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MUYBRIDGE-500: JOG-SHUTTLE AS AN OPERATIONAL MODE OF THE DIGITAL

A Master's Thesis

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MUYBRIDGE-500: JOG-SHUTTLE AS AN OPERATIONAL MODE OF THE DIGITAL

The Graduate School of Economics and Social Sciences
of
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July 2018

I certify that I have read this thesis and in my opinion it is fully adequate, in scope and in quality a thesis for the degree of Master of Fine Arts in Media and Design.

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ABSTRACT

MUYBRIDGE-500: JOG-SHUTTLE AS AN OPERATIONAL MODE OF THE DIGITAL

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This thesis investigates the mode of operation of jog-shuttle as a dial in videotape editing technology and its way of operation. With the development of the technology, the upgrade culture turns the media devices into obsolete devices. Jog-shuttle as a physical dial which is found in the Bilkent Media Archaeology Lab is one of these devices. With the project, *Muybridge-500* as an interactive installation, this thesis creates a rescue operation by transferring the mode of operation from analog to digital. This project by mimicking the device's mode of operation without using it's tactility, turns the jog-shuttle into a zombie media device. The recalling process saves the device from becoming obsolete and contributes to contemporary media by introducing a new mode of operation.The touchless operation by gestures of the new jog-shuttle is constructed with media archaeological gaze which demonstrates the

non-linearity of the media. This knowledge transference takes again the analog device's operation as a bodily action and forms a new mode of operation which affects the decision making process during the interaction.

Keywords: Gesture, Interactive Design, Media Archaeology, Mode of Operation, Motion Sensors

ÖZET

MUYBRIDGE-500: BİR DİJİTAL KULLANMA ŞEKLİ OLARAK JOG-SHUTTLE

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Bu tez Jog-Shuttle'ın video kaset montaj/düzenleme teknolojisi alanına ait, belli bir kullanıma sahip olan "kadran" olarak çalışma şeklini incelemektedir. Teknolojinin gelişmesiyle birlikte, güncelleme kültürü medya cihazlarını eski, hükümsüz cihazlara dönüştürmektedir. Media Arkeoloji Laboratuarı'nda fiziksel bir araç olarak bulunan jog-shuttle, bu cihazlardan biridir. Bu tez, etkileşimli yerleştirme olan *Muybridge-500* projesi ile, kullanım şeklini analogtan dijitale çevirerek bir kurtarma operasyonu yaratmaktadır. Bu proje, dokunurluluk özelliğini kullanmadan, cihazın kullanım şeklini taklit ederek jog-shuttle'ı bir zombi medya cihazına dönüştürür. Geri çağırma süreci, cihazı kullanılmaz ve modası geçmiş olmaktan kurtararak yeni bir çalışma modu sunup, çağdaş medyaya katkıda bulunmaktadır. Yeni jog-shuttle'ın

dokunma duyusu olmadan yapılan jestlerle kullanımı, medyanın doğrusal olmayışını gösteren medya arkeolojik bakış açısı ile kurulmuştur. Bu bilgi aktarımı, analog cihazın bedensel olarak işleyişini tekrar ele alır ve yeni bir kullanım şekli oluşturarak etkileşim sırasındaki karar alma sürecini etkiler.

Keywords: Etkileşimli Tasarım, Hareket Sensörleri, Jest, Kullanım Şekli, Medya Arkeoloji

