) recalls “the beginning of our striving towards technical innovation”, a self made electronic drum kit, using components from an organ drum box.

Those early live performed musical compositions have influenced a huge range of musical styles and technologies, such as Hip Hop, Techno, Pop music and many more modern and future forms of electronic composition. Those early compositions also had a huge impact on people, such as Dave Smith, father of the early idea of MIDI (RDMA Tokyo, 2014) and Electro funk creator Afrika Bambaataa who remembers “...when I heard Trans Europe Express I realised where the electro funk would come from...” (Vaughanography, 1982). No matter what technology is been used, it will be “...always very important that the creation of electronic music is something that can be done in real time, in a very intuitive way...this is way we decided that a software like Ableton Live is necessary.” (Henke, 2014).

Actions and construction, how we define our decisions.

Inspiration can come from anywhere when approaching the initial step of composing a piece of art, in this case a performed musical composition. Artists are inspired from everyday life itself. A new experience creates new synaptic connections within the central nervous system (Schwartz, M.D., Begley 2002, p. 179). Cavalera (2014) recalls a visual experience, “I remember way back in the early 90’s, I saw some trance Dj sets...” which triggered ideas for his new project. Anything we witness could trigger new ideas and musical paths to follow in order to start constructing new ways to express a form of dialog, a common language and music.

The building blocks to start planning a live performed composition could be as simply as drawing a little plan using the old pen and paper (Del Prete, 2014). The choice of composing live during the performance has always been available to anyone. It is, of course, not an option that everyone feels conformable with, feeling vulnerable or in a risky position on stage or in studio could be something that artists do not want to experience, however that is usually the reason that causes the magic to happen “...I think thats the most important thing” (Holden, 2014).

In the past, economical reasons also affected our actions in setting up a live studio or a rehearsal space. Analog oscillators were priced at \$400 in the mid 1950s “...the equivalent of today’s \$5000 for one oscillator...” (Subotnik in I Dream of Wires, 2014). Traveling to a gig with all the equipment needed to perform, or simply buying a synthesizer was as, “...expensive as a new Volkswagen car...” for Flür (2004, p.51). This could have limited the decision of starting the electronic music production journey or to take it as seriously as learning a classical instrument such as the acoustic guitar.

The pioneers of the genre have layered the foundation for a beautiful sounding, visually pleasing and affordable reality. Hardware, software, wired, modular, wireless and over the world wide web, today's options are infinite and worth discussing. From a £30 delay pedal to a free youtube app capable of stretching the audio content of a video in real time, "...creating electronic music is something that everyone can do..." (Henke, 2014).

The excuses for not considering composition and performing as one process in today's Electronic music are obsolete. It would mean avoiding and alienating people from learning a solid culture of electronic live music performance, artists and techniques that go back more than a century. It is not "...a PA or something...watch a wave file playing for 60 minutes" (Holden, 2014) but a "...distinctive sound ...a sort of trademark..." (Del Prete, 2014). Today's fast and furious ways to access information, e.g. social networks such as Facebook, Twitter and online resources, can sometime cause a negative side effect in modern society. Misleading and false statements can leave the audience to believe in a non-existent reality and therefore cause confusion while trying to define decisions in the electronic music production process.

The aim to construct a realtime work environment, therefore compose live electronic music while performing, is also driven by the willingness to expose "...people (to) what we usually do in our studio..." as Del Prete (2014) explains. Experimenting with sound design, modular evolving monotonous or harmonically rich textures can be driven by the idea of being able to produce a piece of music that "...every time I perform I get a different idea on what my music is about and what are the interesting things. I try to develop my tools in such a way that I can express this concept better" (Henke, 2014).

The choice of equipment, as human as possible

The preproduction process

The first step would be "...put together the right machines" (Del Prete, 2014). A session not planned is a session planned to fail, therefore choosing the right tool for the right job, whatever feels comfortable and appropriate can lead to a successful, and most importantly, a constructive outcome. The learning resources available in order to approach the concept of electronic music production/performance are endless. From award-winning books such as *Capturing Sound: How Technology Has Changed Music* (2010), online courses tailored to specific topics, full time and part time education such as *SAE Institute BA/Hons-EMP*, to simply watching *I Dream of Wires* (2014), "...regardless if they live in China, Europe where ever." (Henke, 2014).

