

THE COMPUTER MUSICIAN_



THE LAPTOP AS A PERFORMATIVE INSTRUMENT IN CONTEMPORARY MUSIC

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Composition

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INTRODUCTION _

This is a handbook about music and laptops. More specifically about my good old ‘hackintosh’ laptop and how i’ve been discovering a whole new world of creative and performative possibilities through this yet quite unacknowledged instrument.

Yes, it is possible to argue that laptops have been around in the musical scene for a long time now, within the vague category of ‘electronics’ or ‘live electronics’.¹ However, even though the laptop is potentially a very powerful instrument for the musical practice, I am yet to witness within conservatories a department that will specialize in laptop playing.² The scope and degree of specialization and exploration of the laptop I have in mind goes beyond what I have noticed in departments specialized in ‘electronics’, since these departments seem to teach the students how to master specific pieces of software (Logic, Max/MSP, SuperCollider when you get lucky) or hardware (Midi/Audio interfaces, Controllers, Effect generators) that in the end enhance the student’s main subject, be it an instrument, composition, or anything else. I firmly believe that the laptop

¹ According to S. Emmerson (Emmerson, 2007, p. 14) the term *electroacoustic* could embrace all ‘music heard through loudspeakers or sound made with the help of electronic means, including simple amplification’.

² Though some conservatories, Princeton and Stanford as the most known ones, have laptop orchestra projects: a large ensemble comprised only out of laptops and its performers.

specialization could be a main subject. In the following chapters I will aim to explain why the world of possibilities that a 'real' exploration of a laptop opens is much, much more than just 'mastering' the above-mentioned softwares/hardwares, and how actually a 'laptop performer' is the one who develops the skills to re-interpret, transform, hack, tweak and adapt this powerful amalgam of circuits, sensors, processors and inter-communications device that we call a laptop to fulfill any artistic (in this case musical) need.

Interestingly enough, it seems that the 'mastery' of the laptop I am looking for is developing outside of the academia. Mostly on community or internet culture. The laptop artists that I admire were not formed in a Conservatory but had to dig and find their own path after studies, thanks to their own effort and research but also thanks to the fact that access to information on how to get the most of your laptop is now of public domain through countless internet forums. We live in an era where we don't need to be experts in order to build electronic circuits, put together sensors, get into robotics, master the essence of radio transmission or even learn the basics of the latests street cultural movements. How does this relate to music though? For a creative composer and/or laptop performer who believes that music is more than just sound, these possibilities and this potential is mouth dripping, exciting, lovable, unlimited and mind blowing!

To talk about the computer musician, in the broadest sense, one must also take into consideration all the development within 'club music' and DJ culture, as well as the more experimental technical researchers that in a first glance have nothing to do with music. But

this handbook will focus on one very specific path of a computer musician, a path that I have been discovering through practical research and that has proven to have it's most impact within the music-theater genre.

Along the first chapters the reader will understand what is exactly what I refer to as a 'laptop', in a physical and a virtual sense, followed by an insight into why and how the laptop can be acknowledged as a musical instrument.

The definition and expansion of the term 'live electronics' will be developed in chapter 4, followed by 2 case studies of pieces and artists that I consider to be both innovative and creative in their use of 'electronics'.

From Chapter 6 onward the reader will understand the characteristics of a very personal way of approaching the laptop and 'live electronics', hopefully also understanding why I am so passionate about the artistic world that the laptop opens, and how all this discovered resources, the access to information and current cheap/ domestic technologies, are of huge motivation and encourage my creativity and artistry as nothing else for the last 2+ years.

Creativity, Innovation, usability, efficiency, technology, beauty: these are the driving forces of the computer musician. In the conclusive chapter this kind of musician will be understood under new light where the above mentioned words are to be clearly linked to the contents of the different chapters in this handbook.

I want to thank many people for encouraging me and supporting me in writing this project, and also for understanding me when dedicating most of my time to laptop research, so I have created a special 'acknowledgments' chapter at the end.

THE LAPTOP ITSELF_



Nowadays most of us own a laptop. Surveys from all around the world demonstrate that well above 50% of the households own at least one laptop or a desktop computer. If we include mobile devices (mini computers one could argue) then the number immediately rises, especially in countries such as The Netherlands. Even in developing countries, such as Mexico, personal computers and mobile devices seem to have exploited the consumer market, and it is almost unthinkable to follow studies without the aid of a personal computer. In short, laptops and personal computers are nowadays a

domestic appliance, such as the rotary telephone was some 50 years ago, where most of the households would own at least one.

What is surprising, however, is that this amalgam of circuits we call a laptop is not used at it's full customized potential in most of the cases, and we are even sometimes unaware of the basic components of our computer.

A better understanding of these components is important for the computer musician, because it will let us *customize* the technology to our very specific needs. This is of tremendous impact because we are for once utilizing the laptop's resources fully and efficiently but also stimulating our creativity in how all this technology can be exploited in a musical or artistic context, not to mention the huge amount of money we can save once we realize we can adapt, customize, tweak, repair, open, cut, install and hack all by ourselves.

In understanding what a laptop is we have to divide it into two realms: the physical and the virtual. What I keep finding is that the physical realm, the hardware, is quite similar if not identical for most of the laptops. The simplest proof is the fact that the components of a Mac Book Pro can also be found inside, say, a Dell laptop!

The virtual realm is the software. That includes the operating system (either Windows, Mac Os X, Linux, etc.) and the specific programs pre-installed or installed by the user (any office suite, Internet browser, Skype, etc). The software is what lets the user interact with the physical hardware. For example, if the computer musician wants to use the microphone of the computer, he/she cannot simply turn it

on and speak to it, the user must open a program specialized in communicating with that piece of hardware: for example a simple voice-recorder program, or something much more complex like Logic Pro or SuperCollider.

The laptop is such a powerful piece of technology that it can be used for many different tasks, so specialized software companies develop specific programs to suffice specific needs: browsing the internet, interacting with video hardware, programs specialized for working with the audio built-in equipment, and so on. Most of the users will be limited by this software in order to interact with the laptop's hardware, so when aiming to record audio, for instance, they will only be capable of doing so when purchasing a specialized software like Logic Pro, or in better cases downloading a community maintained open source software like Audacity. However, the new generation of computer musicians, the one i am interested in, is capable of interacting with their laptop with no limitation except for one's creativity. This is achieved in many ways, both in the hardware and the software side of the laptop. Before we discuss this, let's quickly explain the basics of the laptop hardware and what I consider is the minimal requisite for using a laptop as a musical instrument/device.

Luckily all laptops are equipped with audio hardware, probably intended mainly for entertainment and communication rather than creative-artistic means. Sometimes for more specific artistic means we would need to buy (in exceptional cases *construct*) hardware enhancements or extensions that add more refined possibilities. But the laptop itself, as it ships in, is already more than good enough for

any creative mind, given we know how to make the most out of it. The audio hardware will by default include a set of speakers (normally 2 hi-definition mini speakers) an analog audio input (mini jack) and an audio output (also mini jack, to connect headphones or external speakers). These are the ports of a sound card with a chipset that is responsible for all the audio interactions and transformations. Nowadays sound cards are even a part of the motherboard (the circuit board that is the platform where all devices inter-connect), which makes everything cheaper. The very basic function of this sound card is to transform the analog audio inputs into digital data, which can then be used by softwares to do all kinds of things (turn it back to sound, process it someway: unlimited possibilities once it's digital). Here is the first essential trick for a computer musician, the analog inputs to the sound card (voice, air vibrations through a microphone) are nothing more than electrical signals! so we are not only limited to use sound for generating these electrical signals: the audio input will also register any change in the electrical current so we can feed into it whatever creative system we want once we wire it to the input: electromagnetic changes (with a radio antenna for example); any close circuit contact (simply by touching copper wires connected to a mini-jack head); all kinds of home-made sensors. The magic of the computer musician begins to happen: we can achieve all these peripheral inputs with junk and old recycled electronic equipment (toys, old radios, etc.) plus some patience in achieving the desired results. It's all do-able on your own, without being a

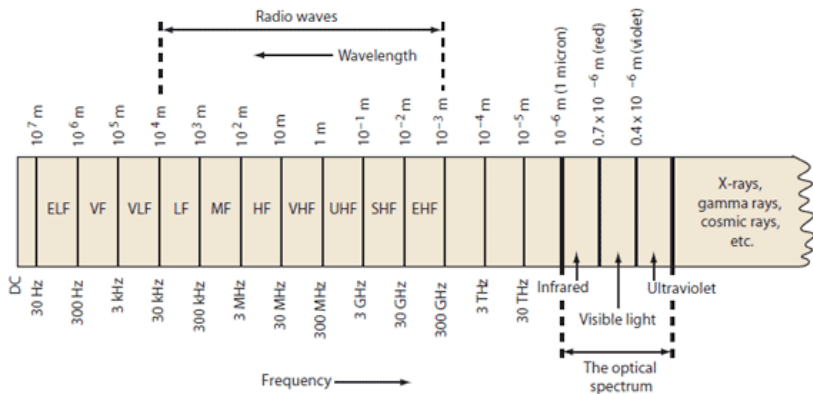
specialist, and it's all extremely low budget³ (the costs are translated into research and application time, but who can deny this is stimulating for times of crisis?).

Other pieces of hardware will also be vital for the laptop to at least turn on (like the main processor, the hard drive, and other generic components of computers) but we will consider this default in any modern computer so we don't need to explain them here. For the interested reader there are loads of information of this topics on the internet. Apart from the sound card already described above (that is the most essential for a computer musician for obvious reasons, though not a must!) I consider of extreme potential a good communication cards, which are responsible for communication with other devices. This can be done through serial or USB⁴ ports but for my specific research wireless communication is the most interesting. With the advent of internet and mobile phones, the wireless intercommunication technologies have been developing greatly. Now every laptop is equipped with a hi-end radio receiver-transmitter. This sounds like an old radio device but in fact wireless internet also works with radio signals, and so does Bluetooth technology. They

³ None of my last year's projects have exceeded in average a technical budget of €100 per project, of course not counting the laptop as part of it.

⁴ USB stands for Universal Serial Bus, which became an industry standard for communication ports between computers and devices in the mid 90's.

are all part of the same electromagnetic spectrum, but each refers to a specific frequency range:



The part that says 'radio waves' is for all those frequencies that can travel through air, the so called wireless communications. Our laptops are normally equipped to be able to transmit and receive frequencies within the radio range (and the 'visible range' if we consider the built-in cameras normally used for Skype and the like!). Of course the wireless card inside our laptop is designed to meet standards for a good operation, so that the WIFI card for example, only 'tunes in' with the frequency range of WIFI modems, and the Bluetooth card to only respond and transmit in the Bluetooth range (2.4GHz+-). However, here again comes in the anxious hand of the computer musician. The wireless cards can be set to receive and transmit in other frequencies (in most of the cases, depends on the card) but this configuration is hidden from most of the users. Thanks to forums and open information we can find guidelines on how to

achieve this, and it is so real to the extent that when engaging in such a task we even have to be careful of not violating radio frequency laws that operate in the country we might live in!

If preferring to avoid problems, one can home-build antennas to expand the wireless response of our communications card, or even extend it with devices that nowadays are ridiculously cheap. How can one explain that GPS, once a military satellite technology, is now affordable and generic in most of the new generation mobile phones?!