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TABLE OF CONTENTS

ABSTRACT iii

ÖZET v

ACKNOWLEDGMENTS vii

TABLE OF CONTENTS x

LIST OF FIGURES xii

CHAPTER 1. INTRODUCTION 1

CHAPTER 2. MEDIA ARCHAEOLOGY AND ANALOG CONTROL DEVICES...5

2.1 Media Archaeology Lab.....5

2.2 Media Archaeology: Recalling the Dead Media Device 9

2.3 Analog Control Devices and The Jog-Shuttle.....18

CHAPTER 3. MODE OF OPERATIONS AND GESTURES 29

3.1 Mode of Operation.....29

3.2 The Jog-Shuttle's Mode of Operation.....30

3.3 The Gesture and Gestural Control 35

3.4 Interactive Works and Mode of Operation.....41

CHAPTER 4. THE PROJECT: MUYBRIDGE-500 AS THE TRANSFER ANALOG TO DIGITAL.....46

4.1 First Attempt and The Process of Translation Analog to Digital.....46

4.2 The Project: *Muybridge-500*.....51

4.3 Edweard Muybridge and the Movement Test.....59

4.4 Implementation of the Project.....64

4.5 The Motion Sensor and Gestural Control.....71

4.6 The Jog-Shuttle and *Muybridge-500* the New Mode Of Operation 76

CHAPTER 5. CONCLUSION.....83

REFERENCES 92

LIST OF FIGURES

1. Bilkent Media Archaeology Lab on December 2017 10

2. *Room 20* Video Installation 11

3. Bilkent Media Archaeology Lab and Its Instruments 13

4. The first Videotape Editing Machine by Ampex and Inventors of It 21

5. *Sony PVE-500* 22

6. Functions and Operations of *Sony PVE-500* 23

7. Rear Panel of Sony PVE-500 25

8. *Sony PVE-500'*s Jog-shuttle's Functions 26

9. Jeffrey Shaw, *Legible City* 43

10. Paul Sermon, *Telematic Dreaming* 43

11. Bernd Lintermann, *You:R:Code*, Documentation 44

12. The Connection Diagram of *Sony PVE-500* to a Computer 47

13. 9Pin RS-422 Sheme of *Sony PVE-500* 49

14. *Muybridge-500*, by Boran Aksoy, 2018 52

15. *Muybridge-500's* Instructions Diagram 53

16. *Muybridge-500*, Stop Video Operation 54

17. From Muybridge's *Animals In Motion*, as the First Video of *Muybridge-500* 54

18. Figure Skater Video of *Muybridge-500* 55

19. *Muybridge-500's* Projection Screen 56

20. Muybridge's Horse Shooting Setup 62

21. Gesture Implementations of *Muybirdge-500 in MAX/MSP* File 66

22. Circle Gesture Command in *Muybridge-500 MAX/MSP* Project File 68

23. Switch Video, Start & Stop and Reset Play Rate Commands 69

24. The Video Part in *Muybirdge-500 MAX/MSP* Project File 70

25. The Data Display Part in *Muybirdge-500 MAX/MSP* Project File 71

26. *Leap Motion* Infrared and Camera Technology 75

27. *Leap Motion Diagnostic Visualizer* 76

28. *Muybridge-500* in Bilkent University FADA Exhibition Hall 78

29. *Muybridge-500* with *Leap Motion Diagnostic Visualizer* 80

CHAPTER 1

INTRODUCTION

My academic engagement with Media Archaeology first formed with the conference "Play/Pause, FF/Rewind" which took place at Bilkent University in September 2017. The conference was a five-day event about "Shared Practices & Archeologies of Media" (Play/Pause, FF/Rewind Workshop & Symposium, n.d.). As an MFA student, building the *Bilkent Archaeology Lab* introduced me to the Media Archaeology field. My theory related to this field developed with the conference, where Jussi Parikka, Wolfgang Ernst, and Annie van den Oever were the keynote speakers. On the third day of the conference, Jussi Parikka (2017) had a presentation and Q&A session named *What's Media Lab Good For?* that inspired me. In his keynote, he mentioned the usage area of *Media Labs and Media Archaeology Labs* in academic and applied fields. The sentence that Parikka used became the main departure for this thesis, which was: "Media Archaeology Labs are for creating, producing, dreaming and imagining". For Media Archaeology Lab workers or laboratorians, dreaming and producing notions are effective to expand their vision and this perspective can

enlarge their production field. Before Parikka's speech, *Bilkent Media Archaeology Lab* was used as a transfer area where the old media materials as video cassettes were digitized. As a laboratorian in this lab, I tried to find a way to transform the Lab into a productive area where transference was not only the option.

The process of rethinking Media Archaeology Lab as a productive area creates the opportunity to look at the Lab with a different line of vision. Rather than the video cassettes or the film strips, devices which don't belong to contemporary media technologies are the distinctive elements of the lab. *Sony-PVE 500* (Sony PVE-500, n.d.) is one of these devices which works as an *Edit Control Unit* controlling and interconnecting *Betacam Players* and *Recorders* to create unique video editing. This *Edit Control Unit* is one of the devices can't work independently. Because of its a remote control, without plugging to the *Betacam Players*, it is useless. Every device except the *Edit Control Unit* was working properly and serving their purposes. It would be exhibited at a media archaeology museum or it would be thrown away to be recycled if it wouldn't be used for any other purposes. Regaining this *Edit Control Unit* and its special knowledge are the main objectives of this thesis with a project.

At the beginning of the research process, the first question was "How Bilkent Media Archaeology Lab can be used for creation and production in addition to transference?". The productive and creative perspectives led me to choose the *Edit Control Unit* and revealed a new question. The core question of this study became "How can jog-shuttle be implemented in a digital work as a new mode of operation?". The purpose of answering this question is to recall the *Jog-Shuttle*

device by applying a new mode of operation to the digital world. The thesis project *Muybridge-500* is an interactive installation project aiming to test a new mode of operation and offer a different experience its users for the *jog-shuttle* by mimicking the original device which belongs to Sony *PVE-500*.

The technology and production change continuously. It is impossible to keep up with the conversion and development of the technology in these days. Within this change, every day some machines, devices and technologies lose their meanings or intended purposes by the introduction of new devices. Further, with the disappearance of old devices and machines, their mode of operations become meaningless. However, some devices are developing according to their purposes, shapes or mode of operations, some of them become completely obsolete. This applies to media technologies as well. The *jog-shuttle* technology or the devices which use the *jog-shuttle* had been used since the emergence of the radio knobs and the music technologies as CD Players until the arrival of the mobile phones. The main usage area accepted is as a piece of professional video equipment. Nowadays, it is still being used in different disposal modes, with the mimesis of the original purpose and mode of operation. *Muybridge-500* tries to find a new, alternative and digital mode of operation for the *jog-shuttle* which is inspired by *Sony PVE-500* in practice. This project uses *Leap Motion* which is a motion sensor capturing hand gestures to mimic and create a new mode of operation of jog-shuttle with the help of *MAX/MSP* software on the computer to control Eadweard Muybridge's (1985) *Animals In Motion* which is projected on a wall and additional videos created by me inspired by him and his projects.