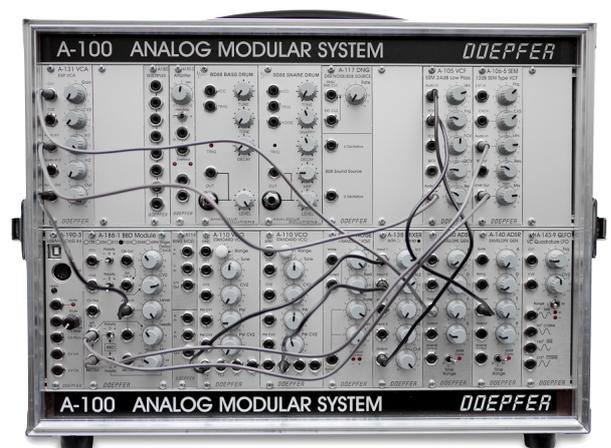
Once that the basics of *Music Technology* have been researched and evaluated, the choice of the equipment to base the practice is subjective, keeping the focus on "T.T.H. turn till happy" (I Dream of Wires 2013), the human interaction with the instruments. We are witnessing an increased number of new equipment being released regularly by big corporate companies such as Korg and exciting new companies such as Pittsburgh Modular and Teenage Engineering to name a few "...all aimed to have an heavily live usage..." Del Prete (2014). The aim is clear, they all require a performance during the composition process, e.g. rather than choose a software instrument that would load and play pre-made drum patterns, going for a midi controller that requires a human to "...play some live drums...It would add more to the music..." as Cavalera (2014) explains.

The Laptop has become an instrument in its own right as evidenced by Palms Trax (2014) a talented young producer with a basic understanding of electronic music production, a laptop and a very prolific live tour, who reminds us that "...what we need is more emphasis on staying focused on your own ear...". The most expensive piece of software or hardware will not produce a piece of music capable to express human emotions on its own, for Henke (2014) "...It is important that I move several faders at the same time to get the right gesture and if i would need to draw those things, I would never do it.".

Below are few examples of different set ups available on the market and artists' live set up :

1) **Modular Synthesizer system:**

- Live composition and performance.
- Human interaction required.
- No hardwired signal path.
- Outcome different at all time.
- No presets/saving options.
- Entry level, cheaper than a Macbook Pro Computer.
- Infinite expandable options (Eurorack/CV).
- Requires a recording medium.



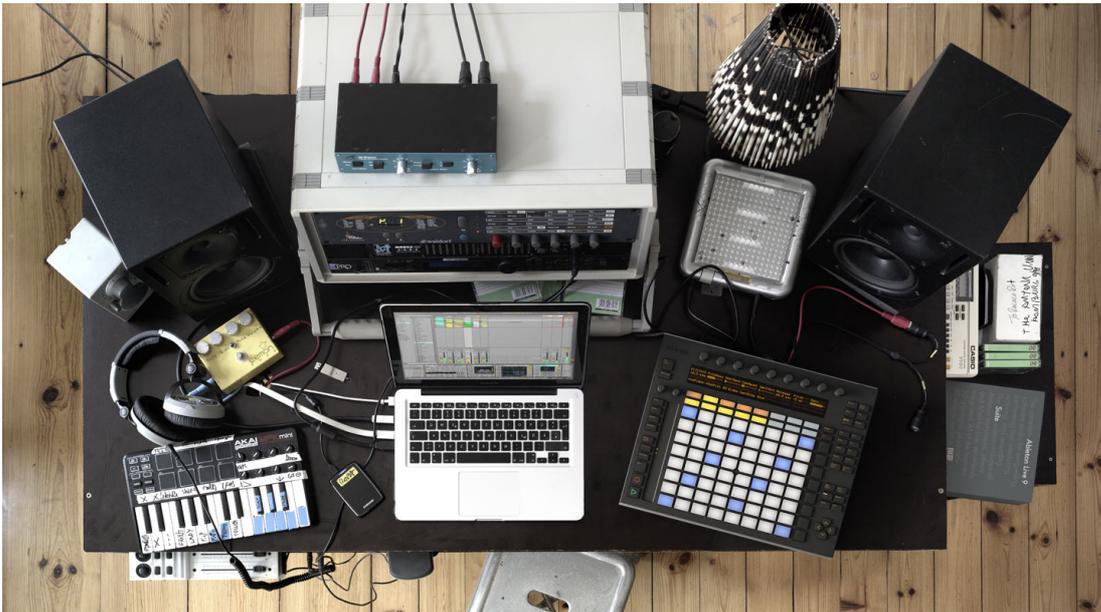
(doepfer.de, 2014)



(pittsburghmodular.com, 2014)

2) Computer(laptop/desktop) and Hardware instruments (Midi controllers, Analog and Digital)

- Live composition and performance.
- Human interaction required.
- Hardwired signal path.
- Different outcome at all time.
- Presets saving options.
- Expandable (Hardware/Software).
- The computer can also be uses as the recording medium.