All this techno-junk, however, is useless and just remains a curious fact of our laptops, unless the computer musician is able to apply it artistically. The point here is that we have a very powerful and affordable tool in front of us, and under the right eyes-brains-hands one is invited to imagine the artistic results. Chapter 6 will explain how this inter-communication potential is the core of my artistic trademark during these last years.

The software installed in the laptop, not counting the operative system, will differ as much as the different names of laptops we find in the market, even more. The special programs designed for music, for amateurs and professionals alike, offer a wide range of possibilities and it is out of the scope of this handbook to mention everything that the market has to offer. The computer musician is free to choose from this ever evolving pool of programs, it is a matter of finding something that suits your needs as a musician and then mastering its use so as to be able to get the most out of it. Power users will even be able to use programs in musical and artistic ways that the

software was not even originally intended or designed to do. This is the profile of the new generation computer musicians. They are not only able to adapt the physicality of their laptop but also the programs. The act of tweaking software to meet creative needs becomes interesting in two ways: On one hand there is software which is not designed for music but the user will find a creative way to re-interpret it and get an artistic musical result. An example of this is in the internet Appendix⁵. In this same category one finds corporate software (the one the user has to buy) which normally operates in a black-box manner (that is, unknown to the user) but after mastering its possibilities a high artistic result is achieved. This is the case for example, of musicians like *Tara X* who specializes in Ableton Live and uses nothing else. At the other pole of the power users we find those who will not suffice with corporate software so will develop their own software (!) or use highly adaptable software like SuperCollider, which is actually a programming language, meaning that you can do virtually anything you want, up to what your programming skills allow. SuperCollider, for example, is a free, community maintained programming environment specially designed and developed with musicians and sound researchers in mind, so most of its functions will already be pre-disposed for interacting with the audio hardware. The beauty of these kinds of environments (the now popular Processing⁶ also falls into this category) is that it will first develop a new skill in the computer musician: that of the pro-

⁵ please see the References chapter of this handbook for the address.

⁶ <http://processing.org>

grammer, so the computer musician now becomes a software alchemist, a pro tweaker who can eventually understand and extend the programming skills to other languages with ease which in turn starts transforming the virtual realm of the laptop into a sort of soft clay that can be molded anyway. Again, the toll here is not money in a commercial sense, but the time and patience to learn the programming language(s) and a high motivation and spirit to move forward and achieve the desired results, since the computer musician is, at least in my case, a musician at the core and not a technician or programmer.

To end this chapter I want to share the basic⁷ hardware and software I use to develop all my artistic projects: from solo live performances, to ensemble, opera, and sound installations.

HARDWARE:

- Dell Laptop with Intel processor, 2 bluetooth devices (100m range capability), Dell Wireless Card 802.11 b/g, 4GB Ram
- Cheap radio receivers-transmitters (10 USD each). Also known as generic wireless microphones.

⁷ I call it basic because it is the essence of what I use in my projects but this hardware/software most of the time depends and is related to other parts of the laptop, which are either more generic or make little difference in the artistic results.

- Cheap Generic Infrared and accelerometer hand sensor, Bluetooth range (commonly known as Nintendo Wii controllers - I use the generic chinese cheaper version though :0)
- Screen damaged Ipod (4.2 iOs) with Wireless and Bluetooth capabilities (price: 25 euro)

SOFTWARE:

- Mac Os X 10.6.8
- SuperCollider 3.5.5 and Ableton Live 8

MUSICAL POTENTIAL_

Using a laptop in music practice was already realized long ago, since one could trace it back to the 50's¹ with the first generation of research-institutional computers. It is sometimes hard to realize that the laptop as we know it today, in its domestic form, is thousand



times better, faster and cheaper than what was used in those first generation computers. I was born in an era of personal computers and I am very amazed to think that 40 or 50 years ago you could only be a computer musician if you were part of an elite group with access to the institutional research equipment in either the famous studios in Cologne, IRCAM, London, Denmark, among many others, or in the universities like Princeton and Stanford. Without access to any of this room-sized computers, there was not really an option to become a computer musician, except for a domestic do-it-yourself

¹ Although the 'first' computer was the ENIAC in 1946 developed as military technology in Pennsylvania, it was until 1957 that Max Mathews developed MUSIC I for an IBM 704 at the Bell Telephone Labs, and the musical potential of the computer was unleashed. (Manning, 2004, p. 205)

community that emerged in the late seventies after the silicon revolution.² Though the scope of this handbook is not historical, but rather the new and innovative forms of the laptop-music marriage, a brief image historic-flow of computer-music is given in *outline A*.

It is a fact that the ease of musically exploring a computer is a task that requires many computational, electronic and programming skills that could be considered extra-musical. Historically, we can see in all the famous cases of music oriented/assisted composition and performance that the composer depended on the work of an expert in the field or was himself coming from a scientific background. In Xenakis' case, for example, he was able to develop his musical pieces in FORTRAN thanks to John W. Backus; and the history of MUSIC# software wouldn't have been possible without researchers and scientists alike.³ It is also very interesting that historically all the musicians that started exploring the computers' capabilities were mostly (if not only) composers, and it is only until recent years that non-composer musicians are also including the computers in their performance practice. Even said so, any computer musician will always have something of a composer because the task of choosing, organizing, programming, and synthesizing

² The first Apple computer (among many others) was even meant for the buyer to assemble. The silicon revolution caused that prices and sizes of computers to drop extremely fast, while the processing power and speed raised.

³ For a great in depth historic trace into computer-music software and hardware development I recommend the book *Computer Music*, by Peter Manning. See References.

electronic sounds for the musical practice is in a sense a compositional task. Composition is far more reaching than just notes and pentagrams on paper. When engaging in the world of sound synthesis (that is - creating a sound) and sound processes (self-explained) one is composing, or at least employing skills that all composers also employ in the act of composition or when orchestrating. I believe this is the reason for the curious fact that most pioneers and developers of computer music are composers.

OUTLINE A. Brief history of the computer-music practice



In the mid 50's Max Mathews and The Bell Telephone Laboratories discover the power of synthesized sound and the aid of computers for broadcasting. MUSIC1 software is developed. This program calculates basic parameters of sound to

generate digital audio waveforms.



In the course of the next years computers were becoming faster and smaller, and the MUSIC# programs were developing to meet the new computer architectures. But it was until 1970 that M. Mathews



and F. R. Moore introduced GROOVE (Generated Real-Time Output Operations on Voltage-controlled Equipment) which 'opened' the door for composers to explore the computer music world more

intuitively and with faster processing times, aiming for real-time performances. By this time many education institutions and broadcasting studios owned a computer.



By the late 70's some manufacturers were giving special attention to



audio. Commodore and Apple computers being the most important. Computers were being equipped with two small speakers (first only used for system alarms!) and a variety of ports for interface communication. The Apple II com-

puter became popular, mainly because it hosted music applications (like Music Master) and a graphical interface which could even display music notation. Later, during the 80's, many accessories and

expandable MIDI boards were specially developed for this computer.



In the 80's, computers were getting finally small enough so that computer-music enthusiasts could be emancipated from the institutional research elite. MUSIC# software was evolving into derivatives so that they were cross-platform, the most important developed at MIT and written in C, one of the most popular programming languages up-to-date. It is CSOUND, still available and in moderate use, and it set the essence for other sound synthesis programs such as the nowadays popular SuperCollider. Smaller computer sizes meant a huge step in practically possible Live electronic music. The MIDI protocol was launched in 1983, which standardized the communication between computers and electronic instruments.



Eventually manufacturers were already aiming for even smaller portable sizes, like the Commodore 64 laptop. This is the dawn of the laptop artists.

During the next decades, the basic protocols and essence of computers didn't change at all. The main differences are that computers became smaller, lighter, faster, more powerful and cheaper. The MIDI



protocol is still in use today but new protocols are emerging, such as OSC (Open Sound Protocol) which is optimized for modern network technology (aka The Internet).



The past 2 years mobile technology is dominating the computer market, and this palm-sized computers are thousands times faster and cheaper than the computers shown in the first pictures. Communication protocols, though before were meant to be wired (MIDI, USB, etc) are

tending towards the wireless. Though this devices are still not powerful as a hi-end laptop, one can already 'do' music with them but their main contribution for the computer musician is the fact that they are equipped with a handful of sensors and resources that could be exploited musically in conjunction with a more powerful computer.

Nowadays computer music seems to have two main forms of expression, which also occur in their combined form in many projects, including my own. These two lines of computer usage are: *computer-aided composition/studio work* and *Live (real-time) performance*. In chronological terms the second one is newer, mainly because the older generation computers were not powerful and compact enough as to be logistically practical for real-time usage.

Computer-aided composition

In this category we may consider all studio work, from composition, to production, mixing, post-production and even recording. I find all of these activities part of a creative flux that for me all can be considered composition, given that these activities are creatively approached. To understand computer-aided work we have to think of the laptop as a compact-sized version of the computers that were first used back in the 50's. The main differences from back then were the processing power, reliability and speed, and the friendlier user interface. In basic terms, the computer serves as a fast calculation device that can generate data and then apply operations (mainly mathematical) to that data. In this sense, mathematical composition finds a great ally in computers. Many of Xenakis' pieces were developed with aid from computer calculations, especially when the piece is based on the processing of many complex calculations, as in the case of stochastic music.

The new software graphical interfaces are also nowadays developed so that the user can work more intuitively, without the need of specific mathematical knowledge. That is the case of many music programs, mainly studio programs, where one can cut, modify, modulate, filter, and process audio data in many ways but with simple button and mouse clicks. In the core of the program complex calculations are occurring, but in this case the composer/user is only concerned with the result and so doesn't need to know or understand the details of such calculations, but rather the consequences of those calculations, expressed in terms of the resulting audio. These intuitive processes often occur within a *trial and error* methodology which, thanks to the fast processing power of today's computers, is very practical and efficient.

Live (real-time) performance

Soon after Max Mathews developed the MUSIC1 program, he realized that computer-music was needing more than just a powerful processor to manipulate data, but that it must represent that data in a meaningful and artistic way. He thus turned his attention into developing systems that are aimed at Live performance and control. That is how GROOVE was developed in the 70's and it set the tone for the way musicians and composers alike would approach electronics in a performative way. If we turn our attention into the later development of music technology we see that it had at it's main focus the ways in which a musician would interact with the computer.

During the first generation computers, in order to interact with it, the user would have to punch holes into a card.⁴ Later on, control extensions would include more knobs, push-buttons and jumper cables, until the alphanumerical keyboard was introduced. This keyboard became then a standard input source while new interface mediums were being developed, like the now common mouse. In the 80's the video monitor started an era of graphical interfaces, that can go up to nowadays touch-screens.

The musical instrument manufacturers would play a key role in this respect with the development of synthesizers and the MIDI protocol, with which musicians could finally interact with their computers via a piano-looking keyboard. The keyboard, presented in many sizes, established itself as the main controlling interface, but now and thanks to the use of internet and the Do-it-yourself communities, more unorthodox interactive systems are constantly evolving, in which we could include light sensitive sensors, accelerometers, and many other cheap sensing devices.