The thesis is formed of 5 main parts. The second chapter focuses on the development of videotape editing and its technologies, Media Archaeology from the perspective of Erkki Huhtamo, Jussi Parikka, and Wolfgang Ernst. The third chapter mainly discusses the concept of "mode of operation" of jog-shuttle. In addition to that, to understand the interaction and gestural control, *gesture theory* which is debated by Giorgio Agamben and Vilém Flusser. The fourth chapter focuses on the project *Muybridge-500* aiming to explain the digitalizing process of *Sony PVE-500*, mimicking the *jog-shuttle* with a motion sensor and the content of the project as Muybridge's *Animals in Motion*. Lastly, the final chapter summarizes the process, outputs of the project and it explains the further research ideas.

CHAPTER 2

MEDIA ARCHAEOLOGY AND ANALOG CONTROL DEVICES

2.1 Media Archaeology Labs

> "Nothing extraordinary and nothing 'scientific' was happening inside the sacred walls of these temples." (Knorr, 1981, as cited in L'atour, 1983:141)

Science or physical science labs are regarded as the sacred rooms or buildings. It is because of the aura of the spatial areas resulting form the necessities to realize the experiments and the spatial specific instruments. For example, a biochemistry lab contains specific instruments such as centrifuge, chromatography, electrophoresis, colorimeter and further. The environment is hygienic and covered with white color. All this setup is designed for the usage of a scientist who are in search for the discovery of scientific truths and epistemic results. Jussi Parikka on his talk at *Play, Pause/ FF, Rewind* mentioned the perspective of science labs as follows:

> Speaking of science labs, especially the chemistry lab of Louis Pasteur, the theorist of science and technology Bruno Latour announced “Give me a lab and I will raise a world,” to emphasize how powerful places of transaction, production, transformation and persuasion labs were since at least late 19th century. Labs are where small things, like an observation of bacteria, turns into societal changes in healthcare as the lab itself performs a role as neutral to social concerns, yet becomes their infrastructure. (Parikka, 2017:2)

The explanation of Jussi Parikka on the impact of labs creates the strict and powerful point of view of labs. Further, the persuasive power of lab creates the magic and the extraordinary aura of the lab.

As L’atour mentioned Knorr’s statement, the configuration of a lab appears as the sacred walls of a temple. Since, this magical outlook of science labs formed with the conspectus through physical science, it is also created by the architecture and the instruments which are placed in the science labs. In general, the majority of society haven’t seen a science lab in their lifetimes. Others who have seen a laboratory from the outside, the lab offers its magic. If as L’atour mentioned the labs are not producing science or extraordinary things, why are they regarded as the magical areas? To wipe out this magic or the extraordinary look of a lab, the specific knowledge or a common memory should be integrated into the majority of the society. Science labs don’t address a cultural or a collective memory of a society or a group. Media Archaeology Labs are closer to L’atour’s mentions, they don’t have as much scientific appearance or a magical area as much as physical science labs have. They have their own aura and that aura doesn’t create any kind of fourth wall for the people. The reason for that genuine relation occurs with the contrary features of science labs as instruments or the aura of Media Archaeology Lab doesn’t differ from

the knowledge of the majority of the society. In general, a media archaeology lab doesn't alienate people, especially the instruments which belong to the lab create a collective or a cultural memory. To exemplify, media technologies as televisions, computers, video technologies, radio technologies, cables, patches, filmstrips, videocassettes, racks, towers, and further are the major instruments of Media Archaeology Lab addressing the collective memories. Most of the people should have encountered with at least one of these instruments during their lifetimes. Even if they hadn't met with one of them, Media Archaeology Lab contains the ancestor of contemporary media technologies. This kind of explanation manifests Media Archaeology Lab as an analog device museum. At some point, it appears as a kind of museum, but the inside of these labs' walls, there is more to it than being just a showcase. In addition, Bruno L'atour and Steve Woolgar (1986) mentioned, it is convenient to look at the Media Archaeology Labs as being an outsider to a lab as they did.

> When an outside observer first expresses interest in the activities of working scientists, he can expect one of a variety of different reactions. If he is a fellow professional scientist working in a different field, or if he is a student working towards final admission into the scientific profession, the outsider will usually find that his interest is easily accommodated. (L'atour&Woolgar, 1986)

Jussi Parikka, Lori Emerson and Darren Wrestler mentioned in their resource called *What is a Media Lab? Situated Practices in Media Studies,* the venues of labs in relation to the Media Labs as: "liminal but increasingly powerful spaces in many contemporary settings. They appear in universities and colleges, wedged uneasily between traditional departments and faculties. They're also in basements, warehouses, strip malls and squats." (Parikka&Emerson&Wrestler) The locations of

Media Archaeology Labs are not quite different from that of Media Labs. However, they are more close to being in the basement or at a warehouse because of the transformation process of the instruments, since Media Archaeology Labs are converted from storages of obsolete devices to the collection and rearrangement of wasted, maybe broken, zombie media devices. Further, even if they are converted from storages, Media Archaeology Labs also appear in universities as Jussi Parikka has also mentioned. These replacements express the educational part of Media Archaeology Labs. If we declare that the Media Archaeology Lab is an experiment area, these experiments also produce new areas for the researchers which lead to adding educative attitude to their purposes.