(Ableton.com, 2014)

3) Del Prete Valerio aka Tiger & Woods live set up (Hardware/Software)

Artist's summary;

"We are two geeks basically. We always looking for the next perfect tool for our live show which changed a lot during the years.

We started with two MPC1000, NI Maschine, DSI Mopho and an Ableton live session controlled by a laptop and an iPad. Through the years it changed a lot. The routing of the live show is pretty complex and we're using every single audio path of the Mackie VLZ1604 mixer that we ask to rent for us by the venue...

..We are using all the 16ch of the mixer (coming out from the sound card with multiple outputs plus all the other instruments), this setup leave us enough room to improvise (the Octatracks allow us to live sampling, editing and mangling) and be tight at the same time . Everything is synched using a Midi Solutions Quadra Trough, which is a midi signal splitter that also clear and fix the midi signal. The role of NI Maschine is a Drum Machine, actually multiple Drum Machines. We loaded it with our favorite drum machines (DMX, Linn Drum, 707, 808, 909 and 727), to play and improvise all the rhythmical sections... " (Del Prete, 2014).

- 1 NI Maschine.
- 1 DSI Mopho.
- 1 Ableton Live session.
- 1 Launchpad.
- 1 RME Fireface400.
- 2 Elektron Octatrack.
- 2 Joemeek MC2 Compressor.
- 1 Reloop Terminal 4 Dj Console.
- 1 Midi Solution Quadra Trough.



(Decibel Festival 2014)

4) James Holden live set up (Example 1 and 2 combined /Modular/Software/ Live drums)

Artist's summary;

"The way I have my modular with my computer set up is quite a flexible instrument. I can make them do lots of different things...Me and Tom Page (drummer) who's such good improviser...We are a bit in tune with each other, we have a sort of language of signals and little musical gestures we both recognize each other and it just happens. I actually love it, really. It's the most exciting thing." (Holden, 2014)

- *Ableton Live.*
- *Modular system.*
- *Live musicians.*



(James Holden, Red Bull Music Radio, 2014)



(James Holden live at the Barbican, 2013)

5) Robert Henke, Lumière live set up (Hardware/Software/ Visuals)

Artist's summary;

"...It depends, for the lasers project I needed a big space to rehearse, similar to the actual live show. The lasers are too bright and exhausting in a small space. Also I cannot work with different lasers for the one used in the actual live show because they would behave differently, so for things specific show I need a big space...(Henke, 2014)".

Audio Laptop Software:

- (1) Ableton Live 9 with the following self built MaxForLive devices:
- (2) 1 M4L device managing the communication with the laser computers and turning MIDI Notes into drawing commands.
- (3) 3 M4L devices creating sounds in sync with the drawing commands received from (2).
- (4) A Max Standalone for connecting various MIDI controllers to Live.

Audio Laptop Hardware:

- (5) 2 Doepfer MIDI faders for controlling aspects of sound generation and manipulation and a few parameters of the laser drawing.
- (6) 1 Custom made LIVID Controller for controlling some real time variations of the laser drawing and acting as a Mixing surface for the audio signals.
- (7) a Motu Ultralite audio interface sending audio signals to the PA and acting as a MIDI interface for the Doepfer MIDI fader.

Laser Laptops:

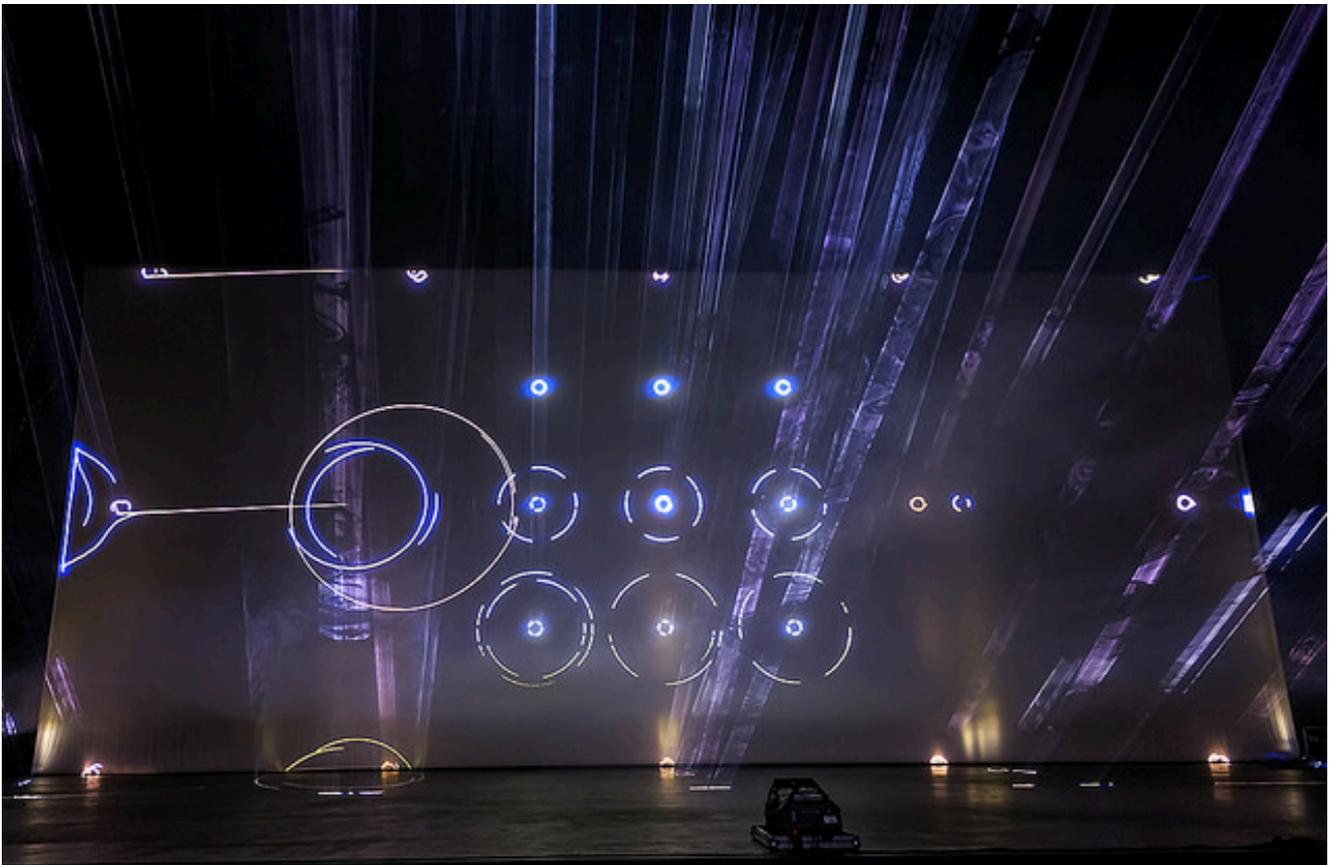
- There are two laptops necessary to drive the lasers. Each laptop has the same setup.
- (8) A self written Max patch that transforms the laser drawing commands from (2) into control signals for the lasers.
- (9) A Motu Ultralite interface, here acting as a digital to analog converter for the laser control signals.
- All computers are connected using UDP via Ethernet via a ethernet switch.

Lasers:

- 3,4, or 6 LaserAnimation Sollinger Blizzard 8000 projectors.



(Robert Henke, Web 2013)



(Robert Henke Lumière live at Zuiderstrand theater, 2013)



(Robert Henke, Web 2013)

Preparation and improvisation

As explained in the *A brief history of Electronic Music composition* (page 2), there is no right and wrong way in Electronic music, as Holden (2014) describes “...It is sort of like a chicken and egg thing, I do not know which come first. It is about a dynamic, sort of a narrative that can change and can be different...”. Whether it is based on an classical musician approach or an avant-garde experimentation, it does not matter. Composing while performing does not restrict the freedom to express creativity into fixed arrangement rules or an ancient *Pythagoras* mathematical formula (Fauvel, Flood, Wilson, 2003 p. 24) but expands it into new forms and completely unexpected structures.

The finished material could be the result of “...finished pieces...then I tried to find a way to put them back to a modular state that I can actually perform them” (Henke (2014), or improvised performed compositions that are edited to a standard structure, “...all my music was made live... in the studio and then cut together.. long live takes of my modular...” (Holden (2014). Keeping the right balance of the two is a choice and relates to the skill of the composer aka performer. Del Prete (2014) divides the process into two parts, “ usually..the first part...we stick to the arrangement we rehearsed in studio and we leave the second part to improvisation...”.

