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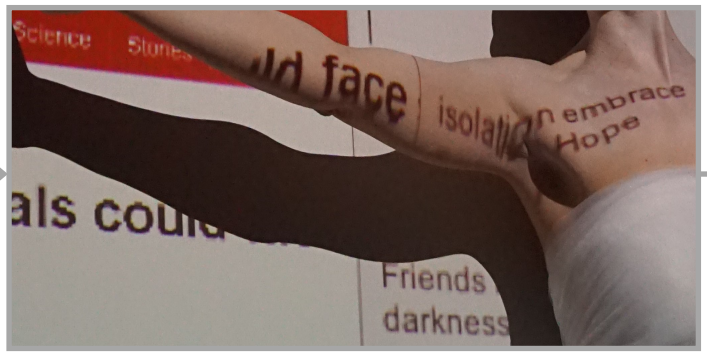
The Performing Engineer

Towards a Poor Interactive Multimedia Theater

A study on Samuel Beckett's "Happy Days"



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Your acting will not be good until it is only yours.
That's true of music, acting, anything creative.
You work until finally nobody is acting like you.

Sanford Meisner

Abstract

The Performing Engineer

Towards a Poor Interactive Multimedia Theater

A study on Samuel Beckett's "Happy Days"

This master thesis questions how new technologies can be smoothly incorporated into an interactive multimedia performance based on S. Beckett's theatrical play *Happy Days*. It elaborates, through a specific methodology, the whole path until the final concept, which is a result of successive experimentations. It deals with all the required elements of the creative procedure: acting, dramaturgy, aesthetics, direction, scenography, sound design, digital media etc, because it handles the performance as an individual artistic statement. The performer is a creator of an artwork in which the spectator also becomes a creator via interactivity. The final project is an interactive live streaming performance on social media, as a reflection of the historical Coronavirus event which inevitably became a "companion" during this research.

Résumé

L'Ingénieur-Acteur

Vers un Théâtre Pauvre Multimédia Interactif

Une étude sur les «Oh les Beaux Jours» de Samuel Beckett

Ce mémoire se demande comment les nouvelles technologies peuvent être intégrées en douceur dans une performance multimédia interactive basée sur la pièce de théâtre *Oh les Beaux Jours* de S. Beckett. Il élabore, à travers une méthodologie spécifique, l'ensemble du chemin jusqu'au concept final, qui est le résultat d'expérimentations successives. Il traite de tous les éléments requis de la procédure créative: jeu d'acteur, dramaturgie, esthétique, mise en scène, scénographie, conception sonore, médias numériques etc., car il traite la performance comme une déclaration artistique individuelle. L'interprète est créateur d'une œuvre dans laquelle le spectateur devient également créateur via l'interactivité. Le projet final est une performance interactive de streaming en direct sur les réseaux sociaux, en tant que reflet de l'événement historique du Coronavirus qui est inévitablement devenu un "compagnon" au cours de cette recherche.

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Introduction

Although new media are omnipresent in our lives and many artists have incorporated them in theater, a big amount of theater artists is still reluctant to use them as they feel new technologies could degrade the art of theater and overshadow the performers. It is true that badly designed multimedia performances have occurred as they might have used new media as a tool and not as an important component of the creative process. I believe that digital media can offer great possibilities to theater, provided they are smoothly incorporated into a performance. This means, that they follow the needs of the play and their role is active in the designing procedure.

This study is organized in two main parts. The first part is consisted of a proposal of a methodology in designing an interactive multimedia theater, acting approaches and the discussion of aesthetics in multimedia theater and in Beckett's artwork. Examples of previous projects and artists will also be mentioned. The second part is an application of the first in a study of S. Beckett's Happy Days. It consists of a series of experiments mainly with digital technologies (Unity, SuperCollider, Arduino, Mocap etc) that lead to the final interactive multimedia live streaming performance *Happy 365*.

PART I: Theories and reflections

In this part basic notions will be discussed, thoughts will be elaborated and existing examples will be presented.

I.A. The Performing Engineer

I.A.1. Inside an Engineer's Mind

I will probably start in an unconventional way as I will try to explain something that has not been presented yet. It will be a question on the project I created that will be described at the second part of this book. You do not need to go read it now. I just invite to you to follow my personal path.

What is inside an engineer's mind? That was the basic question that came to my mind, after having completed the practical part of my project. I took a moment and tried to understand what has lead me construct the whole performing network. What was my unconscious approach while creating this system of acting and digital media?

I have been performing as an actress for more than fifteen years, so for sure my creativity is exercised and I have also learned a lot about directing, but I was convinced that something else was also responsible for my approach. Then I thought it might have been my great interest in music that urged me to create the musical environment that embraced the whole performance, but still I could not find total relativity to this project. Lastly, I said to myself: It must have been Samuel Beckett! He is so inspirational!

Of course the answer lies between all these factors, but there is also a very important one that I tend to forget, even ignore sometimes: my studies in civil engineering. I have always been thinking that I lost precious "artistic" time during all these years, but finally - due to this research I can say to myself that those five years of studying civil engineering was a Mind study, and speaking in musical terms, an "*Etude de l' esprit".*

So, what is so special about Engineers? Well, engineers are problem solvers. But it is not merely about engineering. It is about human ability to create changes through problem solving. *"To be human is to be an engineer"* (Koen, 2003). Since the very beginning of history, people tried to find solutions to everyday problems: How will I cut this trunk? How will I create fire? How will I build a safe house? How will I go to the moon? Ok, the last one might not be an everyday problem for an average person, but it is an everyday question for engineers in this field. So, people throughout centuries have been trying to find solutions, so as to facilitate their quality of life. And they have succeeded. Thus, the engineering method has been proven in practice that it is efficient. But what is the definition of this method? Billy Vaughn Koen defines the Engineering Method as *"the strategy for causing the best change in a poorly understood situation within the available resources"* (Koen, 2003)

and suggests that a *"Universal Method"* (Koen, 2003) of problem solving for all people does exist and should be based on the engineering method, because of its proven efficiency and because of its intrinsic existence in human beings.

But how can this *Universal Method* be approached? According to Koen, the solution to any problem can be made through *successive approximations of the question "What do I do"* (Koen, 2003)? He claims that every answer to this fundamental question is a *"heuristic"*. A *heuristic* is *"anything that provides a plausible direction in the solution of a problem, but is in the final analysis unjustified, incapable of justification and potentially fallible"* (Koen, 2003). He also defines the well known expression *"state-of-the-art"* as *"a specific set of heuristics valid at a well-defined time"* (Koen, 2003) and suggests that *"the state-of-the-art of an engineer could also be considered as his privileged point of view"* (Koen, 2003). Finally he concludes that the *Universal Method* of problem solving - no matter if you are an engineer, a teacher, a doctor, a cook, an artist etc, should consist of a simple sentence: *Use heuristics*! (Koen, 2003)

This statement may seem too general and probably "non-methodological", but if we take a closer look and keep in mind Koen's advice that we should *define the heuristic for ourselves by successive approximations (*Koen, 2003), we understand that it is a dynamic methodology that keeps changing over time through **constant evaluations**, that is, in my point of view, the key element of self-improvement and as a result of personal and social evolution. Experimenting, observing, giving feedback, making errors, admitting errors, suggesting new solutions or making amendments and so on is the best way to evolve and gain experience.

To better illustrate what a *heuristic* may be, we will examine an example of a very basic *heuristic* in engineering design:

"Heuristic: Use feedback to stabilize engineering design" (Koen, 2003)

Even from this first example, a widely used word, that most of us are very familiar with, emerged: **feedback**. A very basic model of engineering design is the following *flow diagram*:

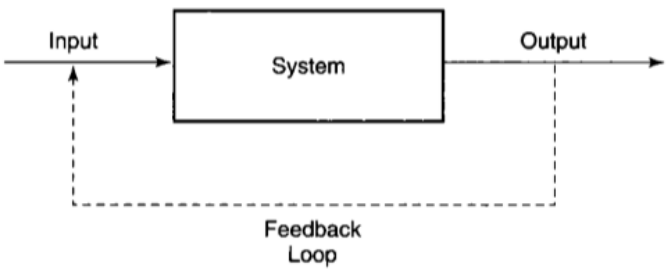


Figure 1 Koen B.V., 2003, Discussion of the Method (figure 23, page 78)

"*Feedback is the arrangement of any system, whether electrical, mechanical, or biological, such that the output affects the input"* (Koen, 2003). A very simple example of this is the human metabolic system. The input is the food we give it and the output the energy we gain. Once our energy falls, we understand our metabolic system needs food and we go eat. If we do not take feedback from the output (thus do not observe our levels of energy), and we do not give food to our system when needed, then our system will destabilize, in other words it will not work properly. It is therefore understood that a lack of a feedback loop can only lead to the death of the system. Fortunately, in the aforementioned example, the feedback loop is the automatic signal of hunger sense sent to our brain, therefore we do not need to continuously observe and calculate our levels of energy.

Many more examples of what a *heuristic* can be are given by Koen. I will mention here some that are most appealing to me:

"Heuristic: Always make the minimum decision

Heuristic: Always give an answer

Heuristic: Break complex problems into smaller, more manageable pieces

Heuristic: Always give yourself a chance to retreat

Heuristic: Design within a specific time frame

Heuristic: Engineering is trial and error

Heuristic: Engineering is a problem-solving, goal-directed and needs-fulfillment activity" (Koen,2003). And a last one that is linked to the claim that *all is heuristic* (Koen, 2003) and to the power of uncertainty and doubt:

"Heuristic: (1) Let the opponent speak first; (2) say in a gentle voice, "That's an interesting heuristic"; and (3) observe a long silent pause" (Koen, 2003).

This last one, according to my view, plays a major role in the feedback process that is the main *heuristic.*

To reach a conclusion, how could all these be applied to an artistic project?

Answer: If I want to create an artistic project, I seek the method of the artist that can be no other than: **Use artistic heuristics**. In other words, I should always raise the question *"What do I do?"* and through successive approximations give answers that make me create what I desire within the available resources.

I.A.2. The Art of Acting

What is acting? Many great teachers have tried to answer this question and therefore have created their own acting techniques. The purpose of this book is not to present and analyze them, but mostly to explain my personal approach according to my acting studies and experience.

In general, it could be said that acting methods could be classified in two main categories. "*Methods of realistic approach and methods of non-realistic approach"* (Tsolakidis, 2019) - the second category is also known as "physical theater". Through the realistic approach actors try to create truly convincing human characters and play with "naturalness". The first great teacher of this approach is Konstantin Stanislavski. Some teachers that continued, evolved or contributed to his method are: Boleslawski-Ouspenskaïa, Evgueni Vakhtangon, Michael Chechov, Lee Strasberg, Stella Adler, Sanford Meisner, Uta Hagen, David Mamet and Suzan Batson. On the other hand, in methods of non-realistic approach actors search beyond realism and try to express creativity through hard training and profound research on the physical and mental power of their body and voice. The actors do not try to play a situation or action by investigating the human qualities of their roles, but rather try to create a corporal and/or vocal personal synthesis and finally a stage ensemble. Consequently, they use their bodies and voices in a more unconventional way, creating either a) poetic/abstract figures or b) descriptive ones, in case of mime. Main teachers of both basic subcategories are respectively a) Bertolt Brecht, Augusto Boal, Antonin Artaud, Jerzy Grotowski, Eugenio Barba, Peter Brook, Tadashi Suzuki, Laban-Malmgren, Theodoros Terzopoulos and b) Vsevolod Meyerhold, Etienne Decroux, Jacques-Lecoq. Personally, I am mostly influenced by Meisner's Technique, Grotowki's Method and lately the Method of Theodoros Terzopoulos.

Sanford Meisner was Stanislavski's student; therefore his acting technique is basically an evolution of Stanislavki's method. Meisner was focused on the continuous communication with one's partner and the "Moment to Moment Acting", so that the actor truly "is" than "show he/she is". "Acting is the ability to live truthfully under the given imaginary circumstances" (Sanford Meisner's quote). According to him, spontaneous realistic human behavior can only be provoked through profound communication between two actors. This can be achieved through intense observation of one's partner and continuous moment to moment action-reaction connection. I have been training on this technique many years and I apply it even in my personal life, as it has revealed me the

power of sincere listening and communication and that human truly exists only through their connection to the others. In other words, the others are more important than the egocentric self.

Figure 2 Sanford Meisner asking his students "What is the basis of the pinch and ouch?" https://www.youtube.com/watch?v=kBszDobYD8w

Grotowski's method is a disciplined, personal research whose aim is to overcome and defeat all the obstacles one's organism (physical and psychological) raises during their creative, self-disclosure process. It is a "via negativa" (Grotowski, 1968): not a collection of techniques, but a deletion of obstacles. This can be achieved through many years of personal work and series of physical and vocal exercises. The result can be the total liberation of the actor's inner impulse and the absolute offer of oneself to the audience as a gift. Grotowski believed that this procedure is really unique for every actor that is why his workshops were very personalized and urged his students to find their very personal method. Not every exercise is for everyone as every person has their very personal psychosomatic obstacles. Apart from the whole approach, that I find it beautifully generous and self-revealing, what I also like in Grotowski's method is that he likened actors to musicians saying that actors also need a score. *"A musician's score consists of notes. Theater is contact. The actor's score consists of the elements of this human connection, of the elements of the take and give"* (Grotowski, 1968). He also referred widely to the notion of rhythm - an element that I am very connected with. I have not trained my body to the extent that his method reached, but I strongly believe in the continuous, disciplined, personal "via negativa" research and in the total giving of oneself to the audience.

Figure 3 Grotowski's training in Laboratory Theater, 1972,
https://www.youtube.com/watch?v=dRyLLTvs00c&t=171s
https://www.youtube.com/watch?v=C1lrAHA45Pc

Lastly, the method of Theodoros Terzopoulos (Terzopoulos, 2014) that I was recently trained in, has many common points with Grotowski's method. The main difference is that Terzopoulos' training (physical and vocal) is based on the breathing function, influenced form Suzuki's method. No physical exercise is performed without the coordinated, energetic inhalation and exhalation provoked by the correct use of the diaphragm. The better the inflow and outflow of the air, the greater the inner impulse (common point with Grotowski). His training is a very demanding procedure that requires both physical and mental strength (as Grotowski's method), but the result can be really rewarding. Personally, this training helped me understand in practice the importance of breath handling and its transformative effect on an actor's performance and more generally on a human's life.

All things considered, my personal acting approach is a mixture of realistic and non-realistic methods. The aesthetic result of my performances depends on the desired result of the ensemble I am part of. By saying aesthetic result, I mean whether I turn to be on stage or on screen a completely natural human being or a poetically abstract figure or something in between. No matter the case, I always try, equally, to have a functional breathing system (thus inner energy), to communicate with my partners on stage (either behaviorally or "corpovocally") and to offer to the audience my inner world with generosity.

I.A.3. The Performing Engineer's Technique

The Performing Engineer's Technique is a technique for an actor/actress who wants to create his/her own artistic project. Thus, he/she performs in the artistic environment he/she creates. As a result the actor is not just a part of a director's vision, but the creator of a personal artistic statement. Consequently, the final project can be viewed as an individual artwork that includes acting as a basic element. It is like creating a poem (an image/thought one wants to share via words), whose lyrics include the performing action:

May anyone talk about
(silence and eyes that blink)
The blue? (teeth sound)
(silence and eyes staring until tears appear)

This poem becomes a performance poem. But a performance requires a space, an environment where the character of the poem is situated (scenography) and finally a medium through which the whole poem would be presented to the audience (direction). A second, more completed version of the performance poem would be:

<u>360 film poem: A cup of sugar</u>

(a naked human figure is inside a cup of tea)

Human figure: May anyone talk about (silence and eyes that blink)
the blue? (teeth sound)
(silence and eyes staring until tears appear)
(sound of falling teardrops in the cup until the cup overflows - when the first teardrop falls out of the cup the scene turns to black)
-black-
-the performer who was playing the human figure, takes off the VR headset from the spectator and asks him if he would like sugar in his cup of tea in front of him-

Finally, the whole poem transformed into an interactive multimedia performance.

Therefore, in such situations where the artist creates a composite artwork that involves acting/performing, the Performing Engineer's Technique could be used, that means,

as elaborated in chapter I.A.1 the use of artistic heuristics. In other words, the performing engineer should always ask the question *"What do I do?"* and through successive approximations reach his/her goal within the available resources. Answers to this question should be given from all the required perspectives. For example:

- What do I do as an actor? → refers to which acting technique I should use
- What do I do as a digital artist? → refers to which digital medium I should use
- What do I do as a dramaturgist? → refers to finding out the key points of my performance
- etc

An example of this will be presented in the second part of the book.

I.B. Interactive Multimedia Theater

I.B.1.Towards a Poor Interactive Multimedia Theater

Undeniably, we are living the era of new media. New technology is everywhere. In our everyday communication with people, in our everyday life's facilitation, in our everyday challenge to follow technology's speed and learn something new. Thus, how could we ignore the inevitable potential presence of new media in the arts - and more specifically for the sake of this research in *the art of theater*, which is strongly linked to humans and their interaction with their surroundings? No matter how strange or even repulsive for some great, old theatrical practitioners may seem, a new genre of performance has emerged, the so-called *digital performance*. As Tim Etchells says *"Technology will move in and speak through you, like it or not. Best not to ignore"* (Dixon, 2007).

According to Steven Dixon and his book *Digital Performance: A History of New Media in Theater, Dance, Performance Art and Installation*:

"We define the term ***"digital performance"*** *broadly to include all performance works where computer technologies play a key role rather than a subsidiary one in content, techniques, aesthetics, or delivery forms.*
This includes live theater, dance, and performance art that incorporates projections that have been digitally created or manipulated; robotic and virtual reality performances; installations and theatrical works that use computer sensing/activating equipment or telematic techniques; and performative works and activities that are accessed through the computer screen, including cybertheater events, MUDs, MOOs, and virtual worlds, computer games, CD-ROMs, and performative net.art works" (Dixon, 2007).

And the "start button" for an endless controversy on what is theater, between lovers of pure theater and the ones experimenting with the new media, has just been pressed. Followers of Jerzy Grotowski's *Poor Theater*, a notion that Grotowski introduced in his book *Towards a Poor Theater* that was published in 1968*,* believe that theater can exist without makeup, scenography, costumes, lights, sound effects etc., because their resulting effects can be produced, in a *poor way,* only by the actor's body and voice, agreeing with Grotowski that this is by far the most theatrical way to represent an actor's transformation. As Richard H. Palmer observes in his book *Technology and the Playright:*

"Grotowski was an outspoken antagonist to the incorporation of increased technology in the theater… [and] provides theoretical legitimacy to late twentieth-century resistance to theater's developing technology" (Dixon, 2007).