With today's systems and extensions the computer musician will have very little, possibly no limitations in the real-time processing capabilities of the computer, so the attention, I believe, is shifting to the performative aspect of computer music, and this is far reaching and has still a lot of room for creative development. It is not the *what*

⁴ Not to mention that those computers were not able to process calculations fast enough to be considered 'real-time'. I believe that it is from the 90's onward, specially nowadays, that the 'real-time' is finally conquered within all-digital systems and complex operations.

but the *how* of computer music that amazes me and continues to surprise me with every technological step the computer and mobile industry is taking. Within this fascinating artistic community of *how-to's* we need to consider the Do-it-yourself enthusiasts that have received a boosting platform in the internet. Thanks to these communities who are more than keen to share knowledge and information in the forms of guides, tutorials and Q&A forums, one is able to hack into the hardware and software of the computer/laptop easier than has ever been before. With this acquired skills lies another artistry I also believe exploits the musical potential of the laptop. That is the group of artists who modify and tweak programs or electronic laptop parts that are not originally intended for music but nevertheless can produce musical results in various forms.⁵ The historic example is the fact that the first computers did not have speakers, and the first time they were included as part of the main frame they were intended only for system alerts, but enthusiasts and amateurs alike dug into the pins and workings of this speakers to be able to reproduce more than one tone, and eventually known or composed melodies. I still remember those old computer games where the music and the sound fx came from the low quality low-bit speakers! That was creativity at it's best.

In this way the modern computer musician is slowly emancipating from the technological limitations of brand systems (Windows, Mac, Dell, HP, etc.) by not only modifying but also extending those sys-

⁵ See Appendix for a personal example which can be emulated in any Mac OS X system.

tems within the comfort of one's house⁶, and producing a wide variety of artistic results, some good and some not that good but all contributing to this artistic liberation.

After this chapter, hopefully the reader has acknowledged the laptop (or personal computer) as a potential musical instrument, so that now we may continue to the philosophical and artistic side of laptop playing. In a performative context, the laptop may be an instrument that can play on it's own or one that could be *played* by a performer, and the implications of such approaches is to be fully discussed in the following chapter.

⁶ Even to the extent of mechanical automation, or complex sensor systems: the reader is invited to browse <http://www.kobakant.at/DIY/> for a glimpse of the overwhelming possibilities the Do-It-Yourself approach offers.

ALIVE OR NOT ALIVE?_

*"By the late 20th century, our time, a mythic time,
we are all chimeras, theorized, and fabricated
hybrids of machine and organism; in short,
we are cyborgs"*
D. Haraway

When Donna Haraway wrote those words in the mid 80's⁷ she intended a political, social and ironic metaphor of post-modern feminism. Back then, the cyborgs, half human - half machine, were also half reality - half fiction. In our days, 2012, the cyborg manifesto and ideal is not only very tangible in technology itself (mechanical prothesis controlled by a chip inserted in the brain⁸) but within the arts, and in my point of view, it is central to understanding how electronic music (or any other technological-electronic performative art) is being, and will be performed.

But before we dig deep into Haraway's ideas and use them to justify many of today's practices, including my own, we will take a look into what is meant by *Live performance*.

As we saw in the last chapters, electronic/computer music only recently acquired the sufficient technological requirements to be able to be performed in real-time. However, the fact that the computer

⁷ Haraway, 1985.

⁸ BrainGate, 2008.

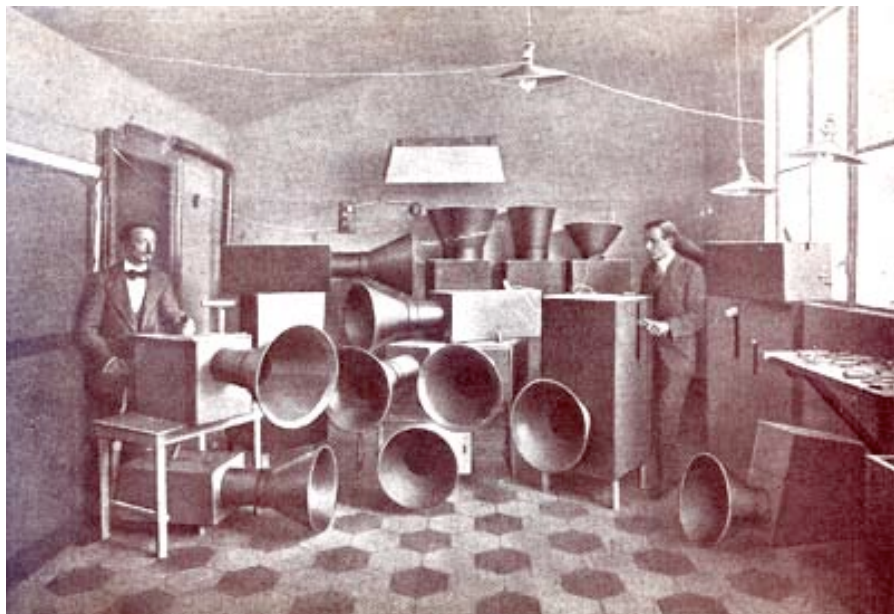
can nowadays calculate and operate data in millisecond frames, doesn't mean that it is therefore sufficient for a *live* performance. Simon Emmerson wrote an excellent, updated, overview of the idea of *Live* electronic music.⁹ Although Emmerson's essay doesn't focus specially on the use of computers (rather in electronic music, which can be done without a computer!) he defines a theoretical platform from which we may *relocate* the word Live within the electronic musical context.

In the music tradition, we are accustomed to always see a human being perform an instrument. Every time we attend a concert we know it is *live* because the body, the human, and his actions are related, visually, to resulting sounds. When we see the cello player bow we hear the string resonate. The body and the movement actions all are interpreted by our senses as now, as the present and the presence. I believe these are two key words for understanding the meaning of *live* within today's technological context: *present* and *presence*.

The way instruments were designed before the digital era was such that they could not produce sound unless with the help of the human agent. The industrial revolution brought up many new inventions where new mechanical instruments were able to produce sounds without the immediate or conspicuous human aid. Think about the *intonarumori* by Luigi Russolo in the early 20th century,

⁹ Emmerson, 2007. Chapters 1 - 3 are specially recommended.

where mechanical boxes would produce different 'noises' either by performers pulling or rotating levers.



Gradually, with the progress of technology the human agency for producing sounds became more obscured, more indirect.¹⁰ With magnetic tape machines one would only need to push play to make it sound through loudspeakers. With computers, the movement of the body for inputting data became so compact as to reach nowa-

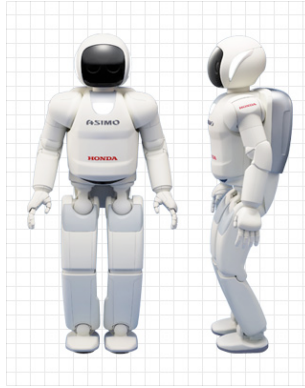
¹⁰ Though in parallel some inventors and composers were still worried about the body-sound production relation. Interesting examples are the *Theremin* and the *Potentiomètre d'espace*.

days only discrete movement from the fingers (on a keyboard or touchscreen) or simple, tiny, wrist and arm movements (with the mouse) or even just the voice (speech recognition in mobile phones, for example). If one compares these movements with the movements of a cello player, for example, there is a huge difference in the audience perceptual clues of movement, and thus presence. To add another element of complexity: graphical interfaces which are now standard in computers (aka screen monitors) hide the performer's upper body behind it, making it now impossible for the audience to even see the movement of the hands of the laptop performer. How can we know then, as audiences, that the electronic sounds we hear are produced by a human performer? how do we know it is in real-time? and how do we know it is real, not a mimic illusion?

Computer technology has taken one step further bringing us the possibility of *automated systems*, which are mainly used in sound art installations. In such a system the computer, after being programmed and started, needs no human agent whatsoever into developing a piece, since all the data processes and operations are automatic. In this respect there is a lot of research into artificial intelligence algorithms, where the computer can process new data through sensors, and even 'learn' from that data in order to re-program certain functions by itself. A very quick youtube search on robots and we will see new experiments by Honda¹¹ and other com-

¹¹ Honda Motor Co. 2011.

panies that are building humanoid robots which are fully automated and even look ‘alive’.



So in the case of these automated systems, for example, the data/sound processing is occurring in real-time but can it be considered *live*?

To tackle this issue we will be limiting the idea of *Live* performances to that which has immediate and direct human, real-time manipulation, on the side of the performer.¹² What is interesting here, is that the human agency doesn't need to be obvious, or even visible. This is one of the main aesthetic paradigms of my own approach.

Thus, the case of automated systems and all those systems that don't have real-time, human manipulation fall into another category, which I will call *automated* performances, and which are not the focus of this research, although one can find cross-fading points, which include elements of both, or even *environmental* or *interactive*

¹² Because on the side of the audience we are always perceiving ‘real-time’.

performances: where the system might be automated because it is presented in such a situation where the audience interacts and becomes a processing factor thus providing the illusion of *present* and *presence*.¹³ Sound Art has exploited these relationships in various great examples¹⁴, but this will also be out of the scope.

In the case of laptop playing, artists have addressed some of the above mentioned issues in different ways and according to personal tastes and artistic tendencies. A very common practice, however, seems to be that laptop artists are trying to avoid the laptop on stage, or in front of one's body, as well as avoiding a normal table-laptop-chair setup, which is the setup that is common, if not universal, for studio work. Most modern artists that I have looked into for this research perform standing up and with only some controllers in front of them. I believe that the reason for this is an intent from the performer to be 'clearer'¹⁵ for the audience, with more direct visual contact, as if a laptop and a table act as some sort of barrier or screen against the audience-performer relationship. What still remains an enigma is why they all play standing up, since their lower body

¹³ I would like to avoid categorization, because we will always find exceptions, but for practical reasons i am forced to make them.

¹⁴ Cardiff & Miller, 2012.

¹⁵ So that the audience can easily perceive the movement-sound relationship, so common for our *live* tradition.

moves very little or not at all¹⁶, and for comfort and practicality I would still consider sitting down better, specially for long works.¹⁷



Robert van Heumen, with his duo project Shackle, using a Joystick controller.

The fact that the laptop players are re-considering the visual aspects of their performance practice, some of them also tend to include more layers of visual extra-musical parameters. They not only focus on laptop playing but on the performance experience as a whole. There seems to be a strong tendency to include video, as in the case

¹⁶ At one point I thought this was influence of DJ music, since DJs perform standing up, but they actually do it because they also dance to their music somehow. In the case of experimental concert music I very rarely see a performer dance to his/her music.

¹⁷ In my own opera performances, I prefer to sit down, but I do avoid a table, and try to experiment with different scenographic objects to place the laptop: from simple wooden cubes, to custom wheeled platforms.

of Henry Vega, which is also reactive or interactive to the music.¹⁸ In this cases where the performance experience becomes an important aspect of laptop playing, we also see more care in the way the stage is set up, and even the use of lights, in a more theatrical manner.

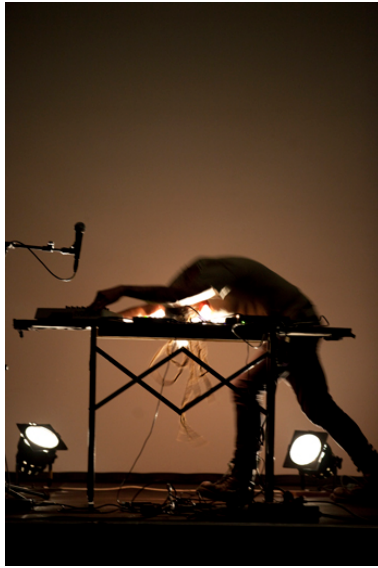


Henry Vega, in wromsongs no.2

Other approaches, though less common, include the use of mechanical sound installations (for example robotic arms to play percussion instruments¹⁹) or a wide variety of new electronic interfacing instruments developed in various research centers, like the SARC, in Belfast.