Lori Emerson who is the founder of the *Media Archaeology Lab* explains lab and its purpose on her website as:

> "Most of my research is currently focused on directing and developing the Media Archaeology Lab (MAL), which I founded in 2009. The motto of the MAL is "past solutions to present problems." Nearly all digital media labs are conceived of as a place for experimental research using the most up-to-date, cutting-edge tools available; however, the MAL is a place for cross-disciplinary experimental research and teaching using obsolete tools, hardware, software and platforms, from the past. The MAL is propelled equally by the need to both preserve and maintain access to historically important media of all kinds – from magic lanterns, projectors, typewriters to personal computers from the 1970s through the 1990s – as well as early works of digital literature/art which were created on the outdated hardware/ software housed in the lab." (Emerson, 2017)

Lori Emerson's description creates a framework for the concept of *media archaeology lab*. Even if she mentions specific features of her lab, the whole point of view is quite descriptive to understand the *Media Archaeology Lab*. For example, obsolete tools that she mentioned is one of the main instruments of *media*

archaeology lab. As it's mentioned that lab is not only a showcase, Lori Emerson explains other ways using of Media Archaeology Lab. The lab is an experimental area which aims to research, experience, conduct artistic production by digging materials' mode of operation, materiality, historical and cultural background, circuits, etc.. The reason for dealing with this kind of excavation process from dusty storages isn't only for experimenting or experiencing the past. Media Archaeology Labs are for as Lori Emerson (2017) mentioned "past solutions for present problems." This motto explains media archeological approach in some ways, but the concept of lab needs more than this statement. In addition to Lori Emerson's view, it is not for only present problems, it is also for futuristic attitude, artistic production and to gain experience for teaching as it is mentioned. To create a whole framework on "What is Media Archaeology Lab?" Jussi Parikka's statement would be clear enough to understand: "In other words, the space it uses is about a re-contextualization so that the design methods like prototyping become a way to investigate materials, production, use and other habits of media as related to our embodied sense of culture." (Parikka, 2017:9)

2.2 Media Archaeology: Recalling the Dead Media Device

Bilkent Media Archaeology Lab is a lab which is established as the extension of the Communication and Design Department that is located in İhsan Doğramacı Bilkent University in Bilkent, Ankara (Figure 1). The lab is idealized by the coordinator of MFA in Media & Design Program Assist. Prof. Andreas Treske and established and realized by him, Master of Fine Arts in Media and Design candidate Melih Aydınat and me. The Lab is placed in the basement of the Faculty of Art, Design, and

Architecture Building took 4 months to transform into a functioning lab. Andreas Treske (2018) identifies Bilkent Media Archaeology Lab in his interview with Jussi Parikka as:

> The lab is one of the newest extensions of the Department of Communication and Design's studios and production facilities called BITS (Bilkent İletişim ve Tasarım Stüduyosu or in English: Bilkent Communication and Design Studio). "BITS" was setup in 1999. Today the studio facilitates two sound stages, a Foley studio (which is under construction), a stop-motion studio, post-production facilities and a multi-camera production setup at the Bilkent Symphony Orchestra Hall.



Figure 1. Bilkent Media Archaeology Lab on December 2017

Bilkent Media Archaeology Lab comprises of multi rooms which are extended with different kind of studios as sound and multi-camera production to raise the variation and the quality of the production. During the realization of the lab while the first aim

was to create an area to experiment and share knowledge on developing for aging media tools. In addition, before the idea of building *media archaeology lab*, as two of the MFA students, me and my colleague Melih Aydınat with coordination of our advisor Assist. Prof. Andreas Treske, we produced a multi-media project on a theatre play which is called *The Madman and The Nun* directed by Daniel Irizarry (https://www.youtube.com/watch?v=o1gfdfQtEFc). The play was shot with 5 *MiniDV* Cameras with live mixing with *the analog video mixer.* It's output was projected to outside of the stage. The final step of the project was a video installation which was called *Room 20* (Figure 2). The main motivation to work with analog equipment was to make a reference to the content of the play and its origin's time period. In fact, the multi-media *The Madman and The Nun Project* as *Room 20* was the first inspirational motive to build this kind of lab.



Figure 2. *Room 20* Video Installation

The first move to create the lab was collecting obsolete media devices as videotape recorders, players, old computers, sound recorders, editing machines, archival materials and other types of audio-visual materials into the room from all over the university (Figure 3). Further, faculty members are still donating their individual materials or archives to the lab. In other words, the place became a rescuing space of media materials at the beginning as Assist Prof. Andreas Treske (Treske, 2018) mentioned in his interview. After building a running lab with obsolete tools, the process of collecting won't stop but it will decelerate and it will give way to using and testing the devices, examining the archive materials and transferring of the video cassettes of Bilkent Communication and Design Department *PASO Student Film Festival Archive*, the *Bilkent Turkish Cinema Archive by* Assist. Prof. Dr. Ahmet Gürata, the *Bilkent University Institutional History Archive,* & more of them to the digital medium to make them accessible. To organize such facilities of the lab, undergraduate and graduate students voluntarily became labaratorian or laboratory workers.

Transferring and testing process of the instruments of the lab and other types of materials were the main usage areas of the lab. However, Bilkent Media Archaeology Lab should turn into another type of space which would allow to make experiments, practicing the materials in different ways like circuit bending, etc… Assist. Prof. Andreas Treske (2018) mentioned the contemporary and the last usage area of the lab as:

> We have a shared environment with shared practices related to a diverse range of media technologies from analogue to digital. Shared practices lead to experiments, and a diverse range of learning methods through practices of

box opening, functional tests and identifications, encoding and decoding, transferring and so on. The interesting part is that the environment is combined with a theory and practice project-based approach.