Just to better understand the origin of Grotowski's basic points of concern, but also to briefly present the evolvement of digital performance, it is worth mentioning that Grotowski (1933-1999) was born and acted during the first experimentation period of Multimedia Theater (1911-1959), when the first attempts of incorporating film projection in theater had been made. Loïe Fuller was an American dancer and director that was the first to project film on her diaphanous robes in a theatrical performance (1911). Furthermore, Robert Edmond Jones, one of America's leading theater designers, introduced a new theatrical form that was a fusion of theater and cinema via a great number of lectures, papers and books that are still considered as the first major theories of multimedia theater. Some of them are entitled as: the *Theater of the Future* (1941), the *Theory of Modern Production* (1929), *The Dramatic Imagination* (1941), the *Curious and Profitable* (1941). In 1958 the founding of the theatrical company *Laterna Magika* in Czechoslovakia by Joseph and Alfred Radok, expanded the research on the coexistence of film and theater in seeking to balance the aesthetic and dramatic functions of the two forms. Although video shooting became portable in the mid 1960s, the expensive video-editing equipment became more affordable in the 1970s and so the video was finally able to find its place in live performances for the next decade. But, it was not until the *digital revolution* of the 1990s, that digital performance activity proliferated due to easier access to computer technologies, because of the introduction of affordable hardware, "user-friendly" software, digital cameras, the PC and the establishment of the World Wide Web, the so-called Internet (Dixon, 2007).

Therefore, we can now understand that when Grotowski published his book, was in the middle of a changing period for theater and he was probably really skeptical about what would follow. In his book, he states that theater will always remain technically inferior to pre-recorded types of performance (e.g. film, television), thus it should realize its limitations and concentrate on its unique element that differentiates it from them that can be no other than: *the actor-spectator relationship of perpetual, direct, 'live' communion" […].* He also defines theater as *"something that takes place between the spectator and the actor",* (Grotowski, 1968). Consequently, the two basic pylons his research was based on were the training of the actor and the spectator-actor relationship, totally rejecting the external materialistic elements and borrowed mechanisms of the *synthetic* or *contemporary* or *rich,* as he called it, theater- *rich in flaws* (Grotowski, 1968).

As far as the first pylon is concerned, the training of the actors was indeed very demanding and definitely anthropocentric, trying to explore the limits of physical and mental human abilities. But, if we take a closer look at his sayings we will see that he was not as dogmatic as he may seem. He states in his book addressing to actors: "*Do not imagine that makeup is bad. Simply, think how you could transform without its help. But when you have to use makeup, do it. If you have really studied the changes that you can achieve without the use of makeup, you would be more expressive when you use it and you will have the ability to overcome all technical tricks"* (Grotowski, 1968). Consequently, we can assume that in fact his basic concern was to ensure external elements or technology would never be used as a tool for an actor's performance, so as to substitute their acting abilities and finally hinder their way to their *holistic act* as *holy actors* (Grotowski, 1968).

Regarding the second pylon of his research, the spectator-actor relationship, he had refused the common setup stage-audience and, according to each play's specific dramaturgical demands, designed a different one. The actors could play among the spectators ignoring them, be in direct contact with them, give spectators a passive role, incorporate them in the action design, make them feel the pressure of space, separate themselves from the audience with a high fence making spectators watching them from above, they even used specials buildings as a specific location of the play-what we would call today site-specific performances.

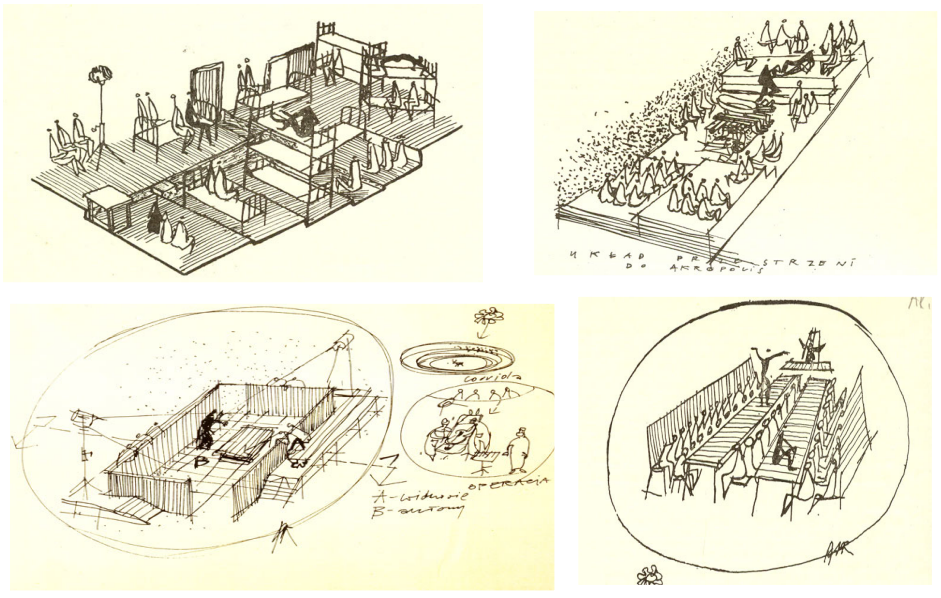


Figure 4 Gurawski's sketches for Grotowski's Kordian(upleft), Akropolis(upright), The Constant Prince(downleft), Dr.Faustus(downright)

https://grotowski.net/en/media/galleries/jerzy-gurawski-projects-1962-1965

Grotowski was and still remains a genius in his art, who approached theater through the lens of a true architect. So, what he was really trying to do? Observing his work as shown in archives and as presented with his own words in his book, he was trying to change the spectators' view, to literally communicate with them, to give them a specific role in the performance, to treat them as a necessary component of the performance, to transform them into a silent performer, to create them certain feelings, to - if we want to call it in today's expressions: make their experience more immersive. Catherine Bouko in her paper *Interactivity and immersion in a media-based performance* concludes stating that:

"Immersive theater puts the immersant at the very heart of the action. From a sensory point of view, this can be conveyed by stimulating environmental sensations. They are linked to the story and become an essential part of the imaginary world. The central role which is given to the immersant in the work, combined with plays aimed at one participant at a time, does not necessarily mean that he benefits from a lot of room to manoeuvre. Depending on the model, the level of interactivity can be named navigation, selective interactivity or internal/exploratory interactivity. Even when immersive theater allows the participant to experience auto-reflexive dramaturgy, his personal actions do not define how the action plays out. The wavering dramaturgy of dreams and sensorial disturbance effectively alternates with the key primitives which ensure that the action progresses as it should. Moreover, the dramaturgy of anxiety is better suited to inhibiting the participant than to encouraging proactive behavior. The participant himself limits the different forms of interactivity" (Bouko, 2014).

Grotowski in his desire to constantly research and expand the spectator-actor relationship had exhaustively experimented with the placement of the spectator inside the scenography. Still, he never changed his basic model. He always kept the spectator placed in a seat. What if the spectator had the possibility to change their perspective during the performance? What if the spectator had the possibility to navigate freely in the scenography-installation? What if the spectator could come and go whenever they wanted? What if, finally, there was a digital medium in between them (like the fences he had used), which enhanced their live experience? As he himself had said: *"… theater, with the completeness of its research, always seemed to me as a space of challenge. It has the ability to challenge its own nature, as well as its audience, by violating imposed standards of action, feelings and judgment –*

shaking them more, because they are expressed through the breath, the body and the deeper impulse of the human entity…"(Grotowski, 1968).

To sum up, addressing to all lovers of pure theater - myself included, I propose to hark the existing high-tech reality, embrace new technologies, reconcile with their coexistence with art and take the thrilling opportunity to continue Grotowski's and all his continuators' research on theater by working towards a poor interactive multimedia theater. This means towards a theater, that depending always on the dramaturgical needs of each play, makes good use of new technologies in order to thoroughly explore the spectator-actor relationship, provided that the actor's personal and stage technique will always be the core of the art of theater.

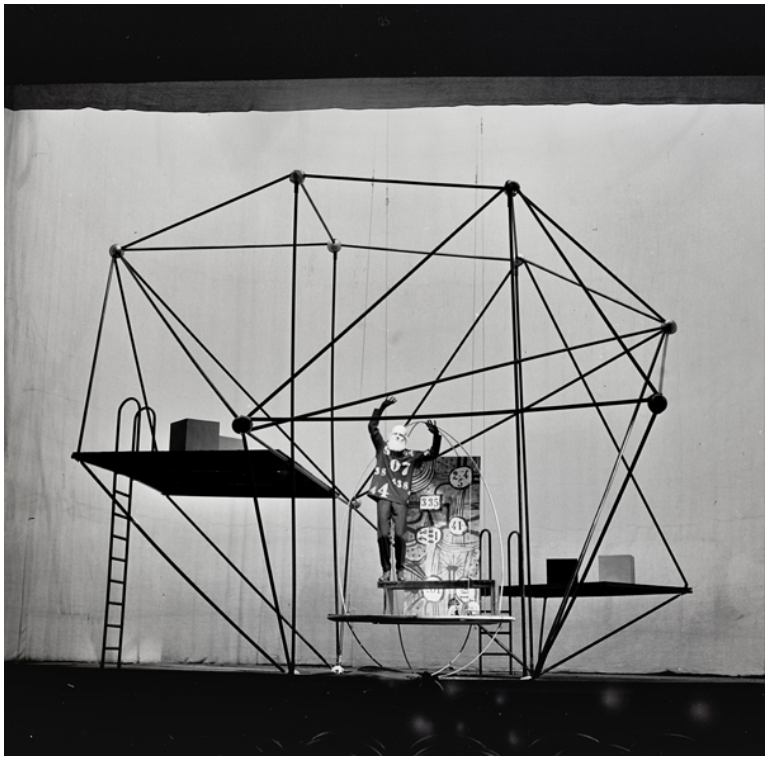


Figure 5 Faust directed by Grotowski, 1960, Photo: Grażyna Wyszomirska

https://grotowski.net/en/media/galleries/faust-2

I.B.2. Multimedia Theater Aesthetics

I.B.2.a. Postdramatic Aesthetics

The aesthetics of Multimedia Theater can be no other than the aesthetics of the *Postdramatic Theater*, a notion that was established by the German theater researcher Hans-Thies Lehmann. In his book *Postdramatic Theater* he exhaustively presents this new type of theater that emerged as an inevitable response to the emerging technologies of the 1970s.

Postdramatic theater refers to a theater that functions and evolves beyond drama, i.e. dramatic text, linear plot, representation of the psychological world of fictitious human characters. This does not mean that this theater denies drama, but rather that it explores and redefines its meaning under the following perspective: **theater has to become an act/moment of unmediated communication between artists and spectators**.

"Postdramatic theater can be seen as an attempt to conceptualize art in the sense that it offers not a representation, but an intentionally unmediated experience of the real (time, space, body). […] The actor of postdramatic theater is often, no longer the actor of a role, but a performer offering his/her presence on stage for contemplation.
[…] Since the immediacy of a shared experience between artists and audience is at the heart of Performance Art, it is obvious that the closer theater gets to an event and to the performance artist's gesture of self-presentation, the more a common borderland between Performance and theater develops.[…] As theater brings into play its real "event-ness", it discovers its capacity to be not only an exceptional kind of event but a provocative situation where visitors would become active themselves and discover or develop their creative potential" (Lehmann, 2006).

Consequently, the new "drama", now-called *Performance Text (Lehmann, 2006)* is the sum of everything that exists or is produced during the performance (performers, verbal and physical communication, lighting, space etc) is characterized by:
"

- *more presence than representation*
- *more shared than communicated experience*
- *more process than product*
- *more manifestation than signification*

- *more energetic impulse than information*

" (Lehmann, 2006).

Postdramatic theater is the theater of the presence, of the real. It can be an encounter for visual arts, music, dance, digital arts and theater. It is poetic, non-hierarchical, unlimited, ambiguous, undefined in a way, waiting for the participating audience to determine its communicative success. It is a profoundly interactive event that offers *self-interrogation, self-exploration, self-awareness and finally self-transformation of all participants*.

The aesthetics of the Postdramatic Theater are the aesthetics of its elements - the aesthetics of the space, time, body, text and media used in the performative experience. The exhaustive research of these notions not in the context of a realistic representation but of a memorable event where *sensuously intensified perceptibility comes to the fore (Lehmann, 2006)* transforming the spectator to co-creator, leads to Postdramatic theater aesthetics' palette. The deeper the research, the wider the variety of aesthetic traits. Lehmann names some of them: "*non-hierarchical structure of elements, simultaneity of communicated signs, playing with the density of signs (dialectic of plethora and deprivation, plenitude and emptiness), ritual, musicalization, visual dramaturgy, coldness in performers (due to the de-psychologization of performing), visual overheating (flood of images), auto-sufficient physicality (the actor's body becomes the center of the attention not as a carrier of meaning but in its physicality and gesticulation), states and metamorphosis instead of action, dynamic formations, perceptibility, undecidability whether one is dealing with reality or fiction (the real - "the accident"- in the act of performing is a co-player), reversion of the artistic act towards the viewers, reversion from the work to the process etc." (Lehmann, 2006).*

And the list goes on and on in this infinite procedure of experimentation and observation as generally in art the desirable result cannot be reached through a global one way equation. Art is a complex dynamic system that keeps reshaping and redefining itself all the time. Thus, the final basic performing aesthetics are literally defined on the last day of rehearsal and every performance is a chance of re-evaluation. The artistic aesthetics methodology is based on the continuous system of experimentation, observation and re-evaluation, thus on the *successive approximations of the question "What do I do?"* (Koen, 2003) - (see also I.A.1).

Examples from some great postdramatic theater practitioners:

- Theodoros Terzopoulos «The Trojan Women» (2018) :

Figure 6 The Trojan Women Photo: Joanna Webber

Figure 7 The Trojan Women Photo: Joanna Webber

Figure 8 The Trojan Women Photo: Andreas Simopoulos

Theodoros Terzopoulos focuses on the ritual of the performer's body as an expression of the archetypal body of ancient God "Dionysos" that everyone carries within him/her. Thus, Theodoros Terzopoulos' performances could be considered as a profound research of what

the human inner body could achieve and he completely denies the use of multimedia on stage, as he considers that everything can be created from the performer's own body. Indeed, the performers on stage are astonishing.

- Romeo Castellucci "La Vita Nuova" (2019)

Figure 9 La Vita Nuova Photo: Veerle Vercauteren

Figure 10 La Vita Nuova Photo: Lorenzo Alunni

Figure 11 La Vita Nuova Photo: Veerle Vercauteren

Romeo Castellucci believes that “Each body has its own tale” and he exposes it as a sculptural object. Consequently, every project is usually performed by a different group of performers. “*He often integrates people with an ‘abnormal’ physicality or a physicality modified by disease” (Lehmann, 2006)* and he creates a ritual atmosphere. He often incorporates new technologies in his artworks.

- Robert Wilson “Odyssey” (2012)

Figure 12 Odyssey Photo: Patroklos Skafidas

Figure 13 Odyssey Photo: Evi Fylaktou

Figure 14 Odyssey Photo: Evi Fylaktou

Robert Wilson's theater is the theater of metamorphosis, of gaze, of visual dramaturgy. He uses a lot the change of lighting, transforming the stage space into landscape. He also creates "audio landscapes", as he calls them. His performers transform into enigmatic figures, gestic sculptures, which seem to be moving magically. He was one of the firsts to experiment with the new media and he is widely known for the digital performance "Einstein on the Beach" (1976), a collaboration with Philip Glass that "*was acclaimed as a landmark in the development of American (and world) theater" (Dixon, 2007).*

Figure 15 Einstein in the Beach directed by R.Wilson, Photo: Philippe Gras

Figure 16 Einstein in the Beach directed by R.Wilson, Photo: Philippe Gras

Just three examples from three different artists make us understand the variety of postdramatic approaches that exist. However, what we can observe is the clarity of the atmosphere they all bear.

I.B.2.b. Music and Theater

Musicalization is a very important stage sign of postdramatic theater. Due to always bearing musicality to my personal lens and perception of the world, I am really attached to the idea of approaching theater as music. I am almost obsessed with rhythm and the way words resonate. In a talk given in Frankfurt about the 'musicalization of all theatrical means', Eleni Varopoulou elaborated that

"for the actor, as much as for the director, music has become an independent structure of theater. This is not a matter of the evident role of music and of music theater, but rather of a more profound idea of theater as music. Maybe it is typical that a woman of the theater like Meredith Monk, who is known for her spatially arranged poems of images and sounds, once remarked: 'I came to theater from dance but it has been theater that brought me to music", (Lehmann, 2006).

Meredith Monk is a great multi-disciplinary artist, who combines music with dance, theater, film and visual arts. In her performances she pursues simplicity and poetic dimension. She is a composer, singer, director, author, actress, dancer, pianist and choreographer. She has a very unique, rhythm based style and a deeply explored vocal instrument that produces really uncommon, surprising, inspiring sounds.

Figure 17 Meredith Monk's film "Turtle Dreams" (1983) - shot by Ping Chong

Another representator of this approach is the composer and theater director Heiner Goebbels who practices *"*conceptional composing*, as he calls it, where he combines the logic of texts and the musical and vocal material in many variations" (Lehmann, 2006).* The result is a "scenic concert". He often incorporates new technologies.

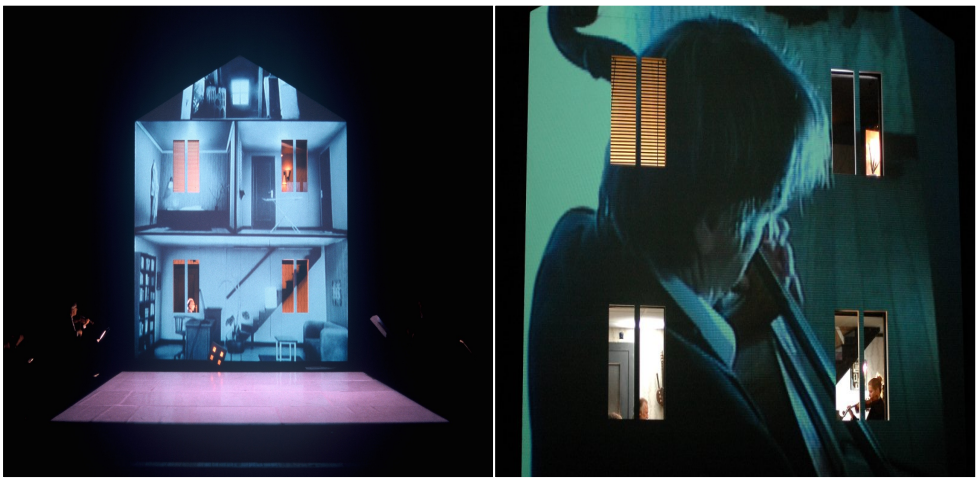


Figure 18 Goebbels' Eraritjaritzaka – musée des phrases

Laurie Anderson is a multi-disciplinary new media artist that expanded this approach to new technologies. She is considered the doyenne of digital performance and she is known worldwide for her early adoption of digital techniques in music, narration, elaborate multimedia theater events, and visual and electronic art works (Dixon, 2007). At the same time, Anderson is a pure storyteller whose primer goal is to communicate with the spectators: "One of my jobs as an artist is to make contact with the audience" (Dixon, 2007). She also tried to explore how people could transform to expressive artists rather than just "fans". "*It is her restless energy and multi-skilled expertise as a storyteller, performer, composer, violinist, keyboard player, digital artist, author, poet, and inventor – the complete late-twentieth-century artist – that ensures Anderson a place in several "halls of fame", not least for being an architect of new digital forms in her ceaseless examination and sharing of observations about human condition" (Dixon, 2007).*

Figure 19 Anderson's Dilusion (2010), https://vol1brooklyn.com/2010/09/24/thoughts-on-laurie-andersons-delusion-at-bam/

I.B.2.c. Music in Interactive Multimedia Performance

Inspiring examples of interactive multimedia performances, whose main element is music:

- ***Dialtones (A Telesymphony)*** (2001-2002: Golan Levin, Gregory Shakar, Scott Gibbons, Yasmin Sohrawardy, Joris Gruber, Erich Semlak, Gunther Schmidl, Joerg Lehner, and Jonathan Feinberg)

Dialtones is a mobile ringtones concert performance. Before the concert the participants connected their mobile phones to web terminals and new ringtones were sent to their phones according to their seating number. During the concert live performers dialed up the spectators, using custom software, resulting in a live musical composition and at the same time visualizing its score by lighting each time the spectator (seat) whose phone was ringing. The software used allowed up to 60 phones to ring simultaneously.