New techniques and live coding using programming environments such as *Max/MSP* (Cycling74, 1997) *Tidal* (Mclean, 2009) and *Extempore* (Sorensen, 2013) to name just a few, are capable of real time performance and composition and strongly influencing the future of electronic

music. Live coding is pushing the boundaries of live music and visual arts, where the laptop is the main and only instrument and the “music you are about to hear is not yet written” (Sorensen, 2013). Preparation and improvisation are the central narrative when it comes to composing and performing a new piece of music, with both techniques going hand-in-hand in today’s industry and among artists. From analog modular synthesizers patched into *Ableton Live*, to live coding that requires instructions to be written and executed in real time, improvisation is “...the essence of communicating musically” as Dark Side likes to say (Dark Side in Creighton, 2014).

```
(play chipsquare pitch 80 dur 1000)
(callback (*metro* (+ beat (* .5 dur))) 'l2 (+ beat dur) dur
  (if (> pitch 48)
    (pc:relative pitch -1 (pc:scale 0 'ionian)
      60))))

(l2 (*metro* 'get-beat 4) 1 60)
(l2 (*metro* 'get-beat 4) 1/3 67)

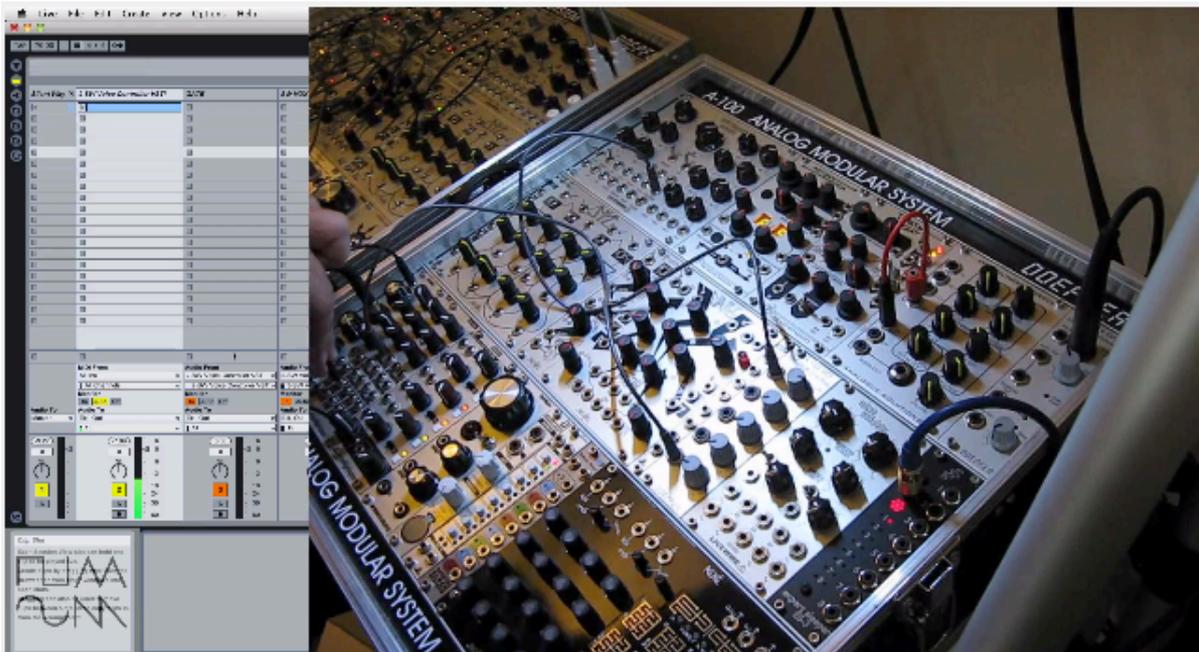
(define chipdrums
  (lambda (beat dur)
    (if (= (modulo beat 2) 0)
      (play chipsquare 30 110 dur))
    (if (= (modulo beat 2) 1)
      (play chipnoise 110 (cosr 120 10 1/2) dur))
    (if (< (modulo beat 8) 4)
      (play chipnoise 110 (cosr 120 10 1/2) dur))
    (callback (*metro* (+ beat (* .5 dur))) 'chipdrums (+ beat dur) dur)))

(chipdrums (*metro* 'get-beat 4) 1/4)

(bind-func chipnoise_note_c
  (lambda (nargs:i64 dargs:double*)
    (let ((bpfl (bpf_c))
          (bpfr (bpf_c)))
      (lambda (time:double chan:double freq:double amp:double)
        (cond ((= chan 0.0)
              (bpfl (* amp (random)) freq 0.5))
              (t (bpfr (* amp (random)) freq 0.5)))))))

*extempore* > Extempore
Compiled chipnoise_fx >>> [[double,double,double,double,double]*
Compiled chipnoise >>> [[double,double,double,double,double]*
Compiler Error: unbound symbol: chipnoise
Compiled dsp >>> [[double,double,double,double,double]*
Compiler Error: bad arity for (bpf_c) (time:double) 0.5000000000000000
Compiled chipnoise_note_c >>> [[double,double,double,double,double]*,i64,double*]
*extempore* > Shell:run
```