Figure 3. Bilkent Media Archaeology Lab and It's Instruments

The focusing area of the lab clarifies the Media Archaeology Lab's and Media Archaeology field's working principles or mode of operation with this explanation. As Bilkent Media Archaeology Lab labaratorians, we started to acquire new point of views through the relation between analog and digital, as a way of using unique devices that we had never had an experience of and a way of testing. Melih Aydınat, Assist. Prof. Andreas Treske and me started to experience and play with the obsolete devices and instruments which belong to Bilkent Media Archaeology Lab. During the *Play/Pause, FF/Rewind* conference, the members and the participants had a walk

through at the Bilkent Media Archaeology Lab. The instruments of our lab have been demonstrated and experienced in that walk. The most exciting tool for me was the *Edit Control Unit: Sony PVE-500* which had been used as a *Betacam* type videotape editing tool. That instrument is also one of the favorite instruments for the members of the laboratory due to its interface which is neat, tidy and symmetric, intended purpose and mode of operation. Further, I had personal memories with the device which belongs to my childhood. The whole process of the observation on the form of the *Edit Control Unit: Sony PVE-500,* inspired me to ask a question about it which leads to create this research. The research helps to preserve the jog-shuttle from being trashed as a material itself or supports its knowledge transfer from analog to the digital.

Media Archaeology declares that a part of it acts as a research method or an experimentation process of the archival materials or the obsolete tools. Jussi Parikka, Darren Wershler, and Lori Emerson had an interview which is called "Jesper Olsson on The Media Archaeology Lab with Jesper Olsson" (2016) who is a researcher working on media technologies through history, explains the method of media archaeology on obsolete technologies as:

> to expand the idea of "historical reenactment" (Collingwood) from a mere thought experiment to a concrete operation with actual objects, in order to sharpen our understanding of what media are and how they operate, of their specific temporality, of their impact on perception and thinking, on cultural practice and art and everyday life, etc. (Olsson, 2016)

Olsson's historical reenactment notion from Collingwood is a kind of supplementary idea of what this paper's research is about and the experimentation through the object. It doesn't approach a rescue operation to preserve without harming the

original. It is the experiment process where you are allowed to make mistakes and have more freedom on experiencing the materials. The materials or the instruments that can be experimented with are introduced in different ways. Bruce Sterling (1995) enframes those devices as *Dead Media* which are slow, useless, antique & lost their pretended purposes. In fact, the presence of new media creates a binary opposition to this topic and results in the notion of *old media.* However, the most efficient way of naming these instruments and emphasizing the recalling phase is determined by Jussi Parikka (2012:3) in his book called *What is Media Archaeology?*:

> In the midst of talk of 'dead media' by such writers as Bruce Sterling, it was clear that a lot of dead media were actually zombie-media: living deads, that found an afterlife in new contexts, new hands, new screens and machines.

Even *dead media* is a way of expressing the obsolete material, it seems problematic in terms of linguistic. If we declare something as dead, we assign a meaning to it like being useless and rejected. It is also true for the term old. Due to this, Parikka's terminology is the most convenient way to express the field. In addition, Parikka's use of the terminology as *zombie media* contains more than emphasizing the origin of the material. It embraces the experimental operation on the instruments or other types of materials and their future. If we declare that *zombie media* is the reanimation of the obsolete media, its resurrection is one part of the terminology also. In other words, *zombie media* involves re-animation of the obsolete which creates a new experience which comes from the past. This is a complete *recalling process* from past creating a timeless life for a media instrument. There are lots of ways to examine the obsolete tools recalling towards the contemporary media, art or everyday life. Wolfgang Ernst draws the baseline of *zombie media* and the *Recalling Gesture of*

Media Archaeology on his speech at *Play/Pause, FF/Rewind* as: “Only occasionally it is about digging out obsolete media from the past remember alternatives to existing technologies. Media Archaeology defends the 'antiquarian' approach to machines and automata indeed” (Ernst, 2017:2). Ernst has the closest approach explaining the process of testing and experiencing that is already mentioned. Recalling gesture which is mentioned as “digging out obsolete media from the past remember alternatives to existing technologies” is the main working method of this research and the project.

In a theoretical way, the descriptions that are mentioned above create a way of understanding the Media Archaeology and one of its methodologies. Although in practice, the way of doing named as the “Media Archaeology Art” or the “Media Archaeology” as an art method. In this case, there are several artists who use Ernst’s explanation as the methodology of creating their artwork. One of them is Paul DeMarinis who is a performance and installation artist and he has been declared as a media archaeology artist. One of his early works, *The Edison Effect* (DeMarinis, n.d.) is an artwork that he brings together the past technologies with the contemporary technologies. *The Edison Effect* is a sound installation which uses vinyl and wax cylinders as the sound recordings. It tests these surfaces like vinyl with a laser as a reader which comes from the CD technology to create a kind of soundscape. Paul DeMarinis by referencing Edison, created a dialogue between the old phonograph that is invented by Thomas Alva Edison with the contemporary technology of that area, a working system, the laser beam. What Paul DeMarinis did is a way of reproducing the meaning with the oppositions between new and old. Jussi Parikka