¹⁸ Henry Vega often collaborates with interactive media artist Emmanuel Flores, for example.

¹⁹ Kirn, Peter, 2005.



One Man Nation

To conclude this chapter it is interesting to note that the laptop is contributing to the *live performance* practice in meaningful and understandable ways, but at the same time it opens an opportunity to even challenge the notion of *live* the way cyborgs challenge the notion of gender. The laptop can be considered an extension of the performer's body, and in this sense, the performer can even be hidden from the audience. How can we know it is *live* then? We cannot know in the same way we cannot know if a robot can develop consciousness. It creates what I call an illusion of *live*, just as the ancient art of puppet theater did since it was invented, thousands of years ago. This is the strong link I find between the way I am researching to employ electronics in what I do, and the cyborg manifesto of Donna Haraway and post-modern notions of gender: We live in an

era of trans-gender, beyond gender, and trans-body, beyond the body. With the laptop, the computer musician may become a *trans-bodied performer*. Here lies the essence of my newly found artistic passion, and will be further discussed when dealing with my personal approach in chapter 6. But before that, we will take a look into two laptop artists which I consider have approaches of the highest artistic quality.

CASE STUDIES

Tara X

Tara X is a transgender sound and performance artist born with the name Marc Chia Xiang Rong in Singapore in 1982. Tara is currently based in Granada, Spain, as the co-artistic director of *The Unifielded*, an artist collective concerned with experimental sound, video and performance art.

Chia's roots are interesting, because they seem to flourish and become clear not only with Tara's lifestyle but also through his performances. He comes from a major and masters in Media art but was since a teenager influenced by the 'punk' urban culture. It is difficult to avoid the implications of tattoos, piercings, attitude and women's clothes in Tara's intimate performances. All these factors make Tara's live performances worthy of attention as they transcend the boundaries of sound/art or electronic music, to become more like collective, immersive experiences.

"...I am currently going through a conceptual/initial phase of a new life project ... There isn't a project title, but the premise is pretty simple, I'm going to start living, or have already been living as a transgenderist, that's a bit of the iceberg for now..."

Before this recent life-transitioning project *Tara X*, Chia was in the summit of a project started back in 2004: One Man Nation. It is based in solo and collaborative performances with a very clear per-

formative statement, which in many ways is inspiring and also hints why it has been so successful, having presented performances and workshops all over the world including The Guggenheim Museum in Bilbao, The Singapore Art Museum, STEIM and Bimhuis in Amsterdam, The Contemporary Art Museum in Taipei, among many other important venues.



“... the use of every part of my body as a whole, that presence with the inclusion of the sounds produced by the intended or accidental gestures and physical actions – everything is technology making anything and everything potentially an instrument, a source of sound, a critique – the avoidance of a priori drawn ways, ontologically reinventing the possibilities of life, and as a living performer/artist, exploring all the possibilities in the here, in the now...”

When I read this statement, and then look into Tara's work everything makes sense. The sound sources go beyond the laptop, which we don't even see on stage¹, and through the use of contact-piezo microphones the sound sources become his midi controllers, the table and chairs around him, the *environment* as a whole. In Chia's ideal performance the audience doesn't sit in a theater, nor they stand at a distance from the podium. There is no podium at all and in the best situation the audience is around the table to where he is performing, really close, and become part of the performance, part of the *environment* and part of the experience. It is also interesting to note that Tara's performances occur mostly in alternative venues, avoiding as much as possible the theater-podium tradition. Most of his venues are very urban: rooms, galleries, street corners, pubs and bars.

"... I do not see myself as some kind of artist musician that people came to watch from afar, I would like to think we as a whole collective body, the audience and me, would go through some sort of experience together through the setting of an experimental music concert..."

If I am to take now a look into the music of Tara, only the music, I would say that Tara's music is more than just sounds. One cannot experience his performances for what they really are just by closing the eyes and listening. The room, the sounds, the body, the gestures, all play an important role in his artistic statement. But if forced to

¹ Tara states *"the computer screen blocks communication in so many ways – with yourself and the people behind it"*.

isolate sound, we will notice that his raw material comes from field recordings and samples, like distant trumpets, voices, screams, water drops, urban soundscapes, which are most of the time processed in an anti-articulated, anti-rhythmic way through carefully built virtual instruments in Ableton Live. The way the sounds develop and unfold are influenced, as said earlier, by the environment, so improvisation plays a key role in his compositions. The way Tara can react to this environment, in real-time, is through the use of midi controllers: a 64-button 'monome' controller and a fader midi interface, equipped with self-built piezo-microphones inside, and in some cases also a voice microphone to catch voice generated 'live' sounds.



Tara's main controllers

I believe that Tara X's project is a successful one. There are many points in his artistic statement I share with my own, the most relevant being that we both seem to think that laptop/computer music needs of extra-elements that escape the tradition of 'serious' music performance. We both believe in the need of the body as a performative tool in order to be closer to the audiences, and we both care much about the space where the performances occur. We approach these factors in very different ways but the essence and drive of this concerns seem to be the same.

"... a lot of the sound art I come into contact that tries to give the impression of being highbrow and experimental is boring to me..."

Although Chia has solo performances as One Man Nation or Tara X, I think that the most successful pieces are collaborations. The performance experience becomes richer to the audience, in a musical sense, like in the case of *The Future Sounds of Folk*, a project I saw live in Amsterdam where Chia teams with two other Singaporean musicians playing traditional instruments, or in the 2012 duo project with Pierre Bastien² (1953) an expert in DIY³ musical machinery. To conclude, Tara has a very peculiar way of performing live laptop music, and it is aesthetically very different from my own, but our projects share many views in relation to how to get closer to the audiences, and what can make a *live laptop performance* interesting and not bor-

² It is interesting that Bastien's musical machinery is also loosely related to my vision of musical machinery, but in my case this *machinery* is controlled by a hidden performer.

³ Do-It-Yourself.

ing. In a sense, i guess that what I like most about Tara's project is the 'anti' position towards the norms: the musical norm, the musical tradition, the performance tradition, gender traditions, and even political models. This 'anti' rebellious idea, post-punk, is very appealing to me, especially when I feel disappointed by art institutions or art norms, or after attending an electronic concert and feeling ripped off, unmotivated, uninspired. Tara reminds me that the urban culture is flourishing just outside our windows, on the street, under tunnels, and that the academic and institutional sphere is only one part of a more complex and rich artistic environment. For a transcription of the interviews I had with Tara and Henry please refer to the appendix website.⁴

Henry Vega

Henry is a composer and laptop artist currently based in Den Haag, NL. He was born in New York in 1973, and after studying composition in Florida and two master degrees, one in Texas and one in Den Haag (in Sonology) he culminated his studies with a Phd in Music and Sonic Arts at the SARC⁵ in Queens University, Belfast. He is a proficient musician, with computer and coding experience in various programming languages and he has performed or his pieces have been performed around Europe and America.

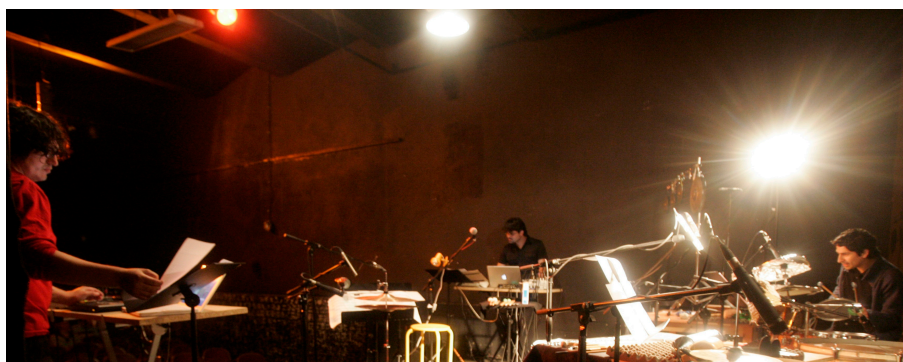
⁴ See References.

⁵ Sonic Arts Research Center.

Though Vega might seem more of a ‘traditional’ composer than a laptop performer (as in the case of Tara X) it is remarkable the use of the laptop in his work. His laptop pieces range from solo works to ensemble writing, where the electronics are sometimes live and sometimes not. In relation to live laptop performance he has produced interesting projects, where I would highlight ‘The Electronic Hammer’ and one of his latest award-winning pieces ‘Wormsongs’.⁶

“... one of the themes that More⁷ talks about is overcoming the fear of technology, learning to coexist with it and internalize it...”

‘The Electronic Hammer’ is a percussion-laptop trio founded in 2003 with percussionist Diego Espinosa and laptop-performer-composer Juan Parra (who is actually in a Phd concerned with laptop performance practice). The trio is mainly concerned with the recent demand of specialized performers for pieces with *live electronics*.



⁶ 1st prize at the John Cage Year 2012 composition competition in Ireland.

⁷ Philosopher Max More is known for his texts concerned with the challenges and strategies to cope with emerging technologies.

After success and support from institutions such as Gaudeamus or The Royal Conservatory in Den Haag, they were touring regularly until 2010, premiering and commissioning pieces of well established composers in the field, such as Richard Barret and Yannis Kyriakides among many others. I also find extremely appealing that the trio along their performance practice was also organizing educational workshops for computer programming, percussion techniques and instrument building.

The repertoire and practice of 'The Electronic Hammer' show that they enhanced laptop performance by mixing it with a traditional instrument: the percussion, which in turn would compensate for the lack of performative cues (body-movement-presence-sonic event) of bare laptop playing. For an audience this compensation may prove enough, but it is also true that then the main visual focus is shifted from the laptop performers to that of percussion playing, since its performative cues are more direct in such a way that they tend to overshadow the laptop performers. However, projects like these are extremely important for the computer music world, since it represents a successful approach of three young computer musicians in their quest for a performance practice at the same time they also contribute to the awareness and understanding of their instruments with their workshops. The computer musician learns and develops thanks to community contributions, so workshopping and sharing one's work (either on the internet or by any other medium) is still something that must be encouraged and supported, for these are part of the roots that today hold together computer musicianship.

Among Henry's individual projects, 'The wormsongs' deserves mention and further analysis. It was developed in the course of 3 years in collaboration with singer Anat Speigel and visual artist Emmanuel Flores. This piece is based on minimalist aesthetics and Futurist texts.⁸ The instrumentation is simply the laptop, the singer, and the video.⁹



Vega defines the aesthetic in this piece as 'micro-minimalist'. The musical foundation is the written text which is interpreted by the voice in a syllabic mono-tone manner. The rhythms, articulations and textures of the recitativo-like voice interact with laptop generated sounds controlled live by Vega, and sometimes the voice is also

⁸ Though Vega himself also wrote original texts for some of the songs.

⁹ I consider the video as part of the instrumentation because it is being 'played' live, and is unmistakably part of the performance experience.

sampled live and processed in real-time to enhance the musical consistency.

“... once you hear the music performed and see how Anat and I react together on stage, how her voice becomes multiplied and then reconvenes back to her, you get a sense of something novel melting into a thick paste with something traditional...”