(Live coding with Extempore, 2013)



(Controlling a Modular synth with Ableton Live, 2011)

Composing while performing: The flow of the past, present and future in real time

“Most enjoyable activities are not natural; they demand an effort that initially one is reluctant to make. But once the interaction starts to provide feedback to the person's skills, it usually begins to be intrinsically rewarding.” (Csikszentmihalyi, 1991)

Many times during a live session, playing a pre-prepared project from the computer, while improvising few notes on a keyboard or simply modifying a VCO with a VCF, most likely we will hear someone saying something like “...woo that beat you did in that song was great...nice...” (Holden, 2014). The resulting action of playing an instrument, something that requires human interaction capable of generating feedback, immerses the player into the exploratory and creative stages of composition. When it comes to electronic music production, often the term *workflow* is used to describe the process of making the music from initiation to completion. Taking away the word work, *flow* in reality should be the only thing to focus on during the session. The word flow has been extended to a psychological concept, that is “...proposed to be a state of effortless attention, which arises through an interaction between positive affect and high attention.” (de Mazano *et al*, 2010 p.1).

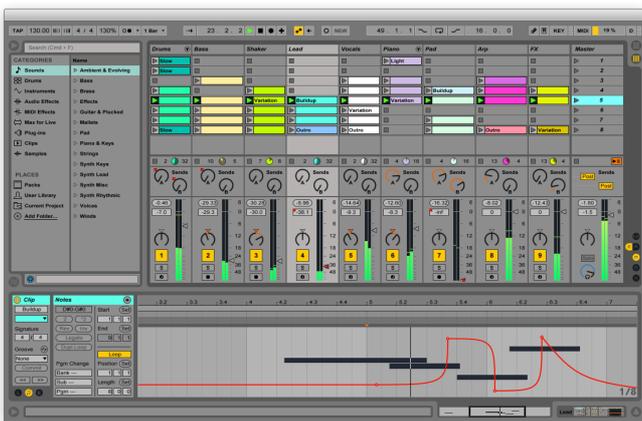
Composing while performing is more than just a modern way of creating live electronic music, it is a great practical approach that enables creative flow. This flow connects the performers psychologically and physically, whom desire to hear a sound instantly and be able to modify it in real time. Since the inception of his company *Sequential Circuits*, instrument designer Dave Smith always supported this point. The instant feedback is evident in all the analog and digital synthesizer instruments Smith has designed. In a recent lecture at the *Red Bull Academy in Tokyo*, he reminds the world of the importance of real time interaction. He was the first to design a software synthesizer for *Intel* in 1994 and the first to abandon the market of software synths in order to return to hardware instruments with the release of the *Evolver*, in 2002 (Smith, 2014).

The activity involved in learning to play an actual instrument can have a long term positive psychological effect. Neuroscientists recently observed monitoring musician's brain activity using *Functional Magnetic Resonance Imaging* (fMRI) and *Positron Emission Tomography* (PET) scanners. The imaging process reveals that playing a musical instrument activates multiple area of the brain simultaneously, “...that activity becomes more like a full-body brain workout.” (Collins, 2014). In the case of live electronic music there is an increasing diversity of instruments to choose to learn from. It could range from hardware synths, *Ableton Push*, modular systems or with the *Tiger & Woods* example, multiple instruments at once. To be able to compose while performing the musician

commits to play and practice with the instrument(s). Such discipline has become an every day routine and a growing number of musicians are developing novel ways of using, combining and collaborating with them.

Ableton CEO Gerhard Behles in his recent interview for *Highsnobiety*, exposes the infinite possibilities of Ableton's revolutionary *Session Page*. He cites that its limitless ways to compose a piece of music enable experimentation whilst performing, and mentions a particular factor that lead the company to collaborate with hardware manufacture AKAI, first with the *APC* and then with *PUSH*:

"It was one guy that felt really strongly about this idea...APC, which stands for Ableton Performance Controller...being able to make a song without looking at your screen...the notion of now and the absence of a song that simply begins and ends." (Behles in Cardiner, 2014)



(Ableton.com, 2014)



(Ableton.com, 2014)

Past, present and future, the importance of interaction with instruments remains the centre narrative of composing while performing. Bob Moog evidences this in the past in the way that he used to gather feedback from musicians to be able to master his *MOOG* signature brand in the mid 60s (I dream of Wires, 2013). London based start-up company *ROLI*'s vision for interaction is the basis of their multi-award winning *Seaboard GRAND* instruments. *ROLI* R&D Engineer Jack Armitage points out the *Seaboard*'s composition and performance features:

"The Seaboard GRAND exhibits an emphasis on maximizing creative control during performance, which I think is extremely important for a musical instrument. It concentrates your attention towards the richness of human touch, and in doing so empowers players to explore complex sounds in an immediate and intuitive way." (Armitage, 2014).