regards (2012:139) the artworks like Paul DeMarinis's as a way of understanding the progress of investigating the devices which were dead and the observation of the change between the new and the obsolete. The methodology as of this kind of artworks forms a new context and leads to new inventive approaches for the obsolete in the age of "novelty-obsessed technological culture." (Parikka, 2012:139). *The Refunct Media* is another type of artwork which uses Media Archaeology as its methodology or point of departure, created by Karl Klomp and Gijs Gieskes (Klomp and Gieskes, 2010). The piece contains several obsolete media technologies especially video technologies in relation to each other. The work itself can be regarded as a working closed circuit with idle devices in the context of interaction with each other. Jussi Parikka mentioned *The Refunct Media* as it takes inspirations from the Media Archaeology field. The last example for the Media Archaeology Art or the Media Archaeology as a methodology is Toshio Iwai's *Electroplankton.* It has different features in comparison to DeMarinis's or Gieskes and Klomp's work. *Electroplankton* is a music video game produced for Nintendo DS. Errki Huhtamo and Jussi Parikka mentioned Iwai's work in the introduction of Media Archaeology as:

> have also used media archaeology as an inspiration for astonishing high-tech creations, such as Iwai's Electroplankton … These works do not necessarily even reveal their media archaeological inspiration at first look, yet they create a cyclical motion in a way many media archaeologists no doubt endorse. (Huhtamo & Parikka, 2011:15)

These three specific works which are integrated to Media Archaeology field is like a small compilation. There are different artists and artworks related to this field and the methodology such as: Jeffrey Shaw, Ken Feingold, Lynn Hershman, Perry Hoberman, Michael Naimark, Catherine Richards and Jill Scott as they were

mentioned in Erkki Huhtamo's (1995) article: *Resurrecting the Technological Past: An Introduction to the Archaeology of Media Art.*

Muybridge-500 is one of the projects that seek to be a candidate among these artworks. The main point of that work is an obsolete device *The Edit Control Unit*, and the working principle of it. *Muybridge-500* questions the mode of operation and the experience of the *edit control unit* in contemporary technologies through motion sensors inspired and based on the obsolete version of Jog-Shuttle from *Sony PVE 500*. As Ernst's approach to media archaeology, *Muybridge-500* is a way of experimenting with the contemporary digital technologies by digging out obsolete media from the past. However, the application is different than Ernst's whole idea, the haptic re-experiencing don't match with the project. *Muybridge-500* also endeavors the experience of air-touching and anti-tactile mode of operation for the *jog-shuttle*. The experiment and the experience of the air *jog-shuttle* examine the constant change in technological field as the conversion of the user experience. In addition, *Muybridge-500* is recalling an obsolete device to everyday life inspired by *The Editinig Control Unit: Sony PVE-500* and its *jog-shuttle* technology.

2.3 Analog Control Devices and The Jog-Shuttle

Video or film editing is regarded as the blending or combining video materials that were shot to create a meaningful, persuasive final touches. In general, the clips or sequences have been shot or generated; are composed consecutively to create a new composite result. In other words, filmmaking and editing is a field that contains more than arranging clips. The order, the duration of clips and the method of combining

the shots are the main features of this matter. The approach of film editing or video editing is creating the meanings by juxtaposing to form a new, different and supporting narrative structures. The basics of editing was invented after the birth of multiple shot films. Before that, the earliest films were not longer than one minute and they were shot in single shot as *La Sortie de L'Usine Lumière* by Lumière Brothers in 1895. After years of one shot short movie period, Mélies started to produce short movies as long as 14 minutes by using multiple shots that are accepted as the first trials of the basic film editing. Thereafter, Edwin S. Porter started to produce more dynamic multiple shot movies which create a visual and meaningful continuity. Ken Dancyger mentioned Edwin S. Porter and his method in his book *The Technique of Film and Video Editing: History, Theory and Practice* as: "It was not the until the work of Edwin S. Porter that editing became more purposeful." (Dancyger, 2002: 3) The act of Edwin S. Porter leads to the birth of film editing as the crucial factor of filmmaking and other type of film editing methodologies. After the first step by Edwin S. Porter, D. W. Griffith found the modern film editing. Griffith contributes to the field with the variation of shot size, shot types, different cutting techniques and it reveals the dramatic impact considering Edwin S. Porter. In other words, Griffith became the milestone of modern editing at the beginning of 1900's. The construction started by Edwin S. Porter and D. W. Griffith continued with Vsevolod I. Pudovkin, Sergei Eisenstein, Dziga Vertov, Alexandre Dovzhenko, Luis Bunuel, et all… who are mentioned extensively by Ken Dancyger as the pioneers of the montage or editing (2002). While the editing field was expanding in the context of narrative structure and compositions, the technology was intended to catch up with the development in this field. The field wanted to

realize its theory with experiments via enough practical skills and technological facilities.