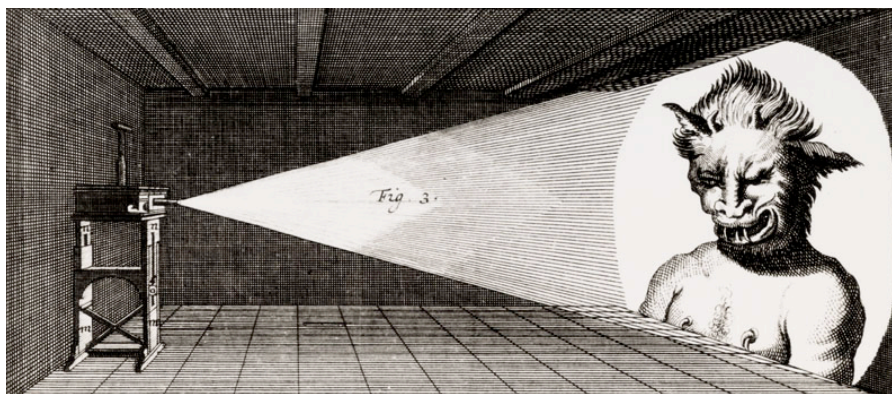
What I am surprised about in this work is how the musical result is very clean and easy to listen and follow. Despite the seemingly cluster of information (video, singer, electronics performer and a variety of digital sounds) the overall effect is that of a very well balanced multimedia experience, where the counterpoints between the disciplines is well taken care of. I notice a very efficient use of the laptop instrument, all coded in SuperCollider, and the way the voice, video and electronics bend together. This degree of transparency in the music is not only a result of the ‘micro-minimalist’ aesthetic but also a result of the years of experience of Henry in the computer music practice.

For the ‘wormsongs’ he reduced his *live setup* to the laptop (running Logic Pro and SuperCollider), an audio interface, a small 4 channel mixer and a simple light-weight pad. Throughout the performance Henry hides the laptop from the audience and rather performs standing up behind the pad, the interface and the mixer. Henry’s movements are limited to the hand and the eye-sight (the latter apparently to communicate with the singer) and sporadic ‘on-off’ midi messages that are sent through the pad, with a rather exaggerated gesture of the hand, probably also to serve as cue for the singer.

"... the musical style is aimed at being as simple as ones-and-zeros, starting material and stopping it in unspecified coordinated lengths. Out of these ones-and-zeros something beautiful emerges: the rhythmic randomness of the words, the intensity of the performance..."

The differences and similarities between the two artists presented serve as to represent approaches to *live performing* that I consider of interest for the computer music practice. It seems that both artists are aware of the limitations of laptop playing, and thus have tried two different strategies to overcome that issue. Tara X takes the body and the movement to another level of performance, while Henry Vega exploits the interactive video to support the laptop. I also like these two examples because of the essential differences, body and mind. Vega's work is more manufactured and 'composed' while Tara's performances are less pre-meditated but very closely related to first-hand emotions. For their similarities, they agree upon the idea that the laptop performance goes beyond sound, in Vega's case calling it a *multimedia* performance and in Tara's case an *environmental* one. These two examples of laptop musicianship represent, to my opinion, most of how artists are currently applying the laptop in a musical context. With this as a reference we can now take a look at my personal approach in detail, which explores a different path than the ones explored in the examples of this chapter.

MAGICAL REALITY



"Any sufficiently advanced technology is indistinguishable from magic"

Sir Arthur C. Clarke

Reality, Magic, Technology. Or should the order better be: Reality-> Technology-> Magic? or Technology-> Reality-> Magic? The truth is that all these three words, in any of their combination, represent the essence of what I am calling *Magical Reality*, a term I coined for describing my work in 2011 after a November Music commission for a harp piece.¹ What I didn't expect back then, was how influential this idea was going to be in the next years, or how it was already an unconscious part of my artistic approach since some time before. In the following paragraphs I will recall the beginning of this personal ar-

¹ Gradil de Carybé for solo harp and hidden electronics. Video available at http://felipeignacio.info/resources/Gradil_de_Carybe_iPhone.m4v

tistic quest, it's foundations back then, and the new foundations I am still discovering, even this same day I am writing these words.

Magical Reality is the inspiration behind my electronic works nowadays. It is mainly a creative exploration of the illusion effects that cheap and domestic technology can bring through my laptop (a laptop itself is cheap domestic technology!) inside a performative context. How to let the audience experience a moment of magic? and how to aesthetically assume the magical within reality? are the motivating questions behind every step I take further into this personal research. I have found that the main characteristics of how to achieve these moments of wonder have to do with elements of theater, vision-sound perception, and carefully hiding every trace of cables or electronics from the audience. Besides, magicians never reveal their tricks during the performances, otherwise the magic is gone!

How did I convey the above mentioned elements or how did I realized *Magical Reality* for my artistic work didn't happen after one night's thought. It is part of a continuous process, full of constant questioning, that gives meaning and personal expression to what I do and how I do it within my compositional and laptop-performance practice.

So before diving directly into literary and philosophical justification, I better want to share the way the concept gained form in me chronologically, without reading about it (I knew about *Magic Real-*

*ism*² of course, and read some of the authors concerned with the genre) or even thinking about it.

I first confess I wasn't marveled by theater until very recently because I felt either disappointment or lack of understanding when experiencing it in Mexico. I always liked reading plays, but to actually enjoy a live performance of a play wasn't common. I have to be grateful though, that I am married to a choreographer, and between assisting to contemporary dance performances (which are all-in-all part of a fantasy world, as opera is) we would also attend theater presentations. Back in 2008, Eugenio Barba³ was visiting Mexico City with his theater company and presented 'The great cities under the moon'⁴. Within the play there is a scene of a woman on some sort of imaginary canoe. This was the first time I was completely immersed in the theatrical fantasy. The canoe was also in my imagination and so I experienced, finally, the magic of theater. No further external side-effects of such an evanescent event, but a new passion and wonder for theater and its invitation for communal imagination and fantasy had been born inside me.

3 years later, in early 2011, another milestone came as part of a creative experience for a project with Amsterdam Chamber Opera. I had to arrange 'La voix humaine' by F. Poulenc for a modern setting, and in this opera for only one female character all the drama occurs in

² The Literary trend in Latin American writing in the mid 20th century.

³ Author and Theater Director, founder of Odin Teatret and Theater Anthropology.

⁴ Odin Theater, 2008.

the form of a phone call to the lover. When J. Cocteau wrote the play in 1930, telephones didn't work the way they do now, so after many meetings with theater-director Marcos Rabello, we concluded that a modern setting must consider the use of a mobile phone for the main character, plus a transformation of all the telephone-operator text references into signal-interruption situations. The idea of the mobile phone was extremely inspiring and I was convinced that it's symbolism and dramatic usage could go well beyond that of the visual prop in the singer's hand. In the early months of the arrangement, when developing the ideas for the electronics, it struck my mind that mobile phones are also integrated with speakers and have antennas capable of receiving FM radio signals.

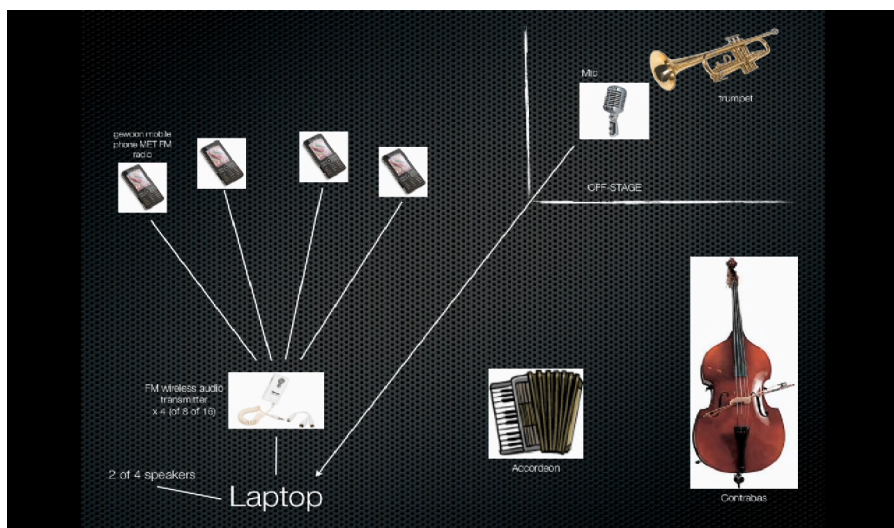


A Voz Humana. Photo from the premiere in Salvador Brazil, 2011

I then remembered my days back in Mexico when I was in the car with my brother and we wanted to listen to mp3s. We would have to buy a very, very cheap FM radio transmitter that could be connected to an mp3 player output (since old cars couldn't read mp3 files). The music playing out of the device would be transmitted as an FM radio signal in a specific frequency, in a short range (around 10m with no interference) and one would only have to tune the car's radio to match the frequency of the transmitter and... voila! the mp3 music from the ipod was suddenly playing through the car's speakers. With this in mind I realized that the sounds from the laptop could come out through mobile phones during the opera's performance.

Since I use a 6-channel output interface for my laptop performances, the arrangement finally compromised 2 main stereo outputs (the theater's speakers mirrored in monitors on stage) plus 4 independent channels distributed in 4 mobile phones hanging on the walls of the theater, near the audience. In my original idea, the audience could tune-in the frequency of their choice, from 4 different options given in the hand-program, and therefore anyone with a FM-radio capable mobile phone could stream music from the performance in real-time. Though the idea is still in my top-list of TO-DO projects, we only used 4 mobile phones during the performances for the sake of practicality.⁵

⁵ Letting the audience leave their phones on can cause interruptions if they receive calls or messages, and the production opted to avoid that risk, which has work-arounds but it simply made the production more complex.



From this project, apart from all the musical influence I gained from Poulenc's masterpiece and the challenging work (both arranging and composing new scenes, leading the ensemble at the same time the laptop is performed, organize all musical matters of the production...) I learned that wireless communication between my laptop and speakers was within my reach, both artistic, intellectual and economic. My quest in *wireless electronics* began.