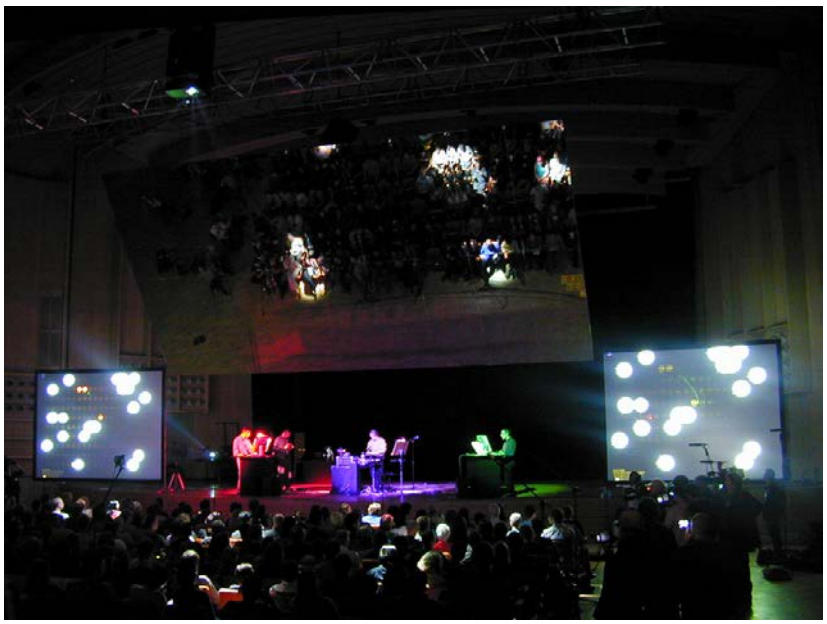


Figure 20 Dialtones (A Telesymphony), 2011, http://www.flong.com/projects/telesymphony/

- ***Brain Opera*** (1996)

Brain Opera was a conception of Tod Machover with a libretto by Marvin Minsky. Three performers used three specially designed "hyperinstruments": A "Sensor Chair", a "Gesture Wall" and a "Digital Baton". These instruments produced sounds depending on the performers' gestures. At the same time, screen projections illustrated more in different ways the performers' actions. The sound and video elements were pre-created by the audience.

At the end of the performance, the spectators were invited to dance on a “Sensor Carpet” enriching the sonic result.

Figure 21 Brain Opera, 1996, https://www.youtube.com/watch?v=Z1auoz4Qgro

- ***Rain Dance/Musica Aquatica*** (1998)

Paul DeMarinis’ RainDance/Musica Aquatica is an installation of twenty organized streams of falling water. When visitors pass and the water hits their umbrellas, different sounds are created. The frequencies of the sounds created are related to the number of droplets per second. E.g. 440 droplets per second on the umbrella play the note A.

Figure 22 Rain Dance, 1998, https://www.youtube.com/watch?v=jOakK59iKTA

I.B.2.d. Music in "Nine Evenings: Theater and Engineering (1966)"

The electronic engineer Billy Klüver played a major role in the art and technology movements of the 1960s, as he collaborated with many artists. The highlight of this tendency came in 1966 when he associated with a great number of performers, dancers, actors and thirty of his engineering colleagues from Bell Laboratories and they created the historical event: "Nine Evenings: Theater and Engineering". This event consisted of ten performances.

For John Cage's performance "Variations VII", David Tudor created a live musical composition using sounds that were picked up via telephone lines, microphones, communications bands, frequency generators and household appliances.

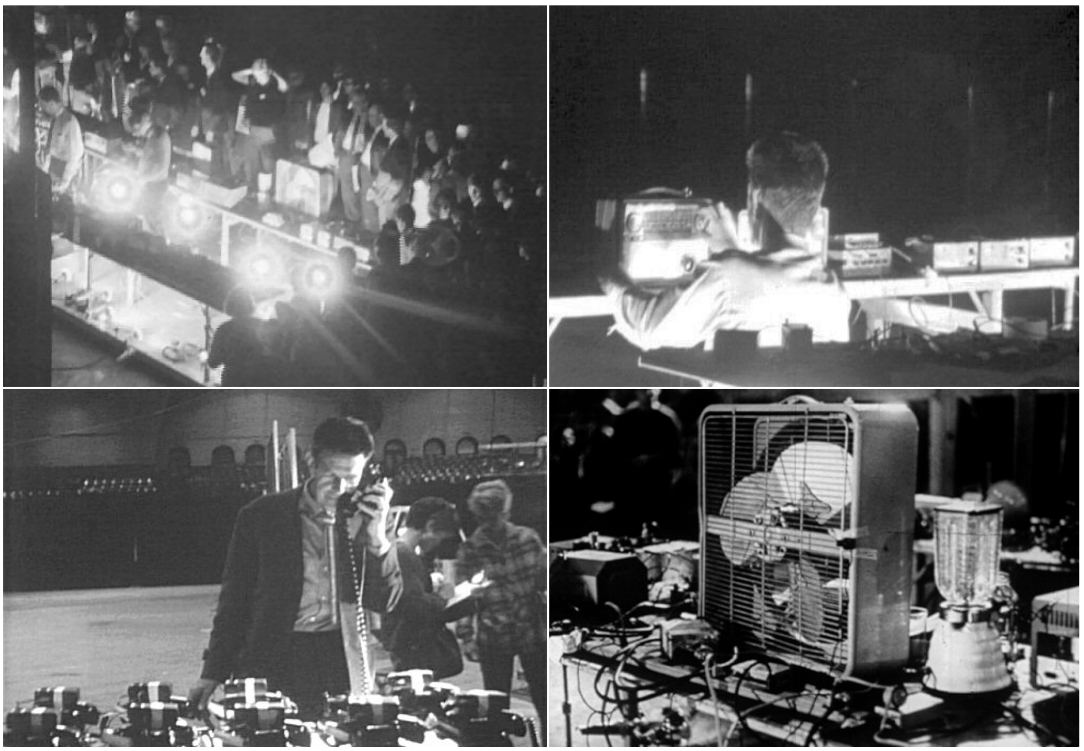


Figure 23 Variations VII, 1966, https://www.fondation-langlois.org/html/f/selection.php?Selection=9EVO

In Rauschenberg's performance "Open Score(Bong)" there was a full-sized tennis court where Frank Stella played a tennis match with the professional tennis star Mimi Kanarek, using wired, sound-emitting rackets designed by Klüver. The sounds of the rackets also controlled the lighting, leading gradually to darkness. Also, the gestures of five hundred volunteers were monitored by infrated cameras. Video images of the match and of the volunteers' gestures were projected on three screens.

Figure 24 Open Score, 1966, https://www.fondation-langlois.org/html/f/selection.php?Selection=9EVO

The success of "Nine Evenings" prompted discussion between Klüver, Rauschenberg, Robert Whitman, and Fred Waldhauer to establish an organization to further collaborations between artists and engineers, and led to the formation of Experiments in Art and Technology (E.A.T) in 1967. Klüver's pioneering work in the 1960s had led Garnet Hertz to dub him "the Godfather of Art and Technology" (Dixon, 2007).

In 2016 the Event was "revisited by Arts Catalyst, including a night of new cross-disciplinary performance art and an archival exhibition and was named *9 Evenings: Theatre and Engineering Revisited 1966/2016*" (Arts Catalyst, 2016).

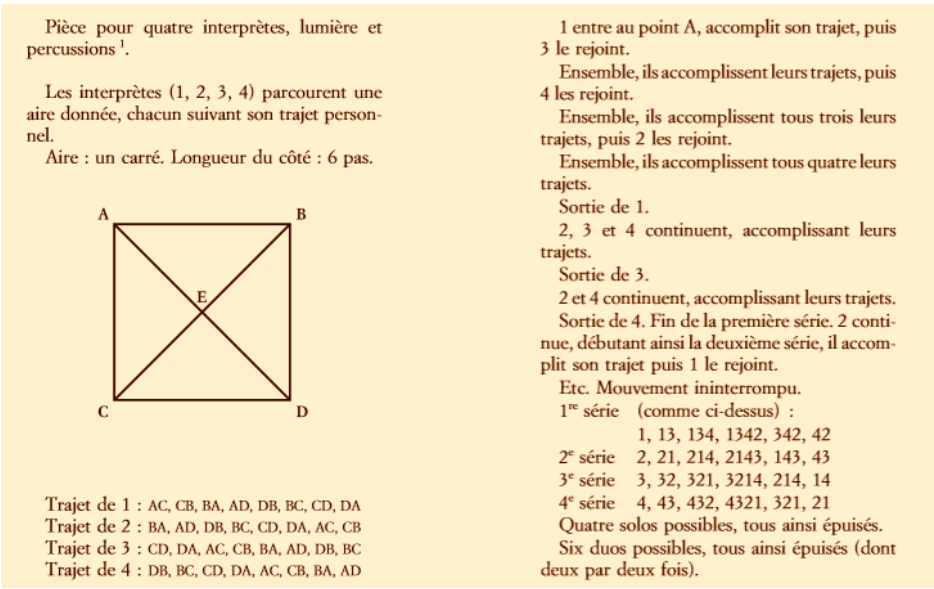
I.C. Beckett and New Media

I.C.1. Aesthetics in Beckett's world

I.C.1.a. Beckett and Minimalism

Samuel Beckett's world is the world of absurd, of abstraction, of symbolism, of poetry. His words seem to echo the inner existential agony of the human being. There are times when they sound like incomprehensible linguistic formations, and other times like deep confessions. His characters seem like ubiquitous shadows that continue to exist even in the dark. They are usually trapped in bewildering situations, where nothing and everything coexist. Sometimes they indulge in a relentless murmur and other times in a deafening silence. Everything has a meaning and at the same time is meaningless. No one can understand what these strange living creatures are saying, still everyone can identify with them. They are like avatars, that everyone can fit inside them as long as they realize the commonality of fears, envies, pains and joys they bear.

Beckett's plays include meticulous description on the scenography, the roles, even on the roles' actions, movements and position in relation to the text – in case it exists. Beckett had a very precise, mathematical conception and he usually wanted to be performed exactly as it was envisioned. His basic structural elements are repetition, abstraction, seriality, minimization of means, conceptual simplicity, slight variations on recurrent formations, perceptual ambiguity, geometry, word association etc.



Pièce pour quatre interprètes, lumière et percussions [1].

Les interprètes (1, 2, 3, 4) parcourent une aire donnée, chacun suivant son trajet personnel.

Aire : un carré. Longueur du côté : 6 pas.

Trajet de 1 : AC, CB, BA, AD, DB, BC, CD, DA
Trajet de 2 : BA, AD, DB, BC, CD, DA, AC, CB
Trajet de 3 : CD, DA, AC, CB, BA, AD, DB, BC
Trajet de 4 : DB, BC, CD, DA, AC, CB, BA, AD

1 entre au point A, accomplit son trajet, puis 3 le rejoint.

Ensemble, ils accomplissent leurs trajets, puis 4 les rejoint.

Ensemble, ils accomplissent tous trois leurs trajets, puis 2 les rejoint.

Ensemble, ils accomplissent tous quatre leurs trajets.

Sortie de 1.

2, 3 et 4 continuent, accomplissant leurs trajets.

Sortie de 3.

2 et 4 continuent, accomplissant leurs trajets.

Sortie de 4. Fin de la première série. 2 continue, débutant ainsi la deuxième série, il accomplit son trajet puis 1 le rejoint.

Etc. Mouvement ininterrompu.

1re série (comme ci-dessus) :
1, 13, 134, 1342, 342, 42
2e série 2, 21, 214, 2143, 143, 43
3e série 3, 32, 321, 3214, 214, 14
4e série 4, 43, 432, 4321, 321, 21

Quatre solos possibles, tous ainsi épuisés.

Six duos possibles, tous ainsi épuisés (dont deux par deux fois).

Figure 25 Excerpt from S.Beckett's play "Quad"
https://excerpts.numilog.com/books/9782707313898.pdf

Inferentially, Samuel Beckett's work has common characteristics with Minimal Art (Middeke, 2006). As mentioned in Wikipedia: "*The term **minimalist** often colloquially refers to anything that is spare or stripped to its essentials. It has accordingly been used to describe the plays and novels of Samuel Beckett*".

I.C.1.b. Beckett and Music

Samuel Beckett's strong connection to music is a point of great interest among researchers and analysts of Beckett's work (Tucker, 2014). There are three elements that testify to Beckett's special relationship with music. In the first place his musical family's background and his early personal involvement, secondly his own references in his work and lastly the structural analysis of his texts.

Beckett's uncle was a pianist and from an early age Beckett would accompany him on the piano. At school Beckett used to sing his own words to some of the hymns he had to share and was generally very inventive in making his own "lyrics covers", as he did for the Gilbert and Sullivan operas. He kept self-educating in music and even in his "Dream Notebook", where he has gathered all the items that he used while he was writing his first novel *Dream of Fair to Middling Women*, he mentions his research in Beethoven - from whom he was greatly influenced in his prose narrative technique as he himself refers to the "incoherent continuum as expressed by, say Rimbaud and Beethoven" (Tucker, 2014). Beckett's references to music composers in his works are really wide and many musical pieces appear: In *Bande et Sarabande* Schubert's Lied Andie Musik comes up (also the star field of the universe is linked to "an abstract density of music"), in *Love and Lethe* Ravel's Pavanne, in the radio play *All That Fall* Schubert's Death and the Maiden quartet, in another radio play *Embers* Chopin's Waltz No 5 in A flat, in the television play *Ghost Trio* Beethoven's Ghost piano trio, in *Krapp's Last Tape* the hymn "Now the day is over'" , in *Happy Days* the waltz from Lehar's The Merry Widow etc. Furthermore, in the radio play *Words and Music*, one of the main characters is entitled "Music" and music is literally participating in a dialogue with the two other characters of the play. What is more, even a music score appears in his novel *Whatt*. "*As Catherine Laws points out, even though there is no specified score for Music: the play seems to proceed as if its role is clear and understood and Ruby Cohn summarizes that Words and Music is a composition about composition"(Tucker, 2014).*

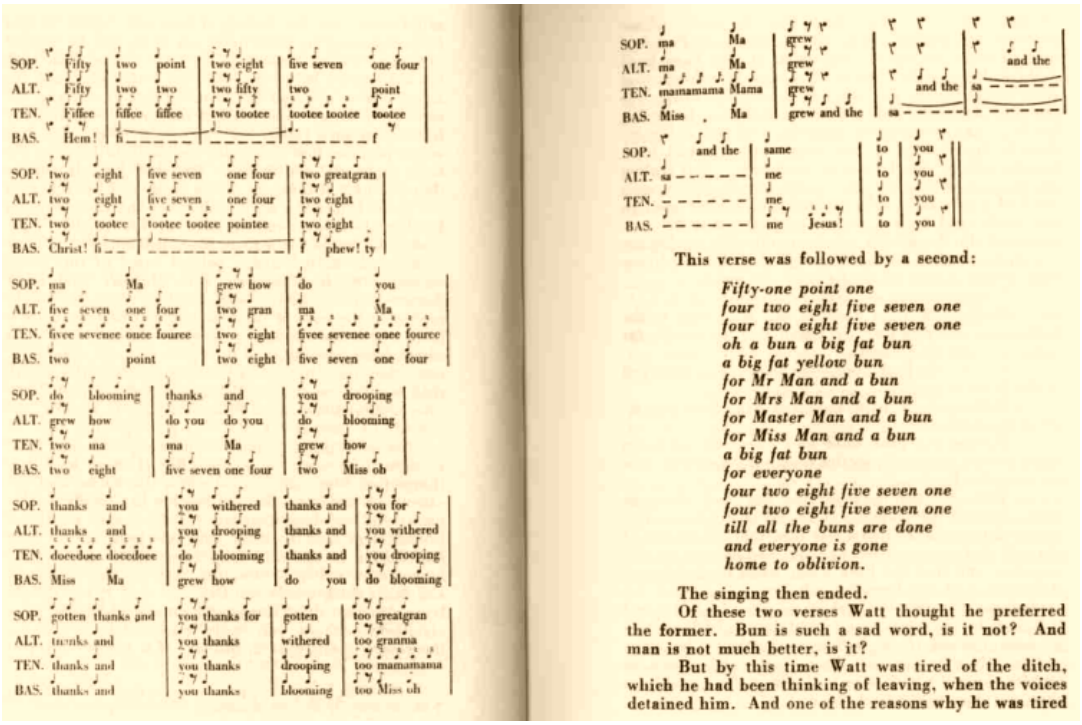


Figure 26 excerpt from S.Beckett's novel *Whatt,* https://www.uni-bamberg.de/fileadmin/uni/fakultaeten/split_lehrstuehle/englische_literatur/Materialien/Mueller/Beckett/Watt1.PDF

Inevitably, all this musicality could not appear in his works only as reference or as an individual expression of its existence. It can be widely encountered in Beckett's text language, structure and aesthetics. "*His first (unpublished) novel 'Dream of Fair to Middling Women' clearly strives for quasi-musical expression: a digression is described as a cadenza; repeated passages are dacapo; meanings are orchestrated; whispers are pianissimo; scenes are designated as duos or trios" (Till, 2013).* His texts are like well orchestrated ensembles of words, actions and silences. At times words seem like musical notes given in such a serial, rhythmic arrangement that they lose their linguistic meaning and can be perceived merely as sounds. *Beckett once explained "Music is the highest art form since it's never condemned to explicitness"* (Werner, 1999) and he has once stated discussing on the play *Words and Music* that "Music always wins" (Why music struck a chord with Beckett | Stage | The Guardian).