(Seaboard, Roli.com 2014)

Artists, manufacturers and the audio industry share these principles in the different ways in which they participate in live electronic music performance. Composing while performing has become a process to be taken seriously when it comes to recording a piece of electronic music "...it would make lots of sense [to make] this concept the ultimate recording situation" (Henke, 2014). A psychological need, a state of effortless attention is the process that opens up a world of possibilities not only for the audio recording sector to benefit from, but also for all arts educational sector in general, new businesses and the future generations to come.

The idea of a long and exhausting process of endless programming and editing sessions required to complete an electronic production is unrealistic, especially when the current scenario of production welcomes great musicians, like drummers, to join the electronic live concept. Of course there has been some dissent on the topic showing less appreciation for musical knowledge and culture, as Henke (2014) recalls, "...school teachers told me that drum computers are evil...drummers will not find work anymore in the future."

It is the combination of artists, musicians and technologists that makes the overall result much more interesting for the audience that have come to experience a mind blowing live electronic music show. Holden (2014) points out that "I feel more like I have done something that was worth that [and] that I am playing *live*" (author's emphasis), which positively impacts the composition and performance of the resulting music.

In today's audio industry, where any kind of music, including classical, is electronically recorded and edited to perfection as Henke (2014) highlights, "it is common practice these days in classical music, that solo parts for classical music are edited like hell...performers are not happy with their take and they end up applying up to 20 edits". Composing while performing has become a natural reaction to any technology that tries to separate the feeling from the music. '*Perform more and edit less*' is something worth following; a practical process not only made of a mono or stereo output, but an approach that can lead to endless recording sessions, and as Holden envisions "the next kind of music I make [will] probably be recorded like a live band ...recording a live album or something" (Holden, 2014).

Conclusion

The aim of this analysis was to expose and explore the possibilities, benefits and other reasons beyond the process of composing whilst performing electronic music, live. For the past 20 years experience of buying music, DJing, producing and lecturing in electronic music, I have witnessed drastic changes of the process of producing electronic music. From being stuck for days trying to understand *Scream Trucker* (Tamimlehto, 1990) to traveling more than 100 miles to a show expecting to see my favorite DJ's production secrets, I have experienced both technological and logistical difficulties (this was in 1994) in developing my own understanding. The will to innovate from companies and instruments designers like *Dave Smith*, *Robert Henke/Ableton*, *Akai*, *Native Instrument*, *ROLI* and *Doepfer* has helped to reshape live electronic music and push the state-of-the-art of music culture as we know it today.

My curiosity also helped to research and interpret the changing needs of musicians by tracing the path of the same artists that 15 years ago disliked the idea of making music using hardware instruments, such as drum machines and synthesizers. Many who were once self-made software fanatics are now cutting edge experimental performing composers using a variety of digital and analog systems in tandem. The early works and philosophical analysis of artists such as Luigi Russolo, Karlheinz Stockhausen, Steve Reich and recent studies on flow and brain activities during musical performance have made the process of composing and performing music relevant and important to the contemporary world.

This invites pioneers to rediscover form itself (Stockhausen, 1971) and be unafraid of the music critic who, in vein, tries to relate art to something incomprehensible; the evolutionary phenomenon of music subgenres. The tempo of individual or multiple events, cross rhythms, instruments used, hardware or software is no longer relevant. What is relevant is what humans will create with them and how such processes can benefit our state of mind. That is the future of live electronic music.

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Appendix

CD :

Track 1 - Igor Cavalera interviewed by Francesco Redente.

Track 2 - James Holden interviewed by Blake Creighton for Francesco Redente.

Track 3 - Robert Henke interviewed by Francesco Redente.

Text file - Additional references and audio links used.

Interview :

Valerio Del Prete (Tiger & Woods) interviewed by Francesco Redente.

Actions and construction, how we define our decisions :

I have a DJ background and honestly I never thought about performing live till I started the Tiger & Woods project.

The reason why we decided to perform live rather than Djing is simply because the project has a very distinctive sound that became a sort of trademark for us among the people into our music, so we wanted to have a show focused on that specific sound and usually a dj set can lead somewhere else. People are coming to our show to listen to Tiger & Woods and we didn't want to disappoint them with something different and we realized that a Live Show is the best way to give them what they expect.

Once we decided to perform a live show, the first tools we used to conceive it were a pencil and a piece of paper.