That same year, I had to compose a piece for the 2011 November Music Festival. I was given total freedom for the piece, apart from a fixed duration range and the limitation of only using any one instrument. I chose harp so I could work with harpist Victoria Davies, one of the most reliable and talented musicians I know. This was my first 'important' commission, so I was more than motivated to make a strong personal statement of my work as a composer. I asked the

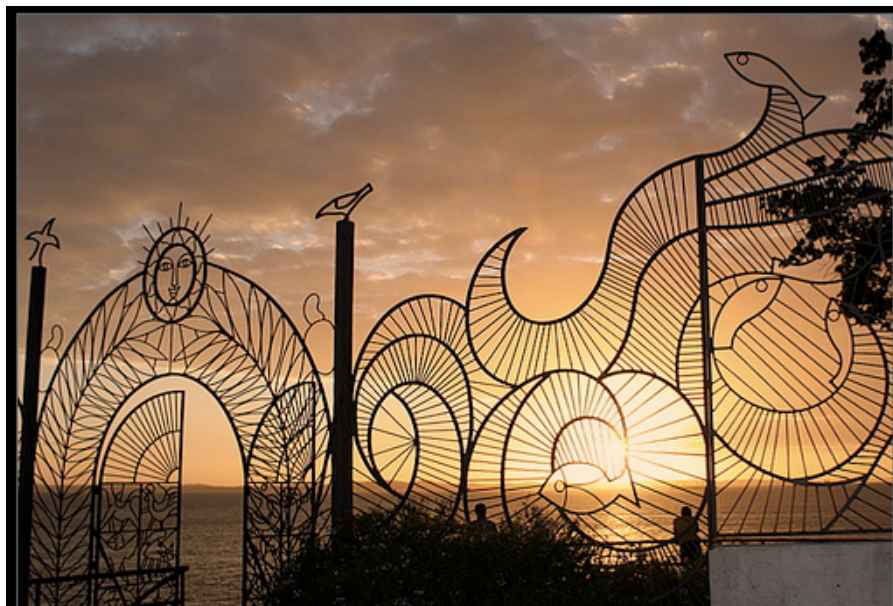
director of the Festival if I could include electronics, one of my specialties, and he initially said yes but after some weeks I received a mail that I must better avoid them because we wouldn't have technician or equipment in the hall, because that equipment was needed for the 'bigger' concert of the night. This was the perfect chance to make a statement. I *was* going to use electronics, but I was going to hide them from everyone. Even the director. That was the challenge, to use electronics but in a way no one could see it, and that it would need no equipment or support from the hall or the festival. Thanks to my experience in radio frequencies with the opera project earlier that year, I had a basic idea on how to avoid the use of cables, but the mobile-phone speakers proved to be too weak, so I started on a fascinating research on new and cheap domestic wireless technologies. To my surprise, there exists a wide market, by-product of the mobile-phone boom of our time, of wireless devices for transmitting data. I looked into the cheapest options of wireless speakers, with a good practical range (the 10m of the cheap FM radio transmitters was not enough, and they were too sensitive to interference) and I found that bluetooth technology was producing cheap stereo speakers for under 50 euro, with 30m range, good fidelity, and enough power to be heard the way I wanted.⁶

Once this technical issue was solved, I was confronted with the artistic question of why am I hiding the electronics? and how to give a

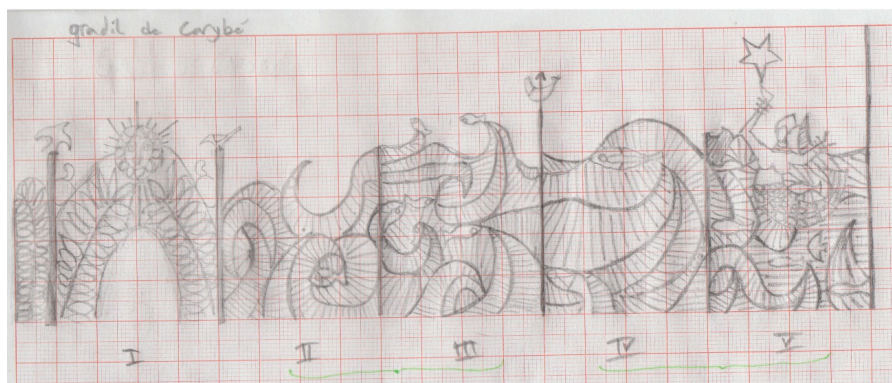
⁶ Sine this devices are meant for personal use, the expected power is always low, but just enough to work for the effect I needed. In musical terms, the expected power was of a **mezzoforte** of the harp.

personal statement of my style with this piece? That set me to think about myself as a person, and what would be the meaning of making music. The experiences I had lived up until then started to come together and I realized that when I enjoy performances the most is when I experience what I did with Barba's play back in 2008. I was sure that I would avoid an over-intellectual, complex-to-hear contemporary style, I was already bored with that and I felt, almost knew, that audiences, at least myself, was missing the sense of wonder in a music concert. Specially in a 'contemporary music' concert. Theater, plus a smart use of electronics was the key to bringing that wonder, that feeling that something unexpected and almost magical happened in a concert. Thus I became obsessed with the word *magic*. When thinking about me as an artist and my roots I couldn't avoid linking the fact that I am latin american and that *Magical Realism* is a literary style created in Latin America. There is something about our culture, even way back before europe and western lifestyle was imposed, that make people be very superstitious, blindly faithful, and yes, why not, believe in the magic of reality, the miracles of everyday life. I am not talking here about religious miracles (which always deserve headline news in Mexico) but those little moments of life where we are wondered, where reality became more mysterious and more beautiful. And when we believe. All these was going round my head for months, and then in the Brazil opera presentations I came across the work of Argentinian born plastic artist Carybé. Many parks and public spaces in Salvador Brazil are outlined by his ironwork, in ingenious and very personal fences. In literary *Magical Realism* there is no line that can be drawn between fan-

tasy and reality, they both co-exist in the literary reality. In the best works one is also able to take this magic for granted. The fence of Carybé for the Contemporary Art Museum in Salvador was a proof for me that *Magical Realism* was an ideal that could be taken beyond words. It was in a fence!



What seems to be a fence depicting only landscape, the sea, fishes and the sun, is given another meaning when we suddenly see a mermaid! That is bringing the fantasy, magical world, in co-existence with the 'real' world. I sketched the fence and that became the structure for the piece:

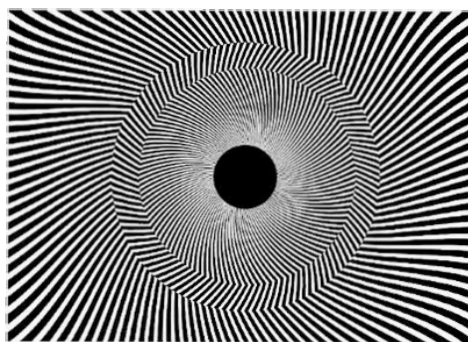


If we read the sketch from left to right we will notice that at the right end we find the mermaid, the magical element. So for the time structure of the music, we were to find the magical moment at the last part of the piece. This is exactly the point where *wireless hidden electronics* played their role. A 30 second role that was the most important moment of the piece. The hidden electronics, plus a coherent theatrical gesture from the performer gave the effect I was looking for: Victoria plays a *bisbigliando* on the harp but slowly starts separating her fingers and hands from the harp, she continues the finger action even when her hands are getting farer away from the harp and to the audience surprise there is still sound emanating from the harp, as if she was playing with invisible strings attached to her fingers.

In the end the piece proved to be one answer to a very conscious question I had in my mind: How can we express *Magical Realism* in Music? Thanks to this experience I could confirm that with two elements carefully developed: *theater* and *wireless electronics*, the per-

formative possibilities and sphere I wanted to have for my work was plausible and limitless. For obtaining the best results in the overall effect I teamed with a choreographer, my wife Cinthya Oyervides, who since this piece has been a side-walker in the aesthetic path of *Magic Reality*, a path of exploration and development of innovative music-theater, with the aid of domestic technologies, theater, and creativity.

Since then and up until now, I approach every project with the same artistic motivation: How to create and device dramatic illusions? In my work I want to highlight aspects about the perception of reality, in a way that can always be enjoyable and surprising for the audience. If the audiences, at least for a split second feel the wonder of a magical moment, a positive break of their expectations, or if I can get a smile from their faces, then I feel I have used my skills, my creativity, and my laptop, in a meaningful way.



In the following chapter we will take a closer look into how I further developed the ideas of *Magical Reality* in composition and laptop performance, through 3 different projects done in 2012.

CASE STUDIES

Maria

Maria was conceived, developed and performed for a joint project between the Conservatory and the Theater School of the AHK.⁷ During this project week I was teamed up with theater director Liliane Brakema and dramaturg Roos Euwe, under coaching of stage director and teacher Javier Lopez Piñon.⁸ The main objective of the project was to produce and present a ten minute opera inspired on poem no. 103 from the 'Cantigas de Santa Maria'. In this poem a monk prays the Virgin for a foretaste of paradise, but is then distracted by a birdsong. The monk listens attentively to the bird, and once it stops he goes back to the monastery to find everything changed. They find out he had been listening to the



date	location	time	
5/27/12	TONEELSCHUUR HAARLEM	15:00	een korte opera over de schoonheid van onderweg zijn

⁷ Amsterdamse Hogeschool voor de Kunsten.

⁸ Piñon, Javier, 2013.

birdsong for 300 years! and so the Virgin is praised for the miracle.

The poem was only the inspiration source, and we could do anything with it, so we as a creative team decided to find out which were the elements that we most liked in the text, and then use them in an abstract form to build our own story, our own narrative. For me this was intimately related to my pursuit of *Magical Reality*, and after several meetings with Liliane and Roos we found out that we were marveled about the *magical* in everyday life. In the case of the monk that was the birdsong, but for our context it could be anything that you suddenly pay attention to, to the point you are enchanted by it. In the end we decided to try to highlight the magical in the most ordinary thing we could think about, and living in Amsterdam, a bike popped up as first choice. So we would use a bike to symbolize what the bird symbolized in the poem, and after some more brainstorming we came to the idea of doing the opera about a young couple, a dutch man and a latin woman, and their symbolic pilgrimage on a bike.

My challenge, apart from the whole music composition, was how to make the bike a musical instrument, and not only that, but how to enchant with it and highlight it's magical potential. This is where my research in *wireless and hidden electronics* was going to come in handy. I would become the bike, I would perform the bike through my laptop in real-time processing and sampling of sound. This was the first time that I started to realize another possibility of laptop performance, that of the *hidden performer*, who is trans-bodied into an object on stage, in this case the bike. Though the audience might

not notice it, I am responsible for every sound aspect of the bike on stage in real-time. Within the dramaturgy of the piece we wanted to make apparent that towards the end the bike gains a life of it's own, or grows some sort of symbolic consciousness. Throughout the piece the bike becomes the channel of communication between the couple, and it becomes also an object filled with the 'memories' of the couple's lives, so in the end, when the couple grows apart in a climatic Hildegard von Bingen-inspired style, the bike is left standing alone, singing nostalgically a melisma on 'M-A-R-I-A', the name of the woman.



Last scene from Maria

On the technical aspect of this piece, I explored radio communication between my laptop and the bike but within a higher range, that of bluetooth technology. With a very low budget I achieved to put together a bluetooth USB transmitter with a range of 100m, which became very useful because it would give absolute freedom for

moving the bike around space and never losing the wireless link between the laptop and the bluetooth speakers which were hidden on the bike. On the back of the bike I also hid a very little clip microphone and a radio sender, so that the bike could also record sounds from the performers on stage. Thus, the wireless communication happened both ways: Audio from the laptop was played on through the bike, and sounds from the stage were recorded by the bike and sent to my laptop so I could process them and then send them back to the bike. Musically, the piece relies on the amount of predominance that the bike gets. In the beginning only very minimal sine-like tones are sporadically played electronically, most of the music comes from actual sounds of the bike or the male singer, or the whispering of the actress.



In this Aria, Harm Huson is singing directly into the hidden microphone

As the piece progresses the bike becomes more predominant in the music, having a first climax on an Aria where the male singer sings to the beloved and the bike records loops of the singing to build up a harmonic and textural accompaniment for the rest of the Aria. Towards the end, the bike ends 'singing' alone, a sort of Lamento for the bike.