Film editing is first started with analogue methods. It is the way of physically cutting and pasting the negative films and bringing together by using a glue. In the beginning of 1930s this analogue process implemented on motorized machines as *Moviola* and *Steenbeck* which made the editing restrained and easy. In addition, before these devices, sound couldn't be synchronized with the image as the part of the composition. Ken Dancyger explains the chronological development of film editing in his book in details (2002:41). In 1956, *Ampex* which is an American electronic company developed the first videotape machine (Figure 4). The machine uses a two inch wide tape called the *Quad.* They were the first devices and tapes which were used for professional broadcasting. Steven E. Browne mentioned the inventions of editing by Ampex devices as:

> At first, quad videotape machines were used primarily to record live programs for broadcast at a later time, but sooo people wanted to edit these programs by cutting something out or adding something in. ln late 1958, Ampex came out with a videotape splicer. By sprinkling a small amount of magnetically active tracing powder on the tape, the editor could see the video frame tine with the aid of a microscope. The original tape could then be cut at this line and new material spliced onto the tail of the original tape. (Browne, 1989:3)

After these kinds of inventions, in 1967, video and film industry met with timecode being the groundbreaking technology that led to today's editing facilities. Years later, the company called CMX invented *CMX-600* which is the first video editing system that works with computer disks. The revolution of devices contributed to the development of videotapes. Variety of companies enlarged the field with different

kinds of inventions for professional usage. *One-Inch Quad Tape, Two-Inch Quad Tape, Three-Quarter Inch U-Matic, Half-Inch VHS, Super VHS and Half-Inch Betacam, Betacam Sp* are the ones that are developed for the video editing domain (Browne, 1989: 24). These tapes and their players and recorders became industry standards. The active production and broadcast field demanded faster edits. To make the process faster, companies in this field, started to produce *editing control units, keyboards,* and *control track editors* which are operated by the editors. The keyboards used as editing control units has special mode of operation due to their communication with the computer. In addition, *CMX-600* is the editing unit controlled via keyboard also uses touch pen through monitors for edit points.

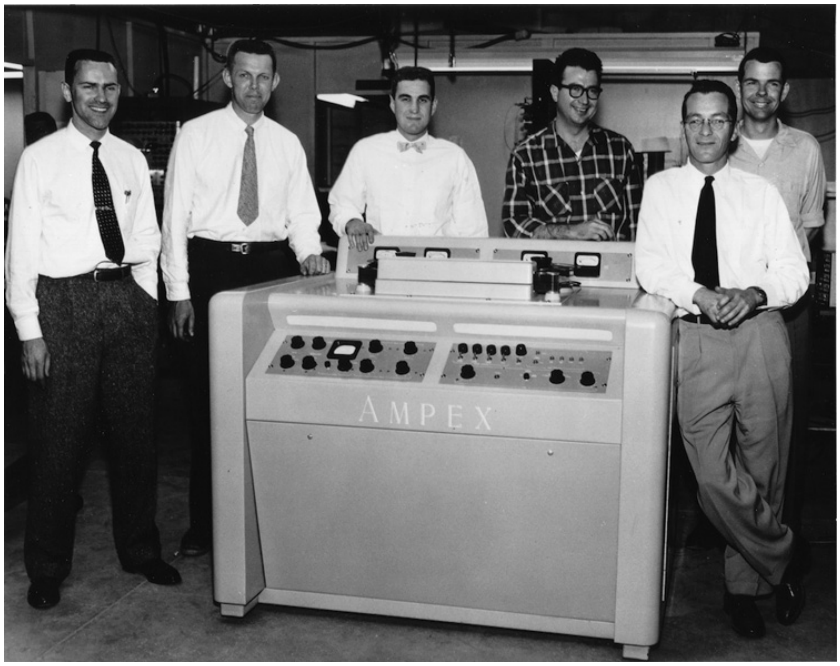


Figure 4. The First Videotape Editing Machine by Ampex and the Inventors of It

On the other hand, *editing control units* are the timecode readers which comes from players and recorders. Most of them use similar mode of operation like deciding IN/

OUT points and playback and record time functions. The device in basic, allows the editor to preview the video, electronically cut from tapes and record the content. The first *editing control Units* form out buttons, nodes, numeric keypads and joysticks. *The Convergence ECS Super-90* is an example of it. With improvement of technology, *editing control units* grew together with their functionality and interface. The common *editing control units* consist of buttons, led screens and the *Jog-Shuttle dial.* They were produced by videotape recorder or player producing companies as Sony, JVC, Panasonic. By these machines; separate controls for players and recorders and split edits which means separate audio track allowing editor to make *L Cuts,* separate preview of *IN* positions of player and recorder and transitions became widespread in the editing field.



Figure 5. *Sony PVE-500*

Sony PVE-500 is one of the editing control units which was produced in 1993 by Sony Corporation; Tokyo (Figure 5). The machine's intended purpose was controlling *VTR (Video tape recorder*) to get edited output from different *A/B rolls*, the device uses and controls multiple players and recorders at the same time. Especially, *Sony PVE-50*0 is the Control Unit for *Betacam Tapes* which first developed also by Sony in 1982 as a half-inch analog videocassette. In 1993, Sony developed the *Digital Betacam* format and the *Editing Control Unit* was used for *Digital Betacam* and *Betacam SP* players and recorders. According to its design, its interface was double-sided designed as a mirror effect which separates the recorders and the players. The center of the interface there is the main control commands of the device which allows the user to edit the videocassettes.