I.C.2. Beckett with New Media

As Martin Esslin states, Beckett was really interested not only in mathematics, but also in technology (Tsakalakis, 2018). Furthermore, "Linda Ben-Zvi also affirms: …Albright argues, and I concur, that Beckett cleverly used technology and media for his own purposes" (Tsakalakis, 2018). Among his thirty-three dramatic works, six were written for radio, one for film, and five for television. Many artists have experimented with his work and have tried to incorporate new media even in plays that were not destined for new technologies. Being one of them myself, I can assure that Beckett's artwork, because of its non-realistic and non-site-specific character, can trigger artists' imagination and inspiration. Of course this tendency might seem against Beckett's will for his plays to be performed exactly as he envisioned and too difficult to succeed in restating his artistic thesis, but at the same time, in the name of love and respect toward his artwork, artists take the risk that Beckett stated should be an artist's only obligation: "the first to admit that to be an artist is to fail, as no other dare fail."

Here are some interesting examples of experimenting with Beckett's work:

- *Beckett on Film (2001)*

Figure 27 Footfalls and A piece of monologue (up and down respectively)

https://www.youtube.com/watch?v=AeMQXNm3c5c&t=229s

https://www.youtube.com/watch?v=kWS1LrxCROs&t=299s

Beckett on Film was a project, conceived by Michael Colgan - artistic director of Dublin's Gate Theater, aimed at making film versions of all nineteen of Samuel Beckett's stage plays, with the exception of the early and unperformed Eleutheria (Wikipedia). Each play is directed and performed by different artists. In general it is a very good project as most films where insightful and all of them succeeded in bringing into light at least one basic characteristic of Beckett's style and intention. e.g. In *Happy Days* and *Waiting for Godot* the relationship between the characters is greatly illustrated through the realistic approach of the actors' performance, *Footfalls* is wonderfully poetic and deeply dramatic, *A piece of monologue* underlines the power of simplicity, in *Play* the makeup aesthetics are really good etc.

- *All that fall - Pan Pan Theater Company - Installation (2011)*

Figure 28 Photo by Ros Kavanagh, http://panpantheatre.com/shows/all-that-fall/

"All that Fall" is a one-act radio play written by S. Beckett following a request from the BBC in 1956. Pan Pan Theater Company created a sound and light installation, where the audience could sit on comfortable rocking chairs with cushions embroidered with skulls and listen to the recorded voices emitted from speakers. The installation greatly bore the atmosphere of the play and the spectators where nicely embodied in the installation. Still, personally, I would try to create a "live radio emission", so that the voices would be the result of a live performance. That way, I could experiment with the liveness of the performance. Furthermore, aesthetically I would not include any descriptive elements in the scenography (e.g. skulls on cushions to illustrate death essence, carpet with playground designs to illustrate the childlessness of the central character).

- *Intermedial, Virtual and Augmented Play (2017-2019)*

Figure 29 Preliminary drawings for user experience in relation to urns *© V-SENSE*

Trinity College Dublin has been experimenting since 2007 with Beckett and new technologies. Research projects have included the stage adaptation and installation of a television play (Ghost Trio, 2007), the HD digital video exploration (Abstract Machines, 2010) of two television plays ("…but the clouds…" and "Nacht und Träume") and many other smaller projects of a "fundamental research" undertaken at the Samuel Beckett Laboratory (2013-2017).

The most recent project is a two year practice-based research trilogy on Samuel Beckett's theatrical text, *Play*, for digital technologies and it is collaboration between the School of Creative Arts/Trinity Centre for Beckett Studies, the School of Computer Science and Statistics, and the Department of Electrical and Electronic Engineering. The project is led by Néill O'Dwyer (V-SENSE), Nicholas Johnson (Creative Arts), and Enda Bates (Music Media Technologies).

The first part of the research is a reinterpretation for webcast and is called *Intermedial Play.* It is a screened live-stream of *Play* (sent via a PTZ robotic camera into ATRL).

The second part is an interactive VR installation, called *Virtual Play.* In Beckett's script, three heads that are provoked into speech by a light Beckett described as an "interrogator". In *Virtual Play* the user wears a VR headset and according to where they turn their heads, they trigger the virtual heads to talk. Thus, the spectators play the role of the "light interrogator".

The third part is the *Augmented Play,* which is an adaptation of *Virtual Play* for augmented reality. The user activates the characters into speaking by looking at them. The characters were recorded using 3D volumetric video techniques and displayed using either the Microsoft HoloLens or the Magic Leap augmented reality (AR) head-mounted displays (HMD). The volumetric video data were the same that were captured for the *Virtual Play*.

The whole concept was insightful both in terms of dramaturgy and the interaction and integration of the spectator. However, I believe, aesthetically the project needs reconsideration.

- *Act Without Words (2018)*

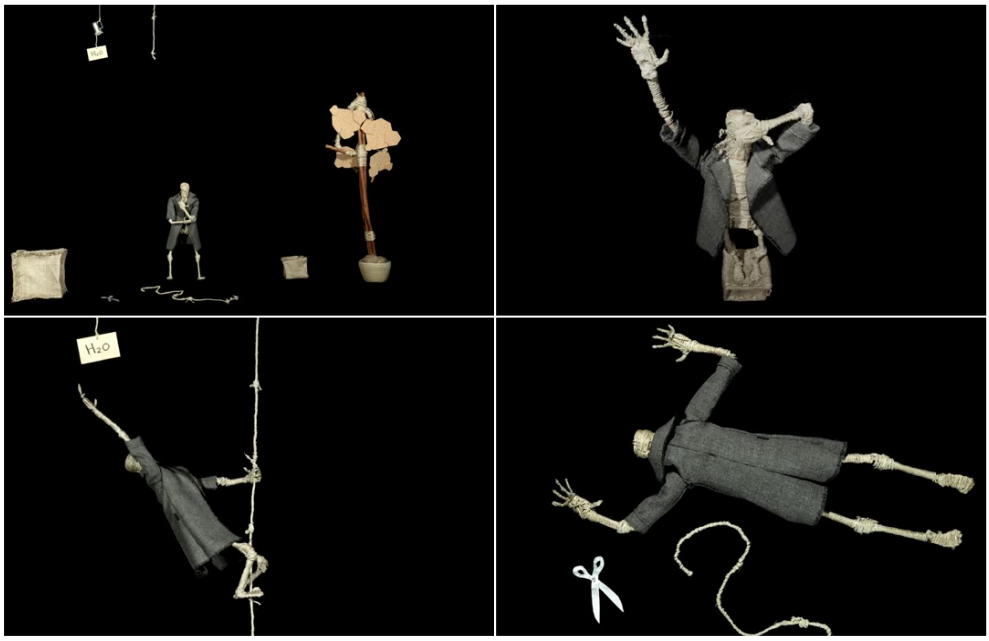


Figure 30 Act Without Words https://www.youtube.com/watch?v=SVTmPS4okW8

Aesthetics is a very difficult issue, and this work perfectly approaches it. It is a stop motion film by Dimitris Gazis and Yiannis Skouras based on Beckett's play "Act Without Words I". It was created as a thesis work in the MA Digital Arts in ASFA. The music and sound design was designed by Kostas Karamitas and the costume design by Kakia Chatzigiannidi. Everything in this project is smoothly elaborated.

The next two projects are very good examples on how a project can be inspired from a play without reproducing it in its entirety.

- *Lucky 2.0 - Cédric Plessiet - VR installation (2012)*

This installation is based on S.Beckett's theatrical play *Waiting for Godot* and it reproduces the relationship of Lucky and Pozzo, which is a master-slave relationship. The user takes the role of Pozzo and controls the virtual Lucky with their voice or with a rope. This metaphor is interesting as it underlines the eternal condemnation of Lucky to serve Pozzo and raises the question: Would you hold the rope?

Figure 31 Lucky 2.0, Cédric Plessiet

- *Happy Days - A theatrical installation or Staging Beckett with 11 motors (2014-2015)*

This installation is based on Beckett's "Happy Days". It was a master project by Irena Kukric & Canny Sutanto. The concept is that objects have a life and can survive by themselves in a repetitive performative ritual. Thus, some of the original play's basic objects are used in this installation as "actors" that are controlled by arduino motors (servos and dc) with the use of a live programming environment called VVVV. The result is a five minute sound, light and movement installation. The whole idea and its realization are beautifully accomplished, as the general aesthetics are flourishing. Yet, taking into consideration that this project was inspired on Beckett's homonym theatrical play, I personally feel that it lacks something important: Winnie - the main character of the play. I would probably have integrated either a silent performer - object so as to underline the dominance of the objects on her existence or a recorded voice talking as Winnie that could enhance the sound result.

Figure 32 Happy Days Installation, http://www.irenakukric.com/files/happy_days.pdf

PART II:

“Performing Engineering” on S. Beckett’s Happy Days

After having examined the state-of-the-art at our disposal, we will implement the Performing Engineer’s Technique and through successive approximations within the available resources we will try to create a Poor Interactive Multimedia Performance based on S. Beckett’s play *Happy Days*.

II.A. Initiation phase

Before starting experimenting we need to read the play again and again and analyze its dramaturgy and aesthetics.

II.A.1.Dramaturgy and Aesthetics Analysis of Happy Days

Samuel Beckett's "Happy Days" is a theatrical play in two acts. The main and only characters are Winnie and Willie. At the first act Winnie is buried to her waist and follows her daily routine using her personal objects, while talking incessantly to her husband Willie, referring to happy days of the past. Willie is hidden away from Winnie, reading silently his newspaper and communicating with her scarcely ever. Whenever this occurs, Winnie is very happy. At the second act, Winnie keeps soliloquizing, but now she is buried up to her neck. Among her personal objects (toothbrush, toothpaste, sunglasses, mirror etc.), there is also a gun. During the whole play, Winnie is waiting for the right moment to sing her song. This moment is very important for her and she can't sing until literally the song comes out of her soul. This moment comes at the end of the play, when Willie finally leaves his newspaper and comes from the other side of the cliff to meet her. Winnie feels a happy day has finally come again and starts singing.

- ***Aesthetics of complexity***

Happy Days was written in 1961, in a decade when new technologies were starting to proliferate. Patrick Whitmarsh has a very interesting approach based on the statement that Beckett reflects in Happy Days his emergent concern with media technologies (Whitmarsh, 2019). He considers that Winnie's estranging physicality (buried in the ground) makes her use her verbal communication with Willie as a form of re-embodiment and that this could be "*a visual analogue for the re-embodiment of the self within the accumulating information and messages of the cybernetic age" (Whitmarsh, 2019).* Winnie observes and resists to a systemic process she cannot understand, that is trying to absorb her body in the ground. The earth can be seen as an analog of the informatic overflow of the new media age. Whitmarsh names Winnie's observation of this incomprehensible system: "*aesthetics of complexity"*, and considers the whole play as a creative mode to resist human absorption in complex communication systems. "*Beckett presents his characters as self-observing agents, reflexive nodes enmeshed within systems of communication. Their bodies materialize as elements of these systems, suggesting a sense of communication as a continual process of re-embodiment" (Whitmarsh, 2019).*

- ***The role of music in Happy Days***

Winnie keeps wondering throughout the play, when will be the right moment to sing her song. She even states that "to sing too soon is fatal". She opens her music box, the melody of her song is heard, but still she does not sing until the end of the play. Her personal objects' omnipresence seems to resonate accompanying her never ending speaking voice. The ground itself emits thermodynamic signals of a life that is about to end. Winnie also says that "she sometimes hears sounds - sounds are a boon - those days when she hears sounds are happy days". Furthermore, Beckett apart from being greatly interested in materials that resonate, he very often created action choreographies. Megan Girdwood states that "*even a "static" play like Happy Days is almost a dance play" (Girdwood, 2019)*.

Thus, I feel that the whole play can be dealt like a musical composition that diffuses the past happy memories in the insupportable cybernetic "wilderness" through Winnie's static dance and speaking song.

II.B. Experimentation phase

Many experiments have been made until the creation of the final project. Some experiments where based on the "*heuristic: always make the minimum decision"(Koen, 2003),* so as to discover new paths through continuous experimentation applying the "*heuristic: engineering is trial and error"(Koen, 2003)*. Other experiments were a result of the "*heuristic: always give yourself a chance to retreat" (Koen, 2003).* In any case, every step that was made, always took into consideration the available resources, thus the available *"state-of-the-art = a specific set of heuristics valid at a well-defined time" (Koen, 2003)*. In other words I always tried to answer previous posed question.

Here is the first Q & A series that triggered the whole experimentation phase:

1) Question: What is my goal*?*

Answer: To create a poor interactive multimedia performance, based on S. Beckett's play "Happy Days".

2) Q: How could I work towards a poor interactive multimedia performance?

A: By always keeping in mind that the performer must be the core of the performance. Therefore, the performer will take the role of Winnie.

3) Q: How could interactivity be approached?

A: Through the elements that interact with Winnie in the play: her personal objects and Willie.

4) Q: What media should I use?

A: I have no idea, yet.

5) Q: What is the minimum decision I have to take now to start experimenting?

A: That interactivity is the basis and that two are the basic points of experimentation: a) objects that resonate and b) Willie.

II.B.1. Objects that resonate

II.B.1.a. An interactive performance without digital media

The first experiment was a performance without any digital media, investigating interactivity and how could Winnie's personal objects resonate. I collected some of Winnie's personal objects: a flashlight, a lipstick, a scarf, a brush, a postcard, sunglasses, a toothbrush and a small bottle. I also chose some lines from Winnie's text, like "This will have been another happy day", "Words fail. There are times when even words fail", "Happy days are here again", "If only I could bear to be alone. I mean prattle away with not a soul to hear" etc. I made a small installation with the objects, some white sheets of paper and a pen and put a bench in front of the installation where the audience could sit. The performance began. I explained to the spectators that they will be invited one by one to get on stage, to select an object and follow my instructions. Whenever they felt they did not want to continue, they could just stop and go back to their seats. So, the spectators one by one, after my indication, came on stage and selected one of Winnie's objects. The first instruction was to use the object they selected and experiment with what sounds it could create as if it was an instrument. For example, one took the lipstick and started opening and closing its cap. When the first sound was created, I immediately responded to it by creating a sound with my voice (for this object it was a "k"), corresponding to the timbre, rhythm and volume produced by the cap tap. The spectator understood the interaction, so she continued producing these "lipstick sounds", but her attention was not any more at the lipstick, but to our interaction. She wanted to see if I could correspond in time and properly, she tested my limits, she wanted to explore the sounds I could create with my instrument - my voice and body. She understood her interactive dynamic and tried to trigger me, to communicate with me, to "pinch" me as S. Meisner could have said. At the same time this sound interaction was occurring, without stopping creating sounds, I wrote on a blank sheet of paper a

message. “Say a word that is important for you, without stopping what you are doing”. The creator-spectator was not anymore that at ease, because she had to coordinate two different things. Her movements -“lipstick sounds” in interaction with me and her speech. Finally, she did say the world “future”, without stopping her lipstick interaction with me. I then took a second sheet of paper and wrote the instruction “continue saying the word” and so she did, until the moment she left the lipstick fall on the floor. She had chosen the end of our interaction. Silence was created. I wrote on another sheet of paper “thank you” and she went to sit. The performance finished when everyone had come on stage and interacted with me. It was very interesting to see each spectator’s interaction and to hear the sound composition that was created each time. For example, another spectator chose the scarf and she used her whole body to create sounds. She started dancing as she was trying to make the scarf float in the air. I was interacting with her with my breath and my movement also. Her approach was not a triggering-to-the-limits approach, like the lipstick-interaction, but an invitation to dance in the air together. Her word was “harmony”.

I feel the whole experiment was successful as through interactivity every participant had become a creator and the objects had more than resonated. What is more, although the whole performance offered a lot of space for creativity to the spectators, it never had any rhythm problems, as I could orchestrate it. Therefore, it could be watched as a complete performance.

The important words that came out of this procedure, thus resonated, were: Future, Harmony, Nothing, Weather, Tomorrow, Decongestion.

II.B.1.b. Unity - SuperCollider communication

Based on the concept of the previous experiment, I wanted to achieve sound interactivity with a digital medium. Thus, I decided to create a 2D dialogue in Unity that could lead to an interactive musical composition.

An interactive dialogue was created in Unity. Questions are posed with multiple answers the user could choose. Clicking an answer leads to a new scene with another question and so on. The questions and the available answers (words) were chosen from Beckett’s text. No matter the answering path the users follow, at the end all reach the same scene: a scene with Winnie’s personal objects. By dragging or clicking on an object, a message is sent via OSC protocol to SuperCollider that triggers a sound. There are four kinds of sounds:

1) A melody that is cut in 6 parts and each part is triggered by a different object. Consequently, the users can experiment with the sounds, and if they understand a melody can be produced when they click on the objects with the correct sequence, they can have the pleasure of creating a melody. If no, each sound can also stand by itself and be triggered however the user likes.

2) A pattern that creates random rhythmical sounds.

3) A dust sound whose density is analog of the position of the object on the x axis in Unity. Thus, whenever the user moves the object by dragging it, the density of the dust changes.

4) A function that contains twelve different excerpts from Beckett's text. The excerpts were recorded with my voice and stored as buffers. Each click on the object triggers randomly a different buffer in a random volume. Thus, the more the clicks on the specific objects, the more voice excerpts can be heard simultaneously, creating a sense of a murmuring song.

All in all, the user can interact with the 2D objects and create a sound composition. One has also the choice of clicking some buttons that can stop and reboot the synthesis, so as to create the sense of a media player. All sounds were created in SuperCollider, except from the voice recordings.

Figure 33 one of the Unity 2D dialogue scenes

The available answers fade in and out at different frequencies. The user's click on them, leads to the next scene only after a certain amount of transparency. In other words, if the answer is very transparent or absent and the user clicks it, then nothing happens. The user has to click the word when clearly visible so as to proceed to the next scene. "Words fail. There are times that even words fail. What is one to do then until they come again?", as Beckett says in his text.

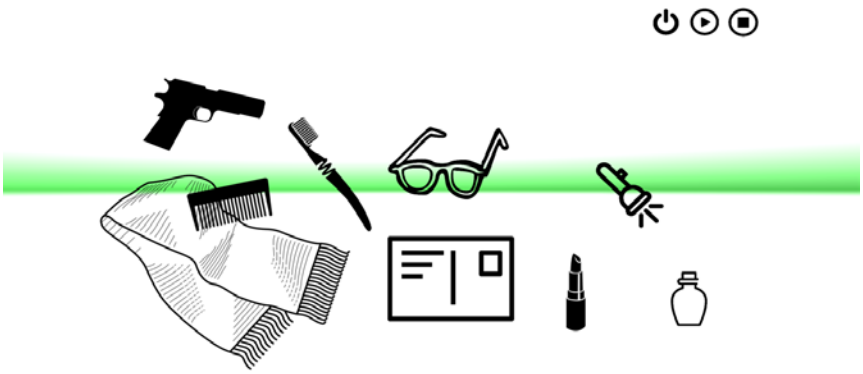


Figure 34 the interactive sound composition Unity scene

Among the elements chosen from S. Beckett's play, there is also an ant that comes out of nowhere and disappears the same way. It is like a hint of life in Winnie's immovable repeatability. Therefore, in some scenes the moving ant works as a trigger. The user proceeds to the next scene, only if it manages to click the ant.