Maria holds a very special place for me within my repertoire, not only because of the experiments I could carry out for understanding and developing more my laptop artistic approach, but also because of the team dynamic that was achieved. I collaborated with extremely talented people with whom I have established strong professional bonds. Thanks to *Maria* I re-confirmed my posture that effective music-theater is better achieved in a collaborative environment, and I was very happy that all the team members supported my artistic view and approach so that I felt a lot of freedom when composing and performing. If I am to criticize something about the project, is that we only performed a reduction of a potentially longer piece. We did an approximately 10min performance for the presentations we did in 2012, but we have enough material for at least a 30min mini-opera. Since the characteristic of this piece allows for it to be performed in any space, even on street or open air locations, I hope that for 2013+ we can further develop it into a longer version and perform it more times and hopefully in festival platforms. For a view of the score or a trailer of the piece please refer to my personal webpage.⁹

⁹ www.felipeignacio.info



Around springtime of 2012 all the harvest of a creative process that started almost 6 months before was taking the form of a music-theater piece which was to become my most performed piece until now. *Memento* was a collaborative project with choreographer-scenographer-and-dancer Cynthia Oyervides and flutist-mime Kata Szanyi. Although the creative process started even before *Maria*, the final coming together of elements and coherence came after

Maria was done, so I had some more experience into the *Magical Reality* approach I was researching, and I also had new questions to be explored in the dramatic-narrative aspect. By now I was very aware of the *hidden performer* concept, and I started to understand more it's meaning, mainly by relating it to puppet theater and giving it a lot of thought in the sense of trans-body already explained in Chapter 4. The theme and narrative of the piece, and the only scenographic object present on stage gave me the perfect platform to experiment on performing live electronics channeled through an inanimate object on

stage, to the point where the audience could really feel the ‘presence’ of that object in a conspicuous, but more importantly, dramatic way. That object was an old and small metallic box which represented a ‘memory’ box (hence the title of the piece: *Memento*) of the main character: an abstraction of a woman represented by Kata and extended by Cinthya. The original idea was to develop a piece about childhood, and through an intense and long process of improvisations and research we ended up using marbles, the box, and specific costumes in order to symbolize different dramatic elements or characteristics of the narrative. The music composition didn’t limit itself to the flute, but was extended to the metallic box, the movement and sound of the marbles and the movement itself of the performers. Everything was part of an organism and a unity. In that sense all three of us, the makers, were also part of a creative and performative unity to the point that we equally share the full credits of the piece.

The ideas of *Magical Reality* were expressed in various ways in this piece. I had, of course, thought of the box as ‘magically’ producing sounds and melodies symbolizing the memories of the main character¹⁰, but we decided to take it to the next level so we also aimed for a visual illusion of having a flutist with 4 arms, symbolizing two different states of the same person. It is interesting that at certain points of the piece it is difficult to distinguish who’s arms are really

¹⁰ The raw material for the piece were the first sound memories of Cinthya, Kata and myself: a crackling heater, footsteps of the father on grass, a hungarian lullaby sung by the mom, hushing fatherly sounds, a mexican children song sung by the father.

playing the flute, since all of them play it at some point, and the choreography and music was composed organically and taking the visual illusions into account all the time.

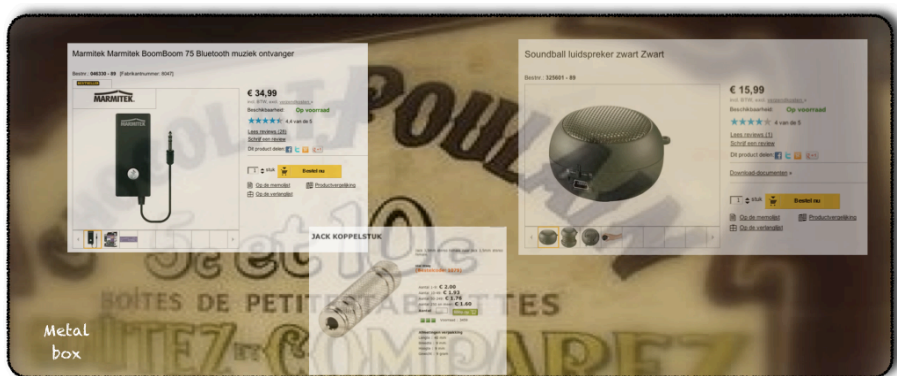
As for the 'metallic' box, which was lying just in front of the performers, I employed the same tricks of *wireless electronics*, also with bluetooth technology, but this time I was very aware of me being in a state of presence and trans-bodied performance. With this project I also started to become aware of the low budget limits and how interesting it was for me to develop illusions no matter the amount of money at hand. It became more of a creative challenge and a credo to always use extremely low budgets for the technical electronic aspects of the pieces, giving a strong emphasis to DIY methods.

The way the *magic* of the box was approached was again though the fact that the audience cannot see any cables on stage, nonetheless they gradually hear distant sounds coming from the small, metallic box at the center of the stage. At this point of the piece the performers are just very slowly moving, as snapshots of images. Eventually one can hear distant melodies¹¹ from the box (which is closed since the beginning of the performance) which grab Kata's attention, who turns to the box, walks towards it and slowly and shyly opens it. Since there is music coming from the box, the effect of hearing the same music with the closed box, and then how it opens up, and then hearing the music with the opened box is one of my favorite moments of the piece. The acoustic properties of the closed and opened

¹¹ All the electronic music was composed and performed with SuperCollider.

boxes, and the slow transition between these two states is something I savor every time. After this ‘box of memories’ is opened Kata grabs the upper joint of the flute which was inside the box and through a series of illusions we end up in front of a four-armed flutist. At this point the flute part begins, which ends with a reference to the marbles and a full realization and recovery of hidden childhood memories. For a video and more information of the piece please refer to my website or the appendix, since this handbook is mainly concerned with the laptop-electronic side of my work.

The total expenses for developing this illusion are displayed in the diagram below.¹² I was very happy to hear from the audience’s reactions that indeed the illusions were effective and that the ‘metallic box’ did played a dramatic role within the piece, with a powerful presence.



In the end this piece, although it proved to be very satisfactory in every sense, raised in me more questions and motivations about the

¹² It sums to 56.5 euros!

implications and applications of a *hidden performer*. This concept I was to explore in my latest piece (*The mill song*¹³) even more, and it is still in the back of my head all the time, motivating me and inspiring me to bring it's meaning and artistic potential way beyond anything I have done before. More on this will be explained in Chapter 8: The Future. This project was also so important and fulfilling that the same artistic trio is currently working on a new piece, to be premiered in mid-2013 with plans of formalizing the teamwork into a fully operational creative company focused on unified experimentation with music, theater, body and domestic, cheap technology.

Robot Theater 'Nacho Camacho'

This is one of the most difficult pieces I have ever performed in my life, only tied with the electronic arrangement I did for Amsterdam Chamber Opera 'O Castelo de Barba Azul' based on Bartok's opera 'Bluebeard's Castle'.

In order to perform *Robot Theater* I estimate a 2 month minimum preparation, with an optimal period of 3 months, intensive, to get the desired results. Yes, it is an extremely difficult piece, but if done correctly it can be, probably, my most powerful and enjoyable work until now, and the one which more nakedly represents me in front

¹³ For Clogs and hidden electronics. In collaboration with super musician and friend Sarah Jeffery and Cinthya Oyervides.

of an audience. The obvious question now, is why is it so difficult? Well, that is because it completely takes me out of my comfort zone.

Thanks to recorder-player and teacher Jorge Isaac and his unmatched understanding for music-theater (and electronics!) I was pushed to go beyond my own limits as a laptop performer. However, I took this push too freely and I sent myself so far from my comfort borders that in order to perform this piece I not only need very specific body preparation but also a very massive and conscious gathering of courage to step on the podium and do what I have to do. In this piece I am alone in the podium, I am not a hidden performer, and the illusions of *Magical Reality* are done only with my body movements and real-time control of the electronics, all tied together into a ‘fantastic’ narrative developed in conjunction with Cynthia Oyervides, my top body-movement advisor. Without her dramaturgical input I would just be playing fool in front of everyone.

Until this piece, my *wireless electronics* exploration was limited to audio input and output, so this time I wanted to experiment on wireless real-time *control* of the music. The first months of composing the piece I was only concerned with this technical aspect, which in the end was solved with a Nintendo Wii Controller linked wirelessly to my laptop and interpreted by an open source program (DarwiinRemote¹⁴) who in turn would inter-communicate with Su-

¹⁴ Intended as a program to interpret input from the controller to control certain things on the laptop, like the mouse pointer for example.

perCollider. SuperCollider was programmed in such a way that it would interpret the incoming messages from the Wii controller (DarwiinRemote functioned in fact only as a bridge between the two) into triggers and modulable parameters of synthesized sounds. Anyone familiar with Nintendo Wii knows that the controller works on movement, so for controlling the electronics I had to move around the controller in specific ways corresponding to how I programmed the sound response in SuperCollider. The challenge then became on how to make those movements part of a narrative or dramaturgy.



The Wii controller developed by gaming giant Nintendo is equipped with accelerometer and infrared sensors. This now cheap sensors are able to traduce movement of the controller into radio signals that can be interpreted in any way with bluetooth and a computer. One can buy this type of sensor device, new, for under 30 euro.

The movement's characteristics had already a very specific tendency, which was developed in parallel with the technical aspects of the piece. In essence, the character I become on stage is a robot, and I found on street performance art (through youtube) a perfect way to achieve that aim.

I've been looking into street art for some time now, and I am very fascinated by the creativity and wit I have seen in many of these sub-cultural urban movements. Thanks to internet and platforms like youtube I was able to research thoroughly over one of this 'underground' lifestyles. It is called *Popping*, an urban dance technique based on short spasms of the body, in coordination with the beat of the music, which gives the *illusion* of moving in slow motion frames, like a cyborg or robot, or animation of the 60's. Nowadays this technique is very popular in Hip-hop circles, but the way I use it has nothing to do with hip-hop. I use it as a way to make *live experimental electronics* an enjoyable experience for the audience.

I want to avoid describing the narrative in these pages, and better invite the reader to try to catch a live performance of the piece, which has become a trademark of my repertoire. It will suffice to say that it is a music-theater piece for solo laptop, where scenography, movement, narrative and live electronics come together to create a 10 minute experience which has received great remarks from the audience, but even better, it is a piece where I can hear people laugh while I am performing.

I want to quote part of the program of *Robot Theater 'Nacho Camacho'* as it appeared in it's premiere, followed by a couple of photos that might help get an idea of the piece:

"The relation between humans and machines has come to assume a central place within the social sciences. cyborg post-modernism revolves around the notion that the boundaries between humans and machines are becoming irretrievably blurred..."