This preliminary stage was pivotal to set the live show up: we had clear in mind what we wanted to do, but we needed to figure out how to do it, which machines were functional to our project and also the roles of each of us.

The more we got into the the preparation of the live show, the more we loved the idea of create a unique club gig experience, exposing to people what we usually do in our studio.

Preparation and improvisation, the pre-production process :

There are two distinctive phases in the pre-production process: the first one is put together the right machines and the second one is the actual preparation of the live show.

We decided since the first moment to leave a lot of space to improvisation (otherwise is not a live show, but that's my honest opinion), but we're not instrumentalist or incredible stage performers, so we had to find a good compromise.

We ended up having sort of "guidelines" throughout the live show and we can improvise around them.

To me it's really important to find a right balance between preparation and improvisation, cause total improvisation is not working as much as total preparation. Watching a guy who's doing nothing on stage is, to me, as boring as watching a guy who's totally improvising.

The best way to do a job we are proud of, was for us to have sort of zones: usually in the first part of the song we stick to the arrangement we rehearsed in studio and we leave the second part to improvisation.

The choice of equipment, as human as possible

We are two geeks basically. We always looking for the next "perfect" tool for our live show which changed a lot during the years.

We started with two MPC1000, NI Maschine, DSI Mopho and an Ableton live session controlled by a laptop and an iPad. Through the years it changed a lot, now we're bringing:

- 1 NI Maschine
- 1 DSI Mopho
- 1 Ableton Live session
- 1 Launchpad
- 1 RME Fireface400
- 2 Elektron Octatrack
- 2 Joemeek MC2 Compressor
- 1 Reloop Terminal 4 Dj Console.
- 1 Midi Solution Quadra Trough

Everything is placed and screwed in two custom made flight cases.

The routing of the live show is pretty complex and we're using every single audio path of the Mackie VLZ1604 mixer that we ask to rent for us by the venue.

We are using all the 16ch of the mixer (coming out from the sound card with multiple outputs plus all the other instruments).

All the tracks are going to the 4 sub groups having two pair of stereo out: one is going to the Joemeek MC2 comp and back in the mixer in two channels (this will be our new master), the second is going through one of the two Elektron Octatrack for resampling/mangling purposes.

At the same time we use one aux channel to control side chain with the second Joemeek MC2 comp: we feed the aux channel with the kick drum and this one will trigger our side chain on our "new master", the one coming out from the other comp.

Everything is synced using a Midi Solutions Quadra Trough, which is a midi signal splitter that also clear and fix the midi signal. The only not synced machine is the Reloop Terminal 4, a portable console we use to play original 80's boogie track that we live edit on the fly.

The role of NI Maschine is a Drum Machine, actually multiple Drum Machines. We loaded it with our favorite drum machines (DMX, Linn Drum, 707, 808, 909 and 727), to play and improvise all the rhythmical sections.

The last, but not the least, is the DSI Mopho: a little tiny analogue monophonic monster we use mainly for the bass getting the midi parts from ableton live (for the more "arranged" part) and played live from the other Octatrack (which can work as midi keyboard once it's in midi mode).

The second Octatrack is filled with audio parts we mangle and change every show.

As I was telling before this setup leave us enough room to improvise (the Octatracks allow us to live sampling, editing and mangling) and be tight at the same time.

Composing while performing, the flow of the past, present and future in real time :

Our Live Show can be considered more as an "advanced dj set" or even a sort of "Samplers ensemble". Again we need to rely on machines as we are not stage performers. I mean I can play piano, compose and everything, but doing it on a live environment is a completely different job. The music we do is basically edits and sampled based house and boogie, so we love to treat, edit and transform samples.

We wanted to keep this composing while performing feel to our live show, tho. The final result is that now we do a lot of live edits and live samples treating, which is something relatively new in live dance music (mainly thanks to new technologies: the idea of live sampling and live editing with no latency and keeping the music flow intact was science fiction even few years ago!).

This approach to our live show brought us to perform a different show every time keeping it tight with "sense" all the time.

How do you think that Electronic Live music has influenced/changed the Audio recording industry ?!

think Electronic Live music changed the Audio industry radically.

It's where electronic music is going more and more. It's something that can be easily spotted just checking the newest machines on the market, even just in the dj world environment. If you think about the amount of new controllers and small synths or drum machines that are coming out on a monthly basis and all of them are aiming to have an heavily live usage. All the Ekeptron products (Octatrack, analog 4 and analog rhythm), DSI Tempest, Maschine and other controllers, or even the latest korg volcano series are all the sign of the times, a time where the live usage is becoming one of the most important feature of a new product.

There is still a big chunk of the market for a more classical studio equipment, but the live aspect is gaining more and more space.