Figure 35 the ant Unity scene

Another element that I tried to incorporate, is the "bell for sleep" that Beckett mentions in his text. The bell rings, Winnie wakes up, says "Another heavenly day is here", she waits for the bell for sleep to ring, the bell rings, she sleeps, the day is off, the day comes again and so on. I tried to give this day on-day off sense with the fade in-fade out of the light.

Figure 36 the ant Unity scene – light fading out

As being understood although the main focus of this experiment is on how objects can resonate, this experiment is also a very nice opportunity to work on the dramaturgy of Beckett's Happy Days and try to translate some basic elements in a visual and acoustic digital environment, always under the umbrella of interactivity. Winnie sings only at the end of the play, so I thought it would be interesting to investigate a path until the sound composition scene that only if one followed could take them to the composition itself. "To sing too soon is fatal", as Winnie says.

My performance in this experiment is limited only at the voice recordings, so I asked myself "Could this experiment be incorporated in the final performance? And if yes, how could it?" The answer was that it could be offered to spectators at the foyer, while waiting for the performance to start. There could be some screens with headphones that people could use as a way to familiarize with Beckett's world and the performance that would follow.

II.B.1.c. Arduino - SuperCollider communication

How could objects resonate in a 3d world? How could the 2d interactive sound composition Unity scene be transferred in the 3d installation of the performance? I then imagined there could be real objects placed in the installation, where the spectators could navigate freely and touch them:

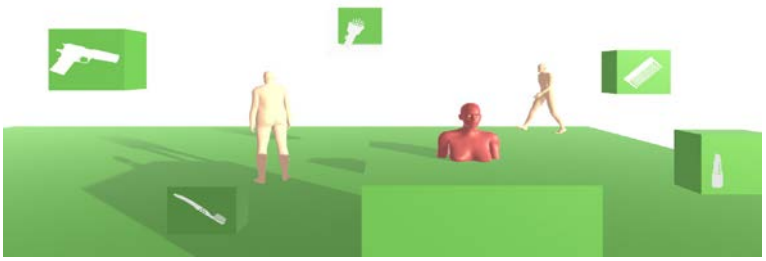


Figure 37 A **simulation** of the installation of the performance

The above picture shows Winnie in her “hole”, the spectators navigating freely in the installation and Winnie’s object (in white) placed in “boxes”. The objects could have sensors or buttons connected to Arduino. When the spectators triggered the sensors, signals could be transmitted to SuperCollider via Arduino. So, an interactive sound composition could be rolling while Winnie could be prattling away in her “hole”. (Of course the whole simulation is just a first attempt to set up the scene on stage and the boxes are just conventions that illustrate position).

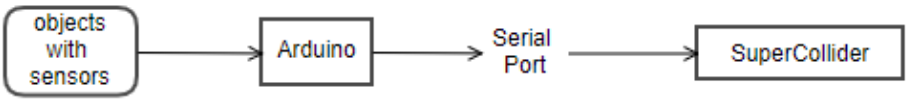


Figure 38 Sound creation path

The first step was to establish communication between Arduino and SuperCollider. To start, I created a simple Arduino circuit, consisting of an Arduino Uno, a small breadboard, one photocell, one pushbutton, two 10kΩ resistances and cables:

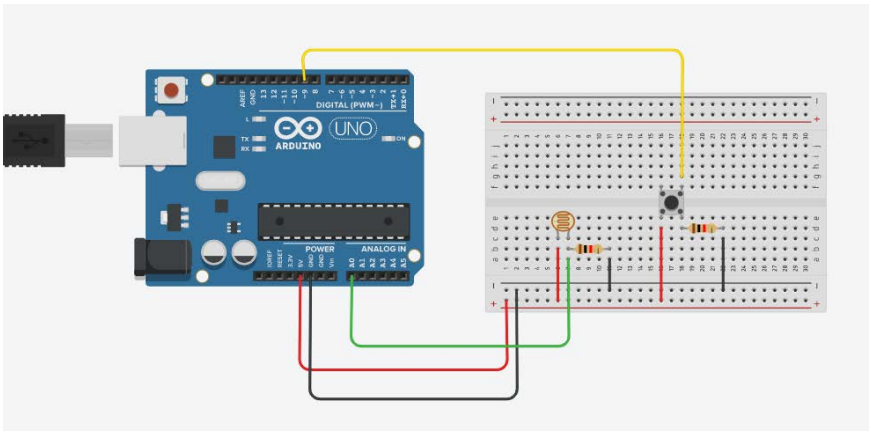


Figure 39 Arduino circuit

Then, I connected Arduino with SuperCollider through serial port communication. Messages were sent successfully to SuperCollider, thus I started creating the musical composition in SuperCollider to see how I could use the incoming data.

In Beckett’s Happy Days Winnie has a music box which plays the melody that she sings at the end of the play. It is a part from the valse song “I love you so” by Franz Lehar that was written for the “Merry Widow” opera. Therefore, I transferred from the piano score written by H.M.Higgs the introduction, one verse and one refrain to SuperCollider.

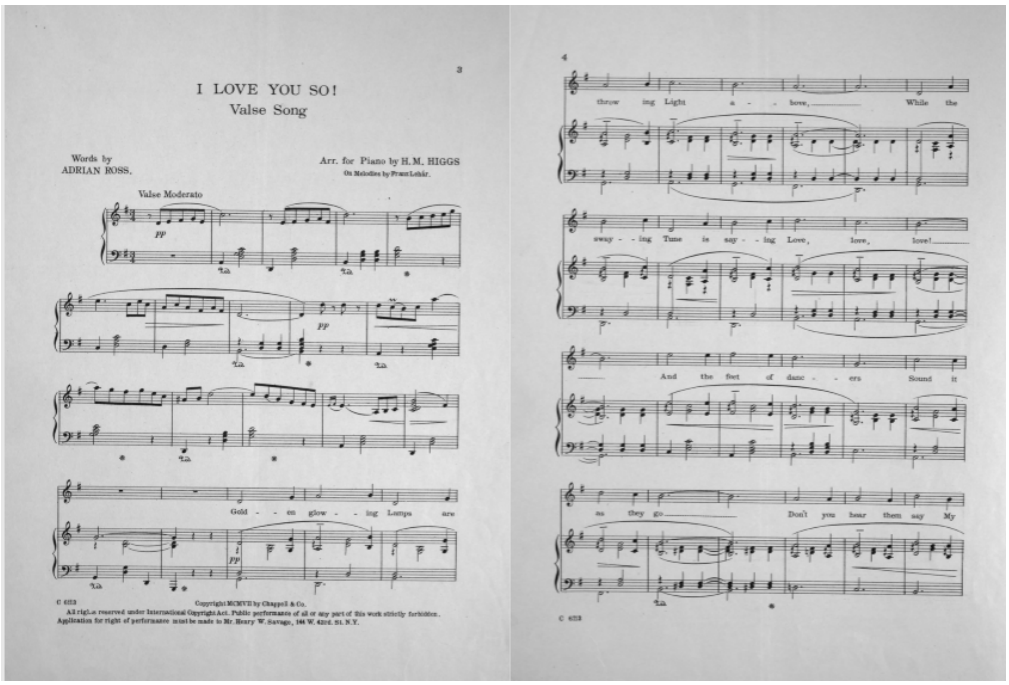


Figure 40 part of the Merry Widow piano score,https://levysheetmusic.mse.jhu.edu/collection/146/187a

The digital score is created mainly with the use of *Patterns* organized in *Pbinds.* I separated the music score in four different "lines" of note sequences (e.g. the upper melody, the soprano voice, the alto-tenor voices and bass) and created four *Pbinds.* Each *Pbind* has a list of different *keys* that correspond to different musical features. For example: the key *degree* represents the notes (i.e. do, re, mi etc), the key *dur* the duration of each note (i.e. note values), the key *amp* the volume (i.e. dynamics) etc. In my digital score the basic keys *degree* and *dur* are consisted of *Patterns (e.g. Pseq, Pn)*, thus sequences of notes and durations. I have not given emphasis on the dynamics, something which for me is one of the most important elements in an interpretation of a music score, because I wanted to simulate the feeling of Winnie's music box. Therefore, I just gave some specific numbers to the *amp* key. I tried, though, to achieve a cozy, sweet sense of the final timbre through *legato* key and the specific instrument I created with the use of a *SynthDef.*

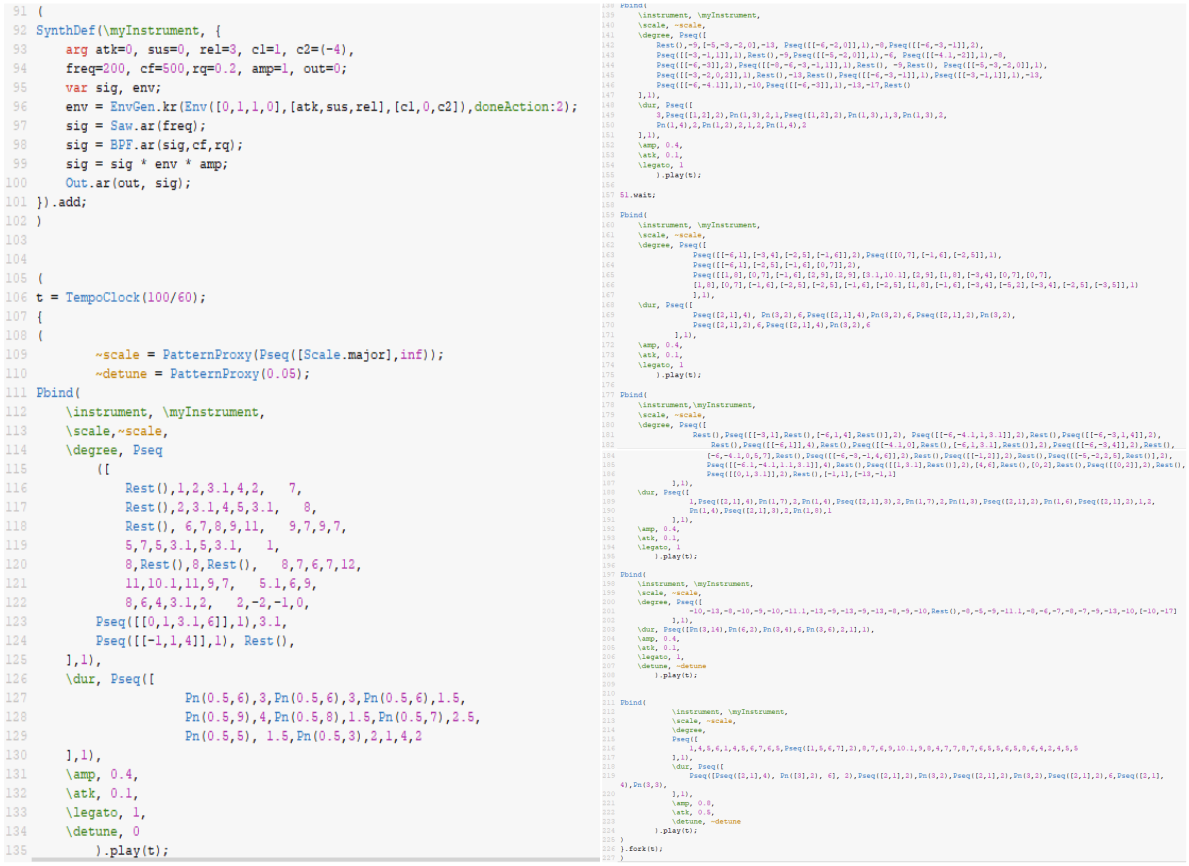


Figure 41 Digital Score created in SuperCollider (see also Appendix)

After creating the digital composition, I tried to figure out how the incoming data from Arduino sensors could be used. For this reason, I used *Pattern Proxies*, which provide access to the "closed circuit" of *Pbinds.* I replaced the *Patterns* of the *scale* and *detune* key with *Pattern Proxies,* as follows:

```
(
        ~scale = PatternProxy(Pseq([Scale.major],inf));
        ~detune = PatternProxy(0.05);
Pbind(
    \instrument, \myInstrument,
    \scale,~scale,
    \degree, Pseq
        ([
```

Figure 42 PatternProxy SuperCollider

Then I used the incoming data from the Arduino photocell and pushbutton as dynamic input values for *detune* and *scale* key respectively:

```
(
Tdef(\detuneControl, {
    {
        ~detune.source = (~photocellVal);
        0.001.wait;
    }.loop;
}).play
)
```

Figure 43 detune control SuperCollider

```
(
Tdef(\scale, {
              {
                if(~buttonVal == 1,
                  {~scale.source = Prand([Scale.minor],inf)},
                  {~scale.source = Pseq([Scale.major],inf)}
                  );
                0.01.wait;
              }.loop;
             }).play
)
```

Figure 44 scale control SuperCollider

For the case of pushbutton, if the button is not pressed the musical composition is played in G major scale. If the button is pressed, then the piece is played in G minor scale.

For the case of photocell, the *detune* key takes the values of the photocell, depending on the amount of light around the cell. For example, if one approaches their hand to the photocell, the amount of light decreases, thus the input value decreases. Low input photocell values result in the creation of lower frequency sounds. High input photocell values result higher frequency sounds (sharp sounds). In any case, the overall result in the musical composition is a sense of detuning, as the key name implies.

All in all, back to our performance, different kinds of sensors could be applied to the objects of the installation, through which spectators could interact directly and affect the performance's sound composition. Thus, while Winnie is prattling away, the spectators can navigate freely in the installation and trigger Winnie's objects to resonate. The spectators become co-creators and can engage in a sound dialogue with Winnie.

II.B.1.d. Android mobile - SuperCollider communication

This experiment was a reflection on the intensive project "Deus Ex Machina" we created with Vanessa Ferle, Anna Gradou and Spyros Tryfonopoulos. It was an experimental AR-VR film for Android mobiles and it was based on an idea of Spyros Tryfonopoulos to

create an application, where users could see through their mobile camera the real world in combination with virtual actions designed in Unity. We created an experimental film where a “god” appears and reveals himself through a sequence of miracles. The virtual god is a video, all the actions are premade in Unity and the music also is prerecorded. Thus, everything is pre-calculated, except from the background that depends on where the user is looking through their camera.

Figure 45 Deus ex Machina

Having already posed to myself the question “How an interactive augmented theater could be”, I used this application to create an interactive mobile sound composition. I created a script in Unity which takes as an input the acceleration of the x axis of the android mobile and sends this data to SuperCollider via OSC protocol. The accelerometer of the mobile gives positive numbers when the rotation is clockwise and negative numbers when the rotation is counterclockwise. I also imported a 3d ant, whose position depends, with a script, on the acceleration of the x axis of the mobile. Thus, the ant follows the rotation of the mobile and creates a sense of a forward or backward slipping movement. At the same time these movements occur, SuperCollider uses the incoming data in a dust generator via OSC protocol. The more the acceleration, the more dust is created. As a result, when the ant “slips” forward there is a lot of dust, when the ant “slips” backward there is not any dust. When there is no rotation at all, there is no dust and the ant is like it is walking on the projected surface. Evidently, when the application is switched off, there is no dust. The prerequisites for this application are two: To have as a port number in Unity’s script the IP of the computer and to connect both devices (laptop and android mobile) to the same Wi-Fi.

Figure 46 Ant android mobile

All in all, Beckett's ant can smoothly be incorporated in the performance and resonate in the installation via interactivity. The 3d ant and the dust sound appear and disappear like the ant in Beckett's Happy Days. What is more, the ant can be projected wherever the spectators want; on Winnie, on the installation, on themselves, on the general environment, provoking a playful mood. In addition, this kind of applications could be interesting solutions on how to bring on stage "live" living creatures, other than humans.

II.B.2. Willie

Could Willie be the audience? This is the basic question that led me to the next experiments. Could the role of Willie be played by the audience? Willie barely speaks at Beckett's Happy Days. He is hidden behind a hill, sleeping or reading his newspaper and only now and then he reads some lines from the newspaper or he replies to Winnie's questions usually in one word. He only goes to meet Winnie at the end of the play and he is too tired even to walk until there. It is very interesting that Winnie is buried in her hole, thus she cannot move to another place whereas Willie has the ability to move around but he chooses to stay at the same spot away from Winnie. Consequently, their distance is like a choice, it is the result of a long-lived marriage, of their tiredness. They are tired of their relationship; they are tired of life in general. The experiments that followed were a three-axis research: 1) Willie's voice, 2) Willie's body, 3) Willie's environment.

II.B.2.a. Willie's voice (Text-to-speech interactive performance)

An interactive performance took place. The installation set up was as follows:

1) A performer on Winnie's role.

2) A wall projection of a Unity environment, which had only a box – Willie's "hole" as Winnie calls it. It was like Willie was inside there, so we could not see him.

3) A laptop with a text-to-speech environment designed in Unity, which wanted to create the sense that now we were inside the box that was projected on the wall. So, inside the box there was Willie. But the spectators could not see his body, because they had his viewpoint. The spectator's body in front of the laptop was Willie's body. In the Unity environment the spectators could write whatever they wanted and their text was translated to sound. Therefore, it was like Willie was talking to Winnie.

Figure 47 Wall projection Unity environment

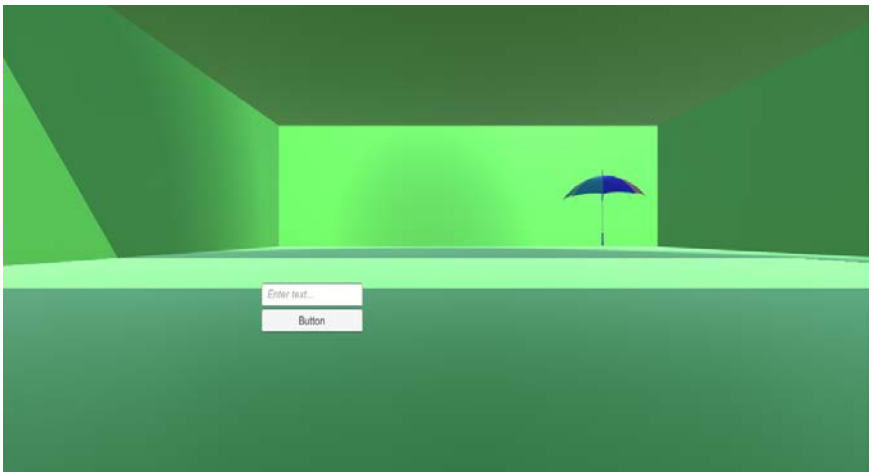


Figure 48 Text-to-speech Unity environment

Winnie in front of the projection, holding her umbrella - another Winnie's personal object according to Beckett's Happy Days - and sitting in her "hole". A spinning colorful umbrella was also put in Willie's "hole" (Text-to-speech environment). Both of them are in their "holes" with their umbrellas-trapped in a similar way.

Figure 49 Performance

Figure 50 Performance

Winnie turns back, trying to see Willie in his "hole", asking him to talk to her. It is the only movement she does. All the other time she keeps sitting.