Ralph Shroeder

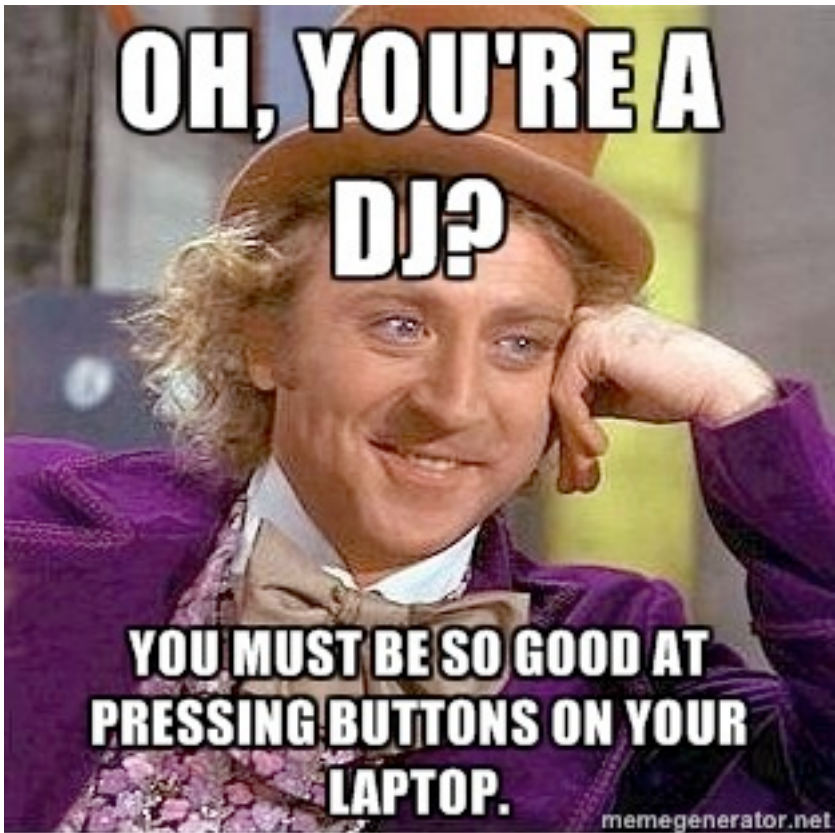
"...What happens when a nerdy, obsessed and solitary person stays in front of the computer all day long, for most part of his life?
What happens if this apparently lazy and unhealthy lifestyle causes some sort of electric-shock accident?

The life, death, and rebirth of Nacho Camacho might give us some answers..."





To end the chapter, I want make a special note about a common denominator in my work concerned with *Magical Reality*. In all of the cases the electronics sound source is *on location*. That means that the sound never comes from the big theater speakers, but actually from smaller hidden places: the bike, the metallic box, the speakers beside the red table in the example above. I have noticed that *on location* sound sources contribute to the illusion effect, not only because it breaks the expectation of the all too common super expensive and powerful speaker systems in theaters, but also because it emphasizes the space itself and the objects concerned in that space. The sounds and the music become part intrinsic to the theatrical space, and thus are part of the same reality: hence again *Magical Reality*.



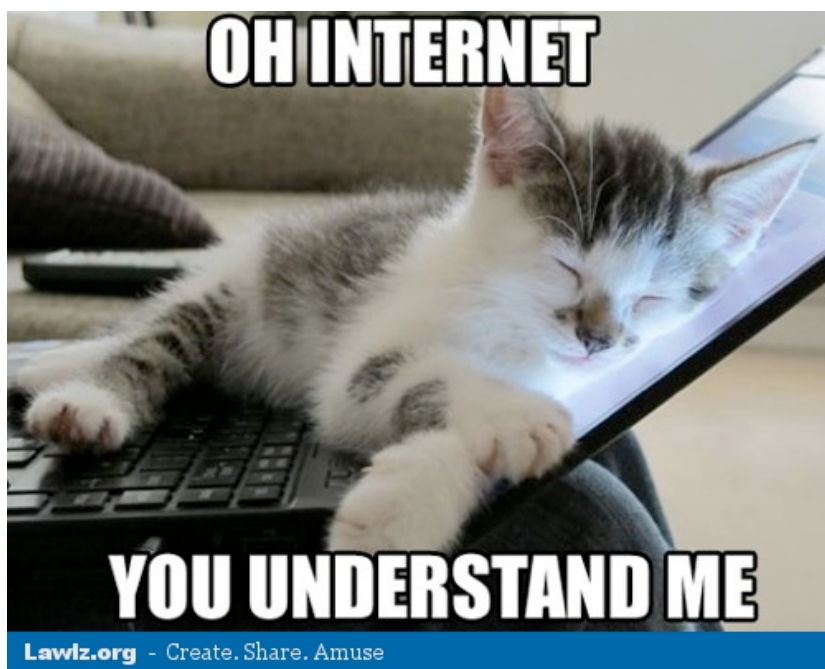
My original intention was to write a sort of ‘Manifesto’ for the computer musician in place for this chapter, so that it could clearly define the skills and aesthetic push behind us laptop artists. At the same time it would address the misconceptions of the laptop performer, just as Willy Wonka’s statement up here. Mr. Wonka is right about the computer musician being good (a virtuoso in some cases)

at pressing buttons in a laptop, but is wrong in saying that we are all DJ's. I am not a DJ and although I consider it artful in its own right it is very different from my approach as well as the approach of the other laptop artists analyzed in this handbook. But if you have reached this chapter without skipping any previous ones, this will be obvious for you. The whole handbook is a manifesto, no need to re-write everything again here. That is the reason why I better try to take a look into the future of computer musicianship, at least my own.

It will be very hard to predict the outcome of laptop music for the upcoming years, since technology moves at a rushing pace. However, a look into an optimal future sees the computer musician always aware of the technological changes, always curious about new possibilities and innovation, and always learning how to artistically incorporate what our time offers in the technological department. This doesn't mean that the computer musician will always incorporate cutting edge technology, on the contrary, it will also take a look into past technologies and re-interpret them in new expressive modes.

I already see a trend of laptop performance specialized departments in some conservatories, but I hope I will see more understanding and support from institutions, both cultural and educational, to this profile (specially in Mexico!), in the sense that new departments are founded and laboratories are organized to create better research environments for artistic technological research, for example robotics labs.

Even so, I am happy to predict that the computer musician of the future will not depend so much on educational institutions. The exchange of knowledge and information will be ready-made in the form of internet communities and forums, so the technical skills to develop projects will be as accessible as ever. Although there is a war on the internet right now, and it is still difficult to predict the outcome of censorship and information control in the near future, I am positive that creative minds will always stand against crisis and boundaries, and find workarounds for the benefit of knowledge, information, and communication. I am completely aware that I have developed many of my skills (and continue developing them) because of this communication and shared knowledge.



The technological future is promising us quantum computers, nano-technology, cyborg beings and more efficient Artificial Intelligence programs. But those are technologies in it's infancy and though I would love to start exploring them they are limited to an elite and to specialized institutions, just like transistor-digital computers were in the mid 20th century. Thus I see myself in the future exploring the technologies that are most accessible and have become domestic, just as I have been doing until now, but my intention is to take it to the next level of artistry. Specially the idea of modern puppet music-theater, which if I am able to find an optimal environment for development, I will start incorporating wireless, real-time robotics. Until now I have been performing live electronics in a trans-bodied manner only with sound, the future invites me to extend the control to movement.



A look into the future also means trying to predict the criticisms or questions that this handbook might arise. I can think of two:

Cannot music alone already create 'magical' experiences? and why focus on DIY methods and low budgets for the development of electronics?



Music listening alone sure can be a *magical* experience on it's own, in a figurative sense. However, for my intentions and the effects I am pursuing music has to be understood as more than a sonic event. Many studies have proved that there is intense brain activity when listening to music, that we do not only experience music with our ears. There are many factors always present when listening to music, including our thoughts, our memory, our visual cues, and in general all the sensorial stimuli around us. Not even in the cases where electronic composers such as Francisco Lopez¹⁵ provide blindfolds for the audience one can detach hearing from the rest of our perception

¹⁵ Spanish composer and sound artist born in 1964.

system. There are things about the mind and the senses that we will never isolate from the music experience, so why not take them into account? Emerson even points out:

"The state of readiness to perceive sound and music requires my ear/brain to be in an ultra-attentive mode which is (for me) only possible when all senses are on full alert and active".¹⁶

Apart from these arguments, I always find a collaboration with the visual aspects of a performance a more solid method to create the illusions and *magical* effects I am normally looking for. As in Tara X's works, my works are also to be understood as experiences, as environments, and one cannot only experience with the ears.

About the low budgets for my projects there are many factors lying behind this credo. As a main component I find the inspiration of my background, which is being Mexican. I come from a country where the word 'crisis' is in everyday life, and we are used to find creative ways of overcoming the limitations and obstacles that we face in the cultural sphere.

I take as an example my uncle Enrique Alcaraz, who inspired me since childhood to take things into my own capacities and simply do them. He is trained as a geologist but he can fix cars and electronic equipment as any professional could! When people are faced with a lack of money to access some services the creative Mexicans are experts in developing self-service, Do-It-Yourself approaches. This is

¹⁶ Emerson, 2007.

not necessarily legal, as in the case for example, of millions of houses 'stealing' cable-tv signals using wires, special hardware and self-planned circuitry, but I simply cannot deny the amount of creativity shown at such adverse conditions. I grew up in this culture so I feel every money limitation more as a creative challenge. In this sense I have kept all my electronic projects within a technical budget of under 100 euros. This is also a reason why I feel sometimes so attracted to street culture, because it represents a creative cultural group outside of the institutional grip and the systematic limitations of money. This of course doesn't mean that money isn't important, it is energetically and symbolically very important, and the computer musician should take it into consideration for the future, but the amount of money will never have to do anything with the creative possibilities of using technology in productions.



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Online Appendix

- <http://felipeignacio.info/handbook/appendix.html>

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I devote this last section to pay tribute to all the people and institutions that have provided me in various forms either support or understanding for what I do and for my passion for music, the laptop, electronics, robots, theater and opera.

This handbook had not been possible if not for the generous input by THE SWEELINCK FOUNDATION, they supported me with a study fund in order to be able to pay part of my last year of master study. Without their support I simply wouldn't be here in the Netherlands finishing my studies and doing what I love, since Mexican cultural funds have never cared to show any interest for my work. I am very grateful to this institution and the people behind it and so this handbook belongs to them as much as it belongs to me or the other important people around me.

Without Cinthya Oyervides many of my projects would be non sense and lack a strong theatrical platform, she is not only a source of inspiration but a co-worker and a lover and a wife, she has the patience to deal and understand the numerous times I rather stay in front of my laptop than doing something else. Marcos Rabello has been one of the most enthusiastic supporters of my work in the professional world, and without his invitation to be part of Amsterdam Chamber Opera I would have never discovered the fulfillment of opera. Thanks to him I have been able to employ my laptop in ways

I could only dream of when I was in Mexico and I always feel more than inspired to continue a professional and friends relationship with him. Arnaud Mulder, also part of Amsterdam Chamber Opera, is my number one critic and an incredible source of generosity and support, in every sense. My sister Ana Lilia Noriega is always helping me out to edit images and posters, flyers or programs, she is always happy to help and her talent always brings an extra dimension to my work. My Mom and my Dad who have supported me in every way they possibly can, they deserve my unconditional love. My brother Pablo who inspires me to go on and laugh and be ironic and never lose my sense of humor or the love of life.

I also want to thank Artemio for being such a mysterious being, I always wonder what goes on in his head, and Numerito 3 my secret muse. To My uncle Mario Alcaraz and his family who represent the encouragement to go on with my passion even though the conditions are sometimes adverse. To all my friends from the conservatory (you know who you are) who have either been influential on my work and aesthetics or are keen to collaborate with me. To Anthony Dunstan, with whom I have great plans for our musical and friendship future. To Willem Jeths for being my composition teacher all this years and becoming also a friend, to Jorrit Tamminga for his expertise and his attitude of sharing his knowledge, and for being just really smart. To Anne Veinberg and Anna Stegmann because they believe in my laptop performance and a chamber trio idea is getting to it's boiling point. To Kata is a terrific multi-dimensional

musician always supporting my work, we will continue collaborating and discovering together with Cinthya!

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I could go on and on so I better stop, but if I forget someone it is because of the deadline, or because I am too distracted and emotional to be able to think right. So if you are that person, Thank You.

Felipe Ignacio Noriega

31st December 2012