The performance was based on improvisation, as the previous one. As before, some lines were chosen from Beckett's text. The goal was to communicate with Willie, thus to interact with the audience. The result was interesting. The first spectator that used it kept texting until the end of the performance. She did not leave the laptop, nor did the others apparently search it willingly. This time that I did not orchestrate the performance and I was just playing Winnie's role, not all the spectators interacted. The majority were just watching. Certainly, I did not offer them a lot of time. The performance lasted six minutes. But, I felt it had to stop. There were many problems in this performance. First of all, there was no rhythm. I did not know when exactly the spectator was writing or when she would finally

press enter so that speech would be created. Willie's voice was coming out randomly, most of the times talking over me, so I had to interrupt what I was saying in order to listen to him and react. The first time was interesting because suddenly a voice replied to me out of nowhere, but this went on and it started becoming disturbing to me as a performer, because it was like I was playing on stage with a partner that was not listening to me, thus he was not truly interacting with me. Consequently, although the spectator was interacting with me, the communication was not successful, because of two reasons: 1) the delay between the spectator's decision to interact and the final production of the voice from the application and 2) the spelling errors that sometimes occurred while the spectator was texting that produced incomprehensible sounds. From another perspective, these two elements could insightfully reflect Willie's and Winnie's relationship and communication, as illustrated in Beckett's play. Evaluating the result, the real problem was in my performance. I was not the center of the performance; "the spectator-Willie" was now the central figure in the design of this performance. This happened because I improvised and my acting approach was "realistic", and as we have seen according to Meisner's technique, all one's attention is on their partner. So, as the spectator-Willie was my partner, the performance was trapped in the medium. But, if I had followed a more poetic, abstract acting approach maybe this performance would have been more successful, as I would have been able to control the rhythm of it.

Consequently, the main **feedback** from this experiment was that I should not depend on the spectator's immediate interaction, so as the performance to be evolved. I should create a performance which could be standing on its own and interaction should be added as an extra element, which would enhance the performance, not condemn it.

II.B.2.b. Willie's body - Motion capture

A continuous wondering of how Willie's body could be represented in the performance and my curiosity on how the Motion Capture equipment works led me to the experiment that follows. Could we see Willie walking towards Winnie, as it happens at the end of Beckett's play? I thought that it could be interesting to use Motion Capture equipment, capture my movement as if I was Willie and import this movement to a 3d Willie that could appear on a wall projection. For this first experiment I just captured the movement indicated by Beckett: Willie reading his newspaper and walking to meet Winnie.

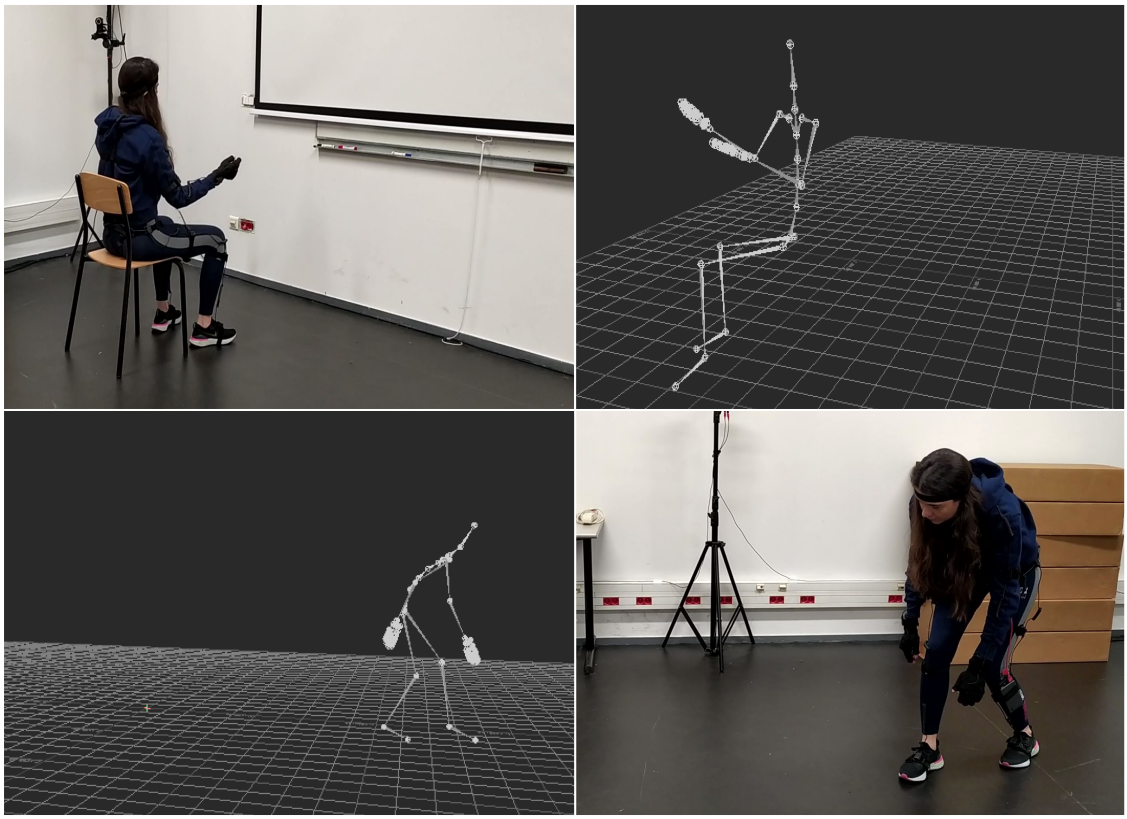


Figure 51 Mocap

This experiment was an opportunity to experiment with the medium itself. Motion Capture is a very interesting tool for performers and is widely used in movies. It requires good knowledge of the medium's restrictions itself, accuracy, clarity and a good sense of one's body. Learning to play for Mocap is a chance to gain consciousness of one's body and movement mechanisms. The possibility of capturing a performer's own motion is thrilling and it can provide inspiration for many projects.

Back to Beckett, I had still to answer the question if I would like a 3d model to represent Willie. Once I had the answer and the final project was defined, then I would have had to work more in detail of what Willie's movement could be. Actors cannot pre-decide on how a role will be represented if the imaginary circumstances are not well defined. Actually, they cannot even decide. Everything is a matter of continuous experimentation of expressing their inner impulse in relation always to their partner and the imaginary circumstances.

II.B.2.c. Willie's environment - Unity live web browsing

After having experimented with motion capture I tried to envision the 3d figure on a 2d projection walking towards Winnie-the live performer. Could a 3d object - even a humanoid one, capture the dramaturgical size of Beckett's Willie? The answer was "No". Then I thought I could use Willie's 3d humanoid in an indirect way. Its shadow. What if in the text-to-speech Unity environment we could see Willie's shadow? It could not be that repelling as a 3d object and it would underline Willie's obscurity. *"In the theatrical medium of Beckett, this trace of presence in the form of an obscure, unreadable and enigmatic object located at the edge of absence, resisting the absolute void, assumes a new dimension in the performance"(Chattopadhyay, 2011).* Therefore, the previous text-to-speech Unity environment was now transformed as follows:

Figure 52 text-to-speech Unity environment

I really liked the visual aesthetic result, but then I wondered: Do I want to use my mocap animation, where Willie is reading his newspaper as indicated in Beckett's play? Is this responding to today's world? Is this compatible to the multimedia performance I want to create which is a reflection of today's new media reality? The answer again was "No". I then asked myself: How could a newspaper be represented nowadays? And the answer of course was the internet. So, I thought it could be interesting to see Willie surfing the net, instead of reading a newspaper. It would be an analog of the false use of media in our lives and our confinement in them, resulting in the loss of true, face-to-face contact. Willie and Winnie are trapped in their "internet holes", communicating through an on-line call or a chat room, avoiding personal contact. And then another question came: What about giving spectators the possibility to surf themselves the net as if they were Willie? So, I installed in Unity a live web browsing plug-in. Here is Willie surfing the net:

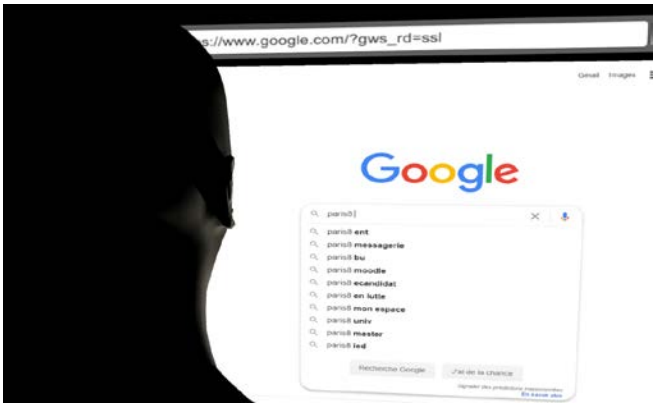


Figure 53 live web-browsing Unity environment

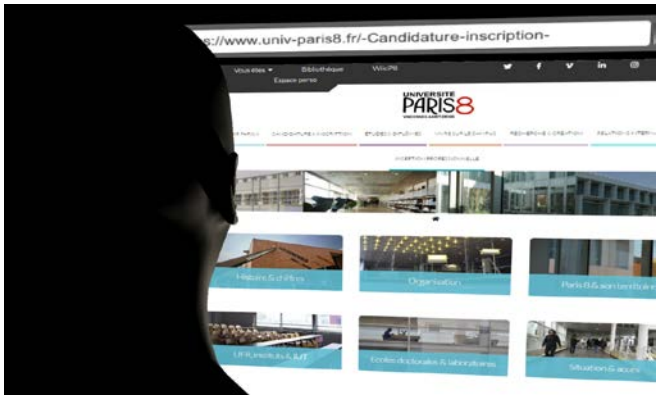


Figure 54 live web-browsing Unity environment

And suddenly, eventually, the final concept of the performance appeared.

II.C. Set up Phase - The WWWeb Ensemble

The minimum decision taken before starting the experimentation phase and the available resources helped me realize this series of experiments which in their turn led me through successive approximations to the final concept. The whole set up will be like a "WWWeb analog". Winnie and Willie are stuck inside the Web. So, how could all previous experiments be combined? Actually, which experiments can finally be used at the final project?

Figure 55 WWWeb Ensemble

Winnie and Willie are in front of their laptops. Willie is surfing the net and Winnie is prattling away waiting for Willie's video call. Willie is texting her now and then, while surfing the net. They are both trapped in their "holes" inside the web's "wilderness". Therefore, we have a web from cables. On the cables there are Winnie's objects, which are connected to the Arduino sensors that send signals to SuperCollider. Thus, spectators can navigate freely and interact with the objects, creating sounds. At the same time, they can also use the Android-SuperCollider application, projecting the ant wherever they want and creating sounds. Lastly, there is a laptop with headphones; Willie's world. Spectators can navigate as if they were Willie, wherever they want. Their choices will be visible to all spectators, so they are co-creators of the visual result of the performance. What is more, if they wear the headphones, apart from being able to listen to live streaming sounds, they would also discover that even the laptop's keyboard resonates. That is a new idea that came in mind, while wondering how I could connect everything to SuperCollider so that everything on stage could resonate live. Consequently, I thought about creating a keyboard musical instrument. In the live web browsing Unity environment I would add some scripts and every time a button is pressed, a signal will be transmitted to SuperCollider and a sound will be created. Consequently, apart from the overall sound composition of the performance, the spectators could also create their personal musical composition. This live sound creation, could also work as an accompaniment to the existing performance's composition. It would be like the spectators interact (silently - only in their headphones) with the overall

composition via their musical instrument - the laptop. All in all, an ensemble of different musical instruments will resonate in the web's "wilderness".

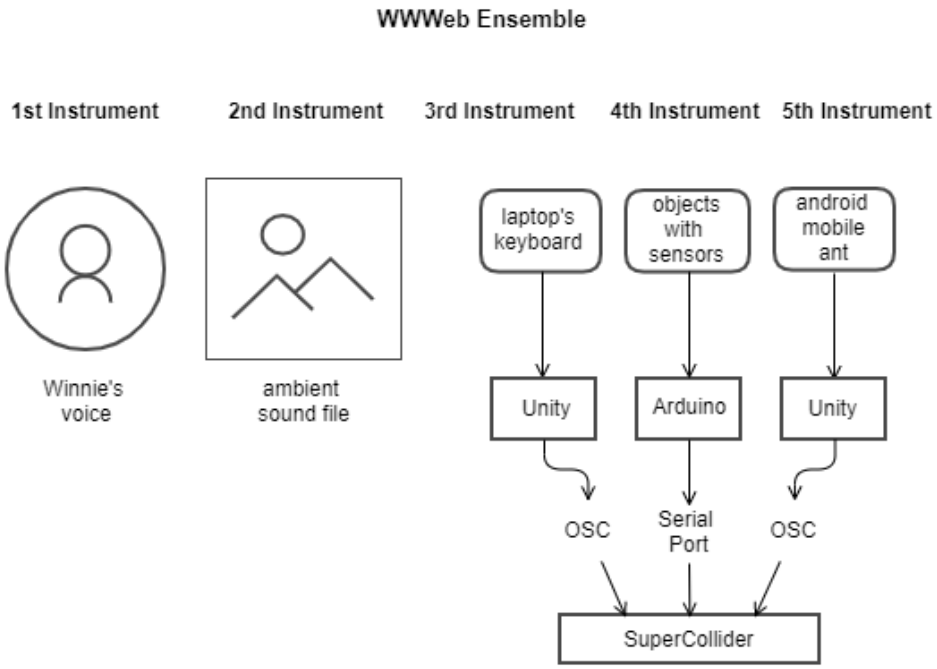


Figure 56 The Instruments

Winnie's voice is the basic instrument that along with the ambient sound file, which will be created, establish the desirable atmosphere and of course the rhythm of the performance. The other three instruments are played by the spectators and enhance the overall musical result. What has remained now is to check what is already made and what has to be made in order to complete the designing of the performance.

II.D. Retreat

And suddenly, all the available resources changed abruptly. The COVID-19 is our new reality. All public events were cancelled and after some days almost all the world was in mandatory home confinement for two months. Only specific workers were allowed to go to work physically; the majority was either telecommuting or "resting" home and taking allowances from each country's government. Evidently, performances were prohibited and even after the confinement big festivals are so (e.g. the Avignon festival is cancelled). During the confinement many past recorded theatrical performances were uploaded on Internet for some days, or even live streaming video emissions took place. Theater became a thing of the

past and it will remain so for some time; concerts too. Performers are urged to invent new ways of contacting with their audience.

Taking into consideration the whole situation and due to the existent restrictions and difficulties, I decided I had to make use of the *heuristic: Always give yourself a chance to retreat.* I had to take some moments of observation and absorption of the new data.

Retreat Q&A Series:

- Questions: 1) What is happening? 2) What media have been emerged? 3) Do I want my performance to be a result of forced compromise (the theater I intended to do my performance is closed, material I had ordered never reached me, people with masks and plastic gloves afraid to touch shareable objects)? 4) Can I redesign my performance without costing (time and money)? 5) Can I use some of the basic ideas and realized experiments? 6) Can I make good use of the available resources and not be stuck in difficulties? 7) Can the new performance be safe for everyone and at the same time bear artistic value?
- Answers: 1) Social distancing, physical space is suffering, people are wearing masks and gloves. 2) Live streaming. 3) No. 4) Yes. 5) Yes. 6) Yes. 7) Yes.
- Last crucial question that if not answered retreat is impossible: Can the new performance be interactive?
- Triggering answer: Yes.

II.E. New Set up - The interactive live streaming performance: Happy 365

Happy 365 is an interactive live streaming performance on social media – in particular, Facebook. It is based on the idea that Willie is surfing the net, thus the spectators have the role of Willie and Winnie talks to them via the camera. Interactivity is achieved through one of the basic communicative elements of Facebook: comments. The performance's set up is a performer - Winnie in front of a video projection. The video projection is the live web browsing Unity environment plus a text box. Winnie is exactly in front of the text box - metaphorically her "hole".

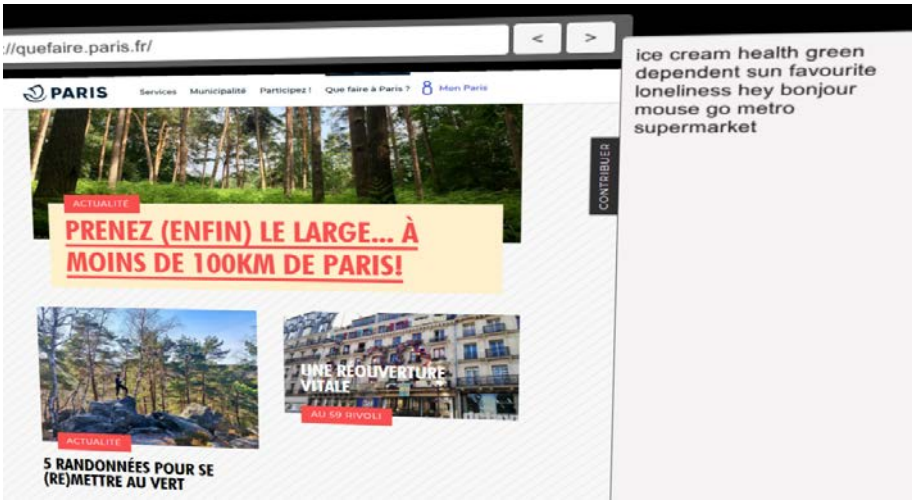


Figure 57 Unity Live Web browsing + Text Box

At the announcement of the live streaming, the participants are invited to interact by writing as a comment only one word (one important word for them) or a url link (except from sound link e.g. youtube). The idea of commenting one important word is taken from the very first experiment of this research. The words, except from being written in the Unity box (thus appeared in the projection), they also created live sounds. The previous idea of transforming the laptop's keyboard into a musical instrument was implemented in Happy 365. There was a script in Unity that connected SuperCollider via OSC. Whenever the letters of the keyboard were pressed, they triggered live sound production in SuperCollider via an OSCdef called "letters". The sounds' frequencies and durations were random, within a range I had pre-decided.

```
(
OSCdef('letters',{
    Pbind(
    \instrument, \words,
    \freq, Pwhite(50, 800, 1 ),
    \dur, Pwhite(0.05, 4, 1),
    \amp, 0.8,
    \rel, 2,
    \atk, 1,
    \detune, 0.1
).play;
}, "letters");
)
```

Figure 58 SuperCollider letters' sounds

The whole performance lasted 6 minutes and it was "orchestrated" by a 6 minutes sound file. This sound track was created in Audacity and it was a composition based on the Merry Widow digital score "I love you so" that was created in SuperCollider, as previously seen. The concept of the sound track was to illustrate how the song, finally Winnie sings at the end of

the play, “bubbles up, for some unknown reason the time is ill chosen, one chokes it back”. The whole monologue is a path to reach finally the song. Therefore, the musical composition follows the same logic. It is a back and forth movement of the musical score. It uses patterns that evolve, but don’t fully elaborate until the time has come for the song to be sung, thus heard. At the end of the performance that Winnie reaches the moment when the “song pours out of the inmost”, the musical score is finally fully heard. As Winnie says: “One cannot sing just like that. No. Song must come from the heart”.

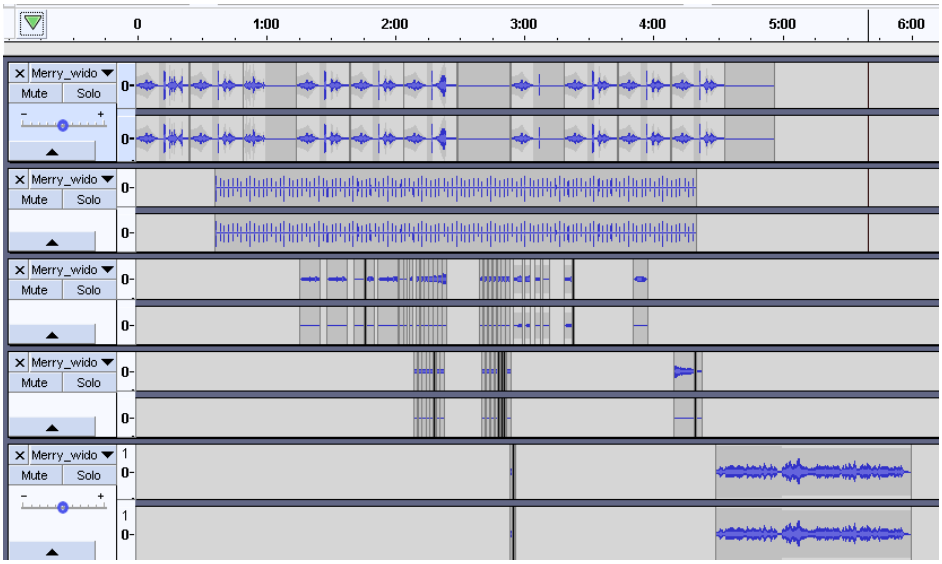


Figure 59 Audacity Score

The backstage and stage set up was as follows:

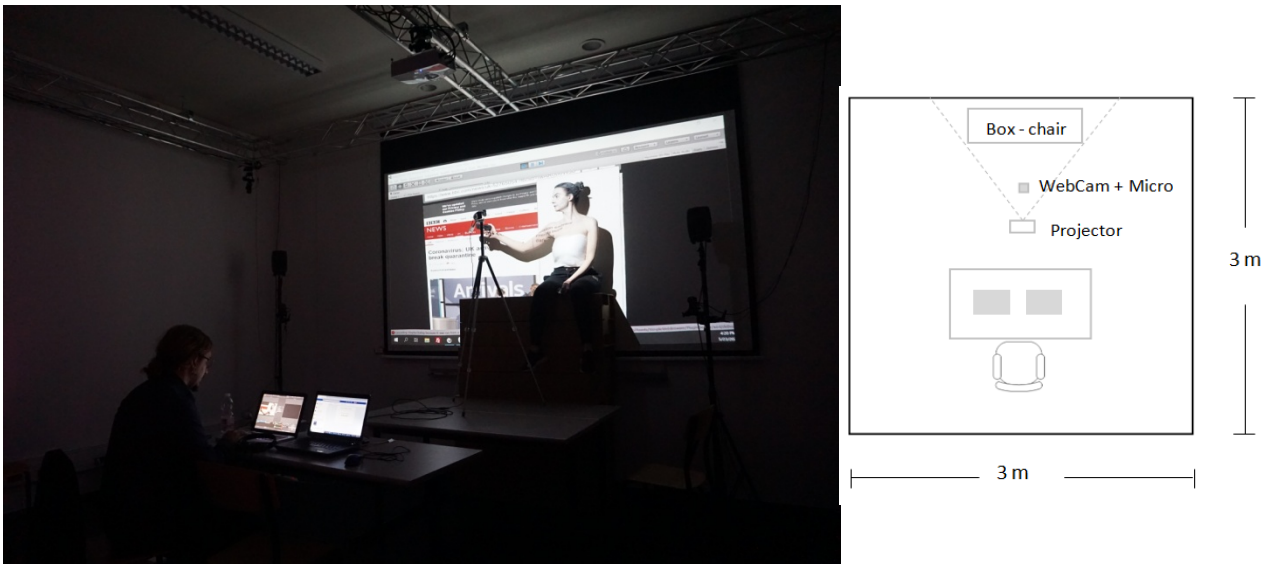


Figure 60 Happy 365 – The Set Up

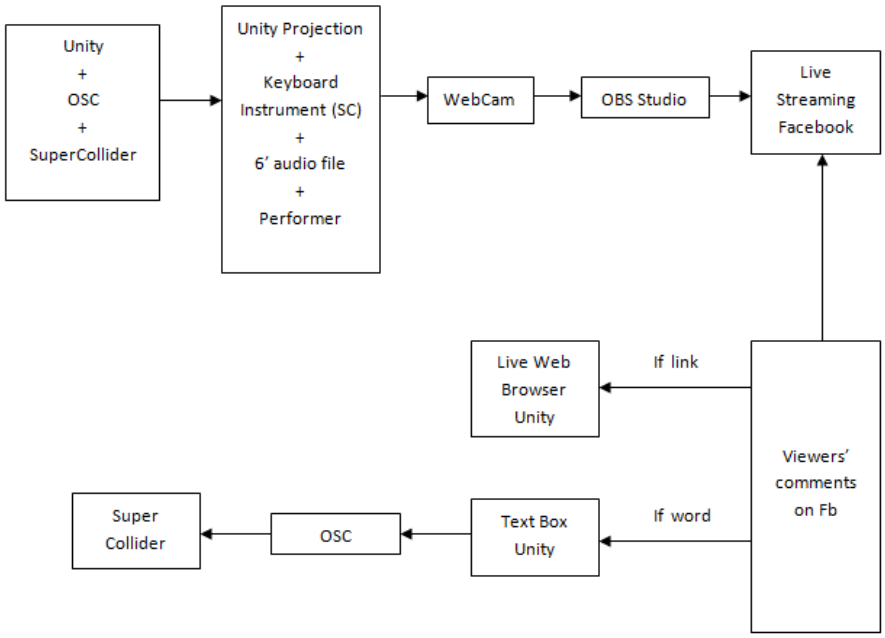


Figure 61 Happy 365 Flow Diagram

The live streaming and the comments of the spectators were handled by Juan Patricio Di Bacco via OBS Studio. He was the audio and video operator of the performance. We used a projector, a web camera and two laptops (one for streaming and one for running Unity, SuperCollider, the sound file and viewing the comments).

The acting approach was realistic and at times poetic. It had to be immediate, because I wanted to give the sense of proximity, so as to make spectators want to interact with me. At the same time, due to the fact that there was only one frame and I was static, I chose to be more expressive than usual in front of the camera. Whenever I leaned closer to the camera, I degraded my gestures. In order to illustrate the eerie world of Beckett I also combined poetic movements with realistic facial and vocal expressions. Furthermore, I painted my face, body and hair white and I wore a white costume. I chose one of Winnie's basic objects: her gun, and incorporated it in my interpretation. In fact, it was my partner on stage. Even when it was not shown to the camera, it always remained in my hands, as a constant threat, as my favorite object.

II.F. Presentation phase

Live streaming:

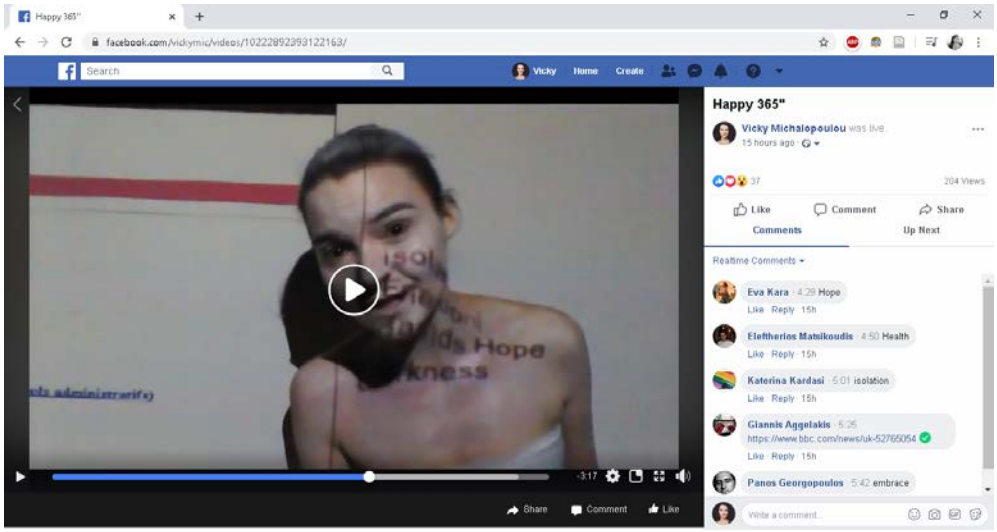


Figure 62 Facebook Video from Live Streaming

Comments:

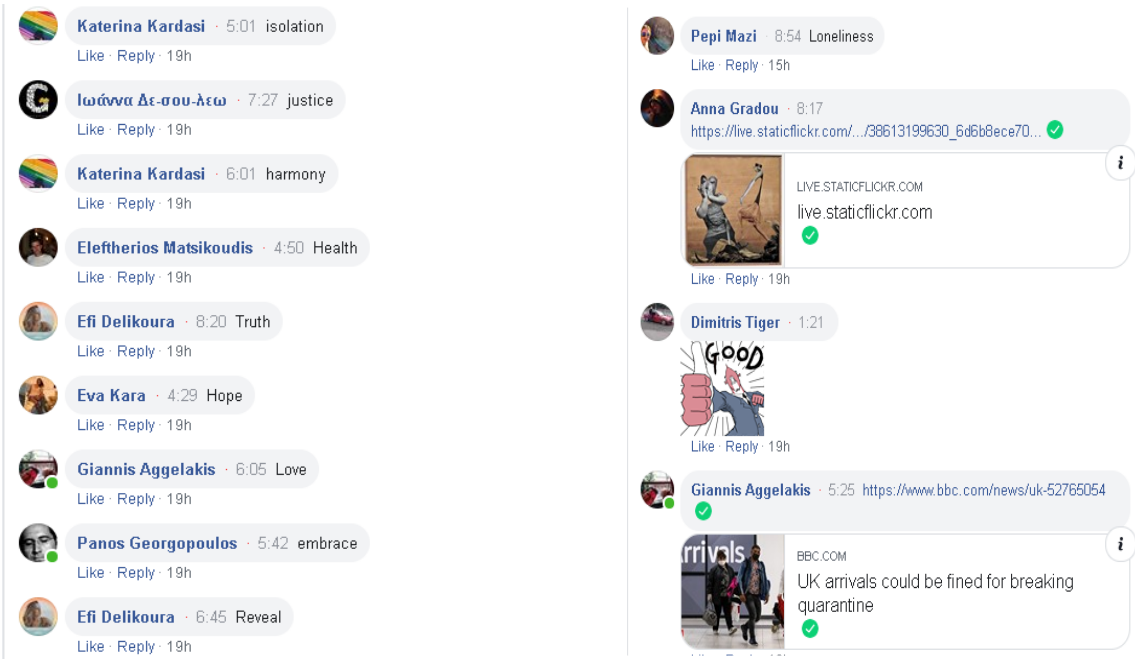


Figure 63 Comments on Facebook Live Streaming

Video result:

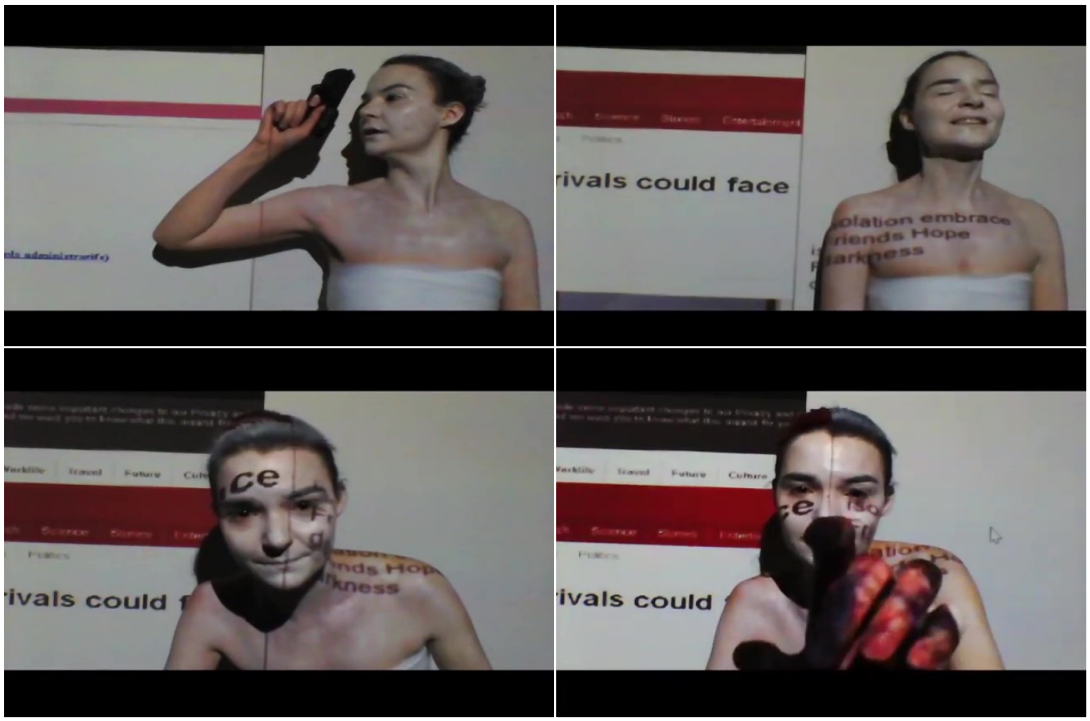


Figure 64 Screenshots from Happy 365

II.F.1. Analysis of the result

- ***Spectator's view***

The general feedback was good. Some fruitful viewpoints:

- "I liked the aesthetics and the fact that the projection was on your body. I liked that you took the comments from their Facebook frame and you projected them elsewhere. Someone who watches the final video does not know if it is from Facebook. I liked that the links we sent, appeared on the background, but I think I would want more specific rules on the content of the links. For example, the BBC link distracted my attention, because I thought it was irrelevant. Furthermore, the fact that we could send comments whenever we wanted made me feel confused about where I should pay attention; the performance or the comments. I would like you had given more guidance on what was more important. I think that if the duration of the performance was longer, I would have familiarized with the flow and I could have watched it normally. In general, I am confused when there is interaction, because I think a lot what I have to do". (Anna)

- "Acting and music were amazing. The whole result was minimal. The face looked unearthly in a good sense. I liked that the rhythm of the performance was chill and did not follow the

fast speed of the digital world, though I think the words should appear on your body faster. One had to wait until to see their comment written". (Katerina)

- "Acting was superb, but I was a little bit lost from start to end". (Eleftherios)
- "Although I am not an expert, I think your acting was very good. The only problem was that I couldn't understand what you were saying because the sound was blurry and I had my attention on what I could comment, so I missed some lines. But, it was interesting that you used the projection on the actor and this kind of visualization of comments". (Ioanna)
- "I found the whole concept very original. The acting was fantastic. I liked the projection of the words on your body, but I couldn't see the whole links on the background, ie I understood something more existed that I could not see. Also, the sound was not best quality. Overall it was very beautiful." (Elena)

- ***Performing engineer's view***

I believe that the experiment was successful, because within the available resources it covered the basic requirements of my approach that lead to a poor interactive multimedia theater. Surely, there were many technical problems (special sound equipment was missing, the operation of all media was performed only by one person - Juan Patricio Di Bacco, we had a delay in receiving the comments online - probably because of a lag of my own computer), but we managed to conduct the performance from beginning to end as I had envisioned. The sound was not excellent, but it was audible. Undoubtedly, it was technically poor - with the bad sense. On the other hand, artistically, it was - also undoubtedly - a poor interactive multimedia theater. That means a theater that has in its core the actor, interacts with the spectator and follows the aesthetics of postdramatic theater (e.g. eventness). This can also be assumed from the spectators' feedback. The majority of people mentions the effectiveness of the actor's performance, the good aesthetics and analyzes their role in the performative process. Furthermore, Beckett's world was smoothly portrayed in different ways: an incomprehensive frame, an eerie white face with very black eyes (because of the projector's light), words that came from nowhere and resonated in an already resonating atmosphere. Finally, the whole project was innovative as no such performance had existed before, as far as I have searched.

II.G. Retrospection and points to ameliorate

Taking into consideration the spectators' feedback, there are beautiful conclusions related to interactivity. Interaction is not a simple issue, mostly because each person interacts differently even in their personal lives and unconsciously have expectations on how interaction should be. Some people feel that interactivity should be guided. They wait for the performer's feedback. They have a critical attitude towards what suits and what does not suit the performance and might even judge other spectators' choices. Others want quick results. Some feel that if they make a choice, they will miss something else. A great amount of people is even afraid to interact. In every interactive performance some choices have to be made. My choice was to leave the spectators act freely within two basic instructions: 1) write only one word that is important for you and 2) send whatever link you desire, preferably not a audio link. I had no problem to put as a background or write whatever they wanted, as long as it followed these rules. For the sake of this specific performance that was based on S. Beckett's play "Happy Days", the more irrelevant was a comment, the better illustrated Winnie's and Willie's relationship and Beckett's absurdity. Also, I chose not the whole browser to be seen, so as for the spectators to understand that it is not the information that matters, but the visual effect of their links. For example, here is an interesting visual effect from the general rehearsal:

Figure 65 Rehearsal

There were many possibilities for the spectators to experiment. True thing is that the performance was not very long and the spectators had no time to familiarize with it. That is why I named it Happy 365. It is of course a pun on the 365 days of a year referring to Happy Days, but I also wanted to illustrate its shortness (365 seconds) and at the same time the

joyfulness it could offer. Our lives are consisted of moments that usually pass so quickly, that there is no time to understand them completely until we decide to act. Some of the happiest moments usually are unexpected, incomprehensible, unpredictable, short and spontaneous. My purpose was to give 365 seconds of happiness - the happiness of meeting together online and co-creating via interactivity. The only thing I could have done differently was to put as first background link something really weird and colorful, like on the rehearsal. This way, the visual effect could have been more interesting from the beginning of the performance and I could have shown to spectators that my true intention was absurdity to the maximum. I did not pay a lot of attention to this element, but I think it was finally equally important.

I think this experiment was a good start. In order to get evolved, two basic changes are needed: better equipment and longer duration. Also, I believe one more person is needed for the operation of the live streaming and the input from the spectators.

Conclusion

This study has shown that incorporating new technologies in a performance based on a theatrical play is a complicated procedure that requires multiple abilities. One has to research a lot the play's dramaturgy and aesthetics, be aware and have knowledge of the existent new technologies, experiment a lot before reaching the final concept, do not be afraid to fail and retry etc. In addition, in the case of a performing artist who wants to create their personal artistic statement, things become even more complex, because they have to deal with everything and at the same time perform. For this reason, a method is needed. My personal background led me unconsciously to the Engineering Method and as a result to the Performing Engineer's Technique. Through successive approximations of the question "What do I do" I created a number of applications that can be composed differently and create even different projects. In this study two projects immerged: The WWWeb Ensemble and Happy 365. If I had not asked myself continuously the question "What do I do", Happy 365 would not have immerged. I would have probably tried to create The WWWeb Ensemble as much as the existent circumstances allowed. I believe the WWWeb Ensemble should be performed in the future when the existent conditions would be more appropriate. Problem solving approach helped me create a project I probably would have not thought and led me to a more challenging path as I was walking Towards a Poor Interactive Multimedia Theater. New technologies offer countless possibilities, as they never stop evolving. We should work knowingly with them in theater, so as not to be overtaken. Continuous research is the key word to evolution in every domain, but this requires awareness. Personally I believe that when science and art collaborate, the results can be surprising.

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Table of figures

Appendix

Merry Widow Digital Cover in SuperCollider

Merry_Widow_Arduino_Cover.scd

```
87 ////////////////////////////////////////////////
88 ///////////the merry widow cover///////////////
89 ////////////////////////////////////////////////
90
91 (
92 SynthDef(\myInstrument, {
93     arg atk=0, sus=0, rel=3, cl=1, c2=(-4),
94     freq=200, cf=500,rq=0.2, amp=1, out=0;
95     var sig, env;
96     env = EnvGen.kr(Env([0,1,1,0],[atk,sus,rel],[cl,0,c2]),doneAction:2);
97     sig = Saw.ar(freq);
98     sig = BPF.ar(sig,cf,rq);
99     sig = sig * env * amp;
100    Out.ar(out, sig);
101 }).add;
102 )
103
104 (
105 t = TempoClock(100/60);
106 {
107 (
108         ~scale = PatternProxy(Pseq([Scale.major],inf));
109         ~detune = PatternProxy(0.05);
110 Pbind(
111     \instrument, \myInstrument,
112     \scale,~scale,
113     \degree, Pseq
114         ([
115             Rest(),1,2,3.1,4,2,   7,
116             Rest(),2,3.1,4,5,3.1,   8,
117             Rest(), 6,7,8,9,11,   9,7,9,7,
118             5,7,5,3.1,5,3.1,   1,
119             8,Rest(),8,Rest(),   8,7,6,7,12,
120             11,10.1,11,9,7,   5.1,6,9,
121             8,6,4,3.1,2,   2,-2,-1,0,
122         Pseq([[0,1,3.1,6]],1),3.1,
123         Pseq([[-1,1,4]],1), Rest(),
124     ],1),
125     \dur, Pseq([
126                     Pn(0.5,6),3,Pn(0.5,6),3,Pn(0.5,6),1.5,
127                     Pn(0.5,9),4,Pn(0.5,8),1.5,Pn(0.5,7),2.5,
128                     Pn(0.5,5), 1.5,Pn(0.5,3),2,1,4,2
129     ],1),
130     \amp, 0.4,
131     \atk, 0.1,
```

```
    \legato, 1,
    \detune, 0
        ).play(t);



Pbind(
    \instrument, \myInstrument,
    \scale, ~scale,
    \degree, Pseq([
        Rest(),-9,[-5,-3,-2,0],-13, Pseq([[-6,-2,0]],
1),-8,Pseq([[-6,-3,-1]],2),
        Pseq([[-3,-1,1]],1),Rest(),-9,Pseq([[-5,-2,0]],1),-6,
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Pseq([[-5,-3,-2,0]],1),
        Pseq([[-3,-2,0,2]],1),Rest(),-13,Rest(),Pseq([[-6,-3,-1]],
1),Pseq([[-3,-1,1]],1),-13,
        Pseq([[-6,-4.1]],1),-10,Pseq([[-6,-3]],1),-13,-17,Rest()
    ],1),
    \dur, Pseq([
        3,Pseq([1,2],2),Pn(1,3),2,1,Pseq([1,2],2),Pn(1,3),1,3,Pn(1,3),2,
        Pn(1,4),2,Pn(1,2),2,1,2,Pn(1,4),2
    ],1),
    \amp, 0.4,
    \atk, 0.1,
    \legato, 1
        ).play(t);

51.wait;

Pbind(
    \instrument, \myInstrument,
    \scale, ~scale,
    \degree, Pseq([
                Pseq([[-6,1],[-3,4],[-2,5],[-1,6]],2),Pseq([[0,7],[-1,6],
[-2,5]],1),
                Pseq([[-6,1],[-2,5],[-1,6],[0,7]],2),
                Pseq([[1,8],[0,7],[-1,6],[2,9],[2,9],[3.1,10.1],[2,9],
[1,8],[-3,4],[0,7],[0,7],
                [1,8],[0,7],[-1,6],[-2,5],[-2,5],[-1,6],[-2,5],[1,8],
[-1,6],[-3,4],[-5,2],[-3,4],[-2,5],[-3,5]],1)
                ],1),
```
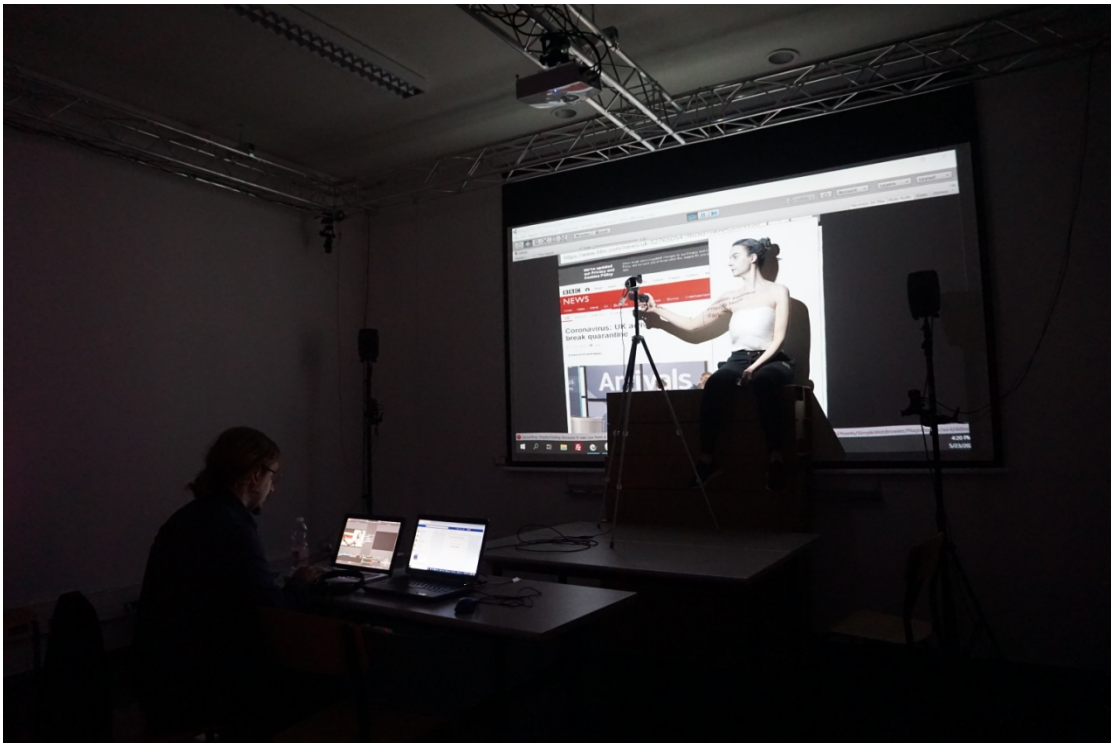
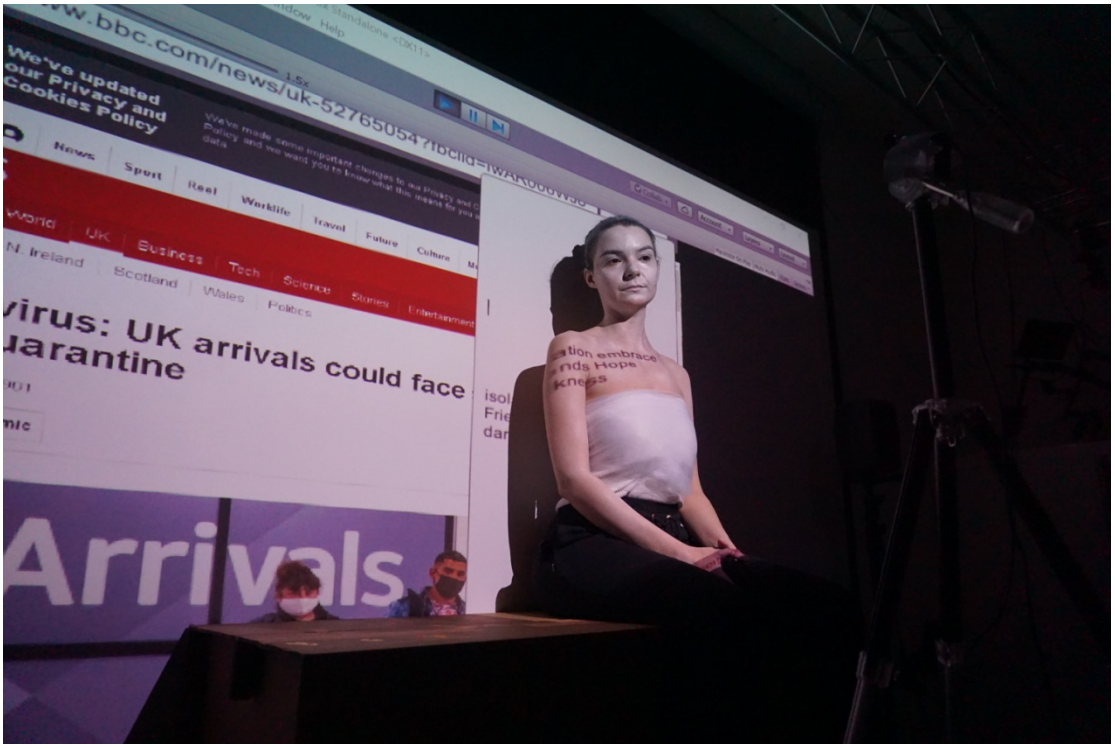

```
168     \dur, Pseq([
169                 Pseq([2,1],4), Pn(3,2),6,Pseq([2,1],4),Pn(3,2),
    6,Pseq([2,1],2),Pn(3,2),
170                 Pseq([2,1],2),6,Pseq([2,1],4),Pn(3,2),6
171             ],1),
172     \amp, 0.4,
173     \atk, 0.1,
174     \legato, 1
175         ).play(t);
176
177 Pbind(
178     \instrument,\myInstrument,
179     \scale, ~scale,
180     \degree, Pseq([
181                 Rest(),Pseq([[-3,1],Rest(),[-6,1,4],Rest()],2),
    Pseq([[-6,-4.1,1,3.1]],2),Rest(),Pseq([[-6,-3,1,4]],2),
182                     Rest(),Pseq([[-6,1]],4),Rest(),Pseq([[-4.1,0],Rest(),
    [-6,1,3.1],Rest()],2),Pseq([[-6,-3,4]],2),Rest(),
183                     Pseq([[-6,-4.1,1,3.1]],2),Rest(),Pseq([[-6,-3,1,4]],
    4),Rest(),[-5,-3,0,4,7],Rest(),
184                     [-6,-4.1,0,5,7],Rest(),Pseq([[-6,-3,-1,4,6]],
    2),Rest(),Pseq([[-1,2]],2),Rest(),Pseq([[-5,-2,2,5],Rest()],2),
185                     Pseq([[-6.1,-4.1,1.1,3.1]],
    4),Rest(),Pseq([[1,3.1],Rest()],2),[4,6],Rest(),[0,2],Rest(),Pseq([[0,2]],
    2),Rest(),
186                     Pseq([[0,1,3.1]],2),Rest(),[-1,1],[-13,-1,1]
187             ],1),
188     \dur, Pseq([
189                 1,Pseq([2,1],4),Pn(1,7),2,Pn(1,4),Pseq([2,1],3),2,Pn(1,7),
    2,Pn(1,3),Pseq([2,1],2),Pn(1,6),Pseq([2,1],2),1,2,
190                 Pn(1,4),Pseq([2,1],3),2,Pn(1,8),1
191             ],1),
192     \amp, 0.4,
193     \atk, 0.1,
194     \legato, 1
195         ).play(t);
196
197 Pbind(
198     \instrument, \myInstrument,
199     \scale, ~scale,
200     \degree, Pseq([
201
    -10,-13,-8,-10,-9,-10,-11.1,-13,-9,-13,-9,-13,-8,-9,-10,Rest(),-8,-5,-9,-11
    .1,-8,-6,-7,-8,-7,-9,-13,-10,[-10,-17]
202             ],1),
```

```
    \dur, Pseq([Pn(3,14),Pn(6,2),Pn(3,4),6,Pn(3,6),2,1],1),
    \amp, 0.4,
    \atk, 0.1,
    \legato, 1,
    \detune, ~detune
        ).play(t);


Pbind(
            \instrument, \myInstrument,
            \scale, ~scale,
            \degree,Pseq([1,4,5,6,1,4,5,6,7,6,5,Pseq([1,5,6,7],2),
8,7,6,9,10.1,9,8,4,7,7,8,7,6,5,5,6,5,8,6,4,2,4,5,5],1),
            \dur, Pseq([
                Pseq([Pseq([2,1],4), Pn([3],2), 6], 2),Pseq([2,1],
2),Pn(3,2),Pseq([2,1],2),Pn(3,2),Pseq([2,1],2),6,Pseq([2,1],4),Pn(3,3),
            ],1),
            \amp, 0.8,
            \atk, 0.5,
            \detune, ~detune
        ).play(t);
)
}.fork(t);
)
```

Photos from Happy 365 backstage

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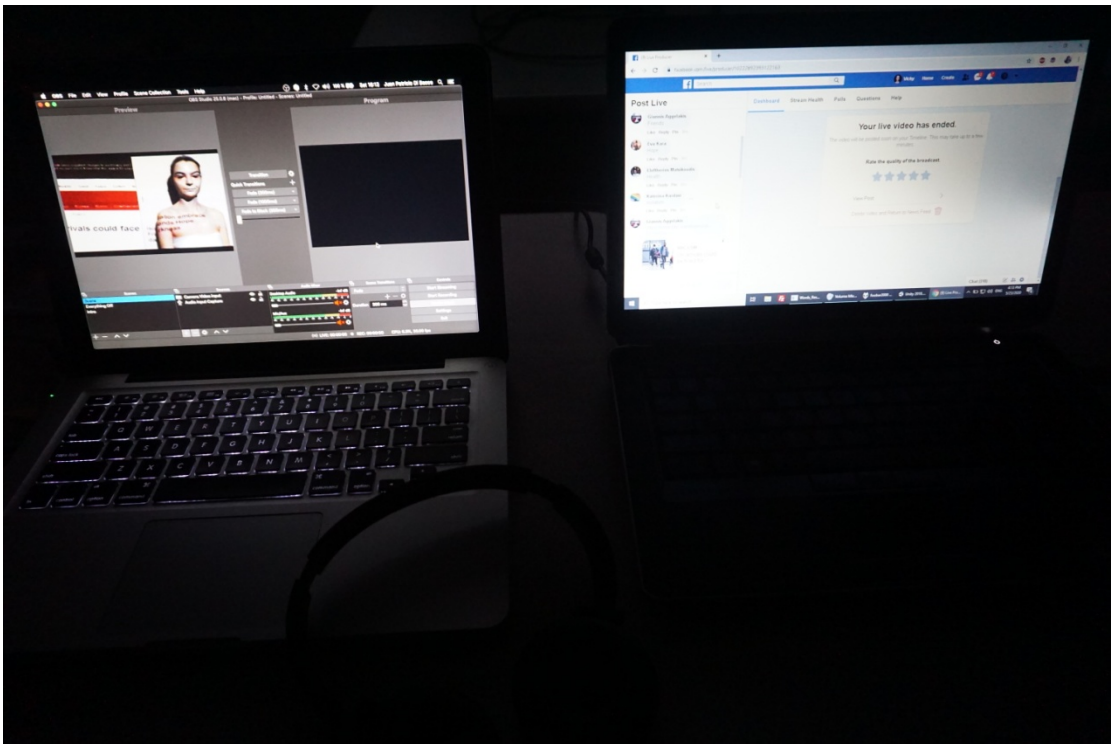
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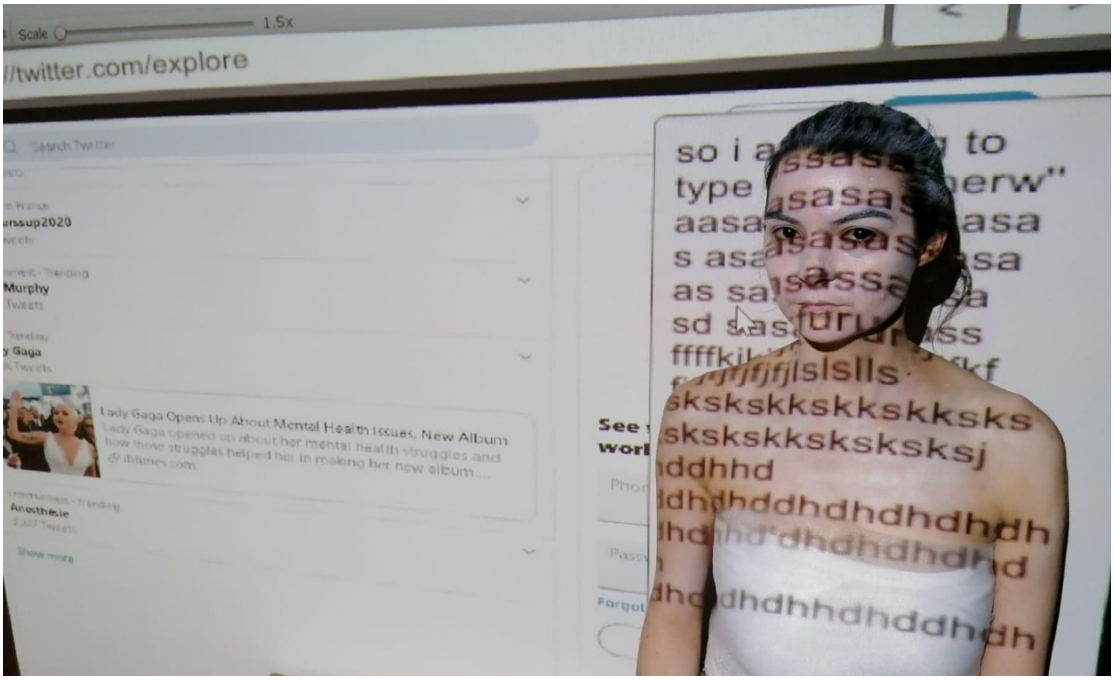

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