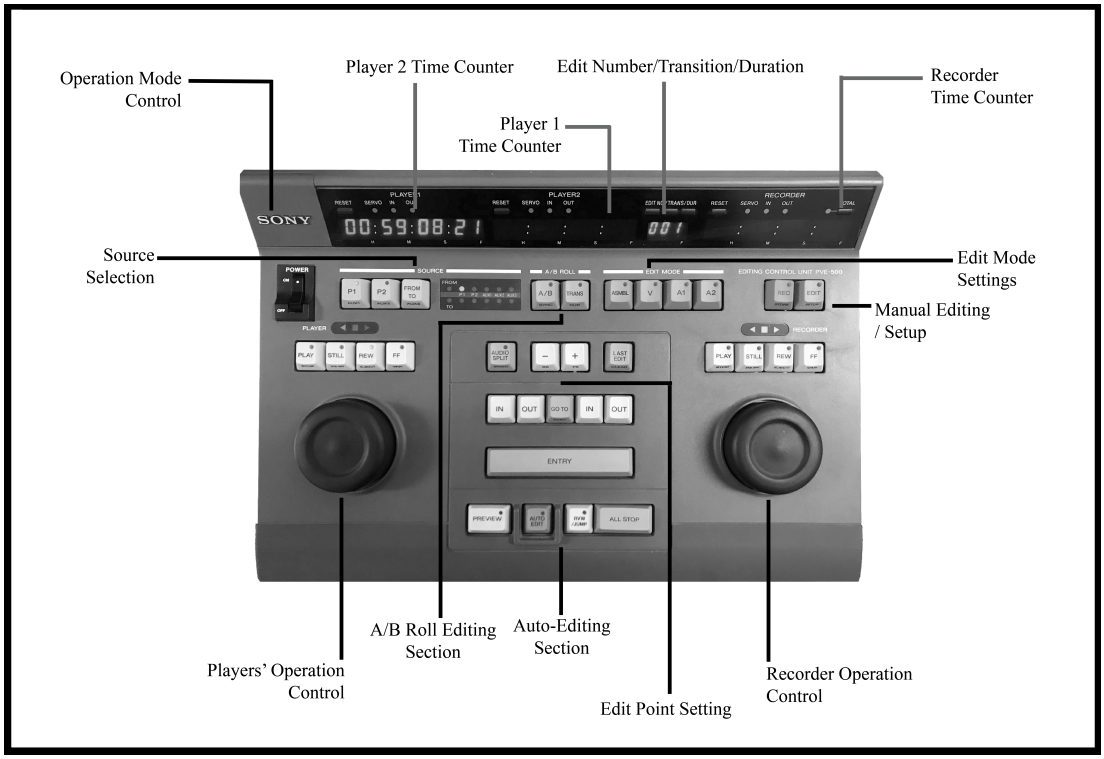


Figure 6. Functions and Operations of *Sony PVE-500*

The device has multiple functions to make the editing process easier and clearer (Figure 6). In the operation mode section of *Sony PVE-50*0, the editor can control the rolling time of the cassettes before that commanding play like 3,5,7 second as *preroll*. In addition, this section has a timecode variation option as *TC, RTC, CTL* which allows the professional to work with different time code options. The led screens shows the timecode of the two players and the recorder and work as time counters according to three different time code formats along with *IN/OUT* indicators . These screens and operation mode controlling the section of the device show and offer the communication method of the device. The source selection section creates the option of switching between two players which the user can operate at the same time. The edit number section screens the current edit number and the transition duration between the two cuts. *Sony PVE-500* offers a different kind of mode of editing as: *the assemble mode* or *the Insert mode* which can be switched from the edit mode section. The edit point settings are the features which ensure manual editing by deciding *IN/OUT* points with the help of plus and minus buttons setting up and trimming the videos frame by frame. The process continues with the manual editing section when the user decides to record the cuts to tape inserted to the recorder device. The last section of the *Sony PVE-500* the players and recorder operation control unit belongs to the biggest part of the interface. This section consists of play commands and the *Jog-Shuttle Dial.*



Figure 7. Rear Panel of *Sony PVE-500*

In the rear panel of the device, there are six different input and output which lead the device run, collect data and control different devices (Figure 7). This editing control unit doesn't process on image coming from players directly. *Sony PVE-500* communicates devices with timecode signals with its communication ports. Except the *AC IN* port, all the other ports that are screened in the Figure 7, are the communication ports with the other devices. These three ports which belong to player 1, player 2 and recorder are *9-pin serial* ports use *RS-422A* protocol to communicate via timecode data between players and recorder. The commands that the editor apply are transferred to the other devices by these ports and the *9-pin serial* cables. Switcher and Mixer plug-ins are for connecting external video and audio mixer to create alternative supplies. *EDL IN/OUT* which is an expansion of *editing decision list,* the input/output socket allows to plug an external computer to read or create an editing decision list up to 100 edits can manage the the cuts and edit automatically. For the most part, the working principle and method of *Sony PVE-500* commonly matches with other types of editing control units. Some of them uses *RS-232*, *BNC* out or in and further some of them can control only one player. The

distinctive feature of *Sony PVE-500* and its bottoms and ups are the two player controlling functions and the *jog-shuttle dial*.

Jog-shuttle is a bidirectional dial, wheel which is a part of *Sony PVE-500* as well as many other *editing control units*. It doesn't only belong to *editing control units,* it can be seen on the interface of *VHS, Betacam Players* as well. The dial which belongs to this device functions as a timecode counter which allows the editor move forward and backward on the timeline. It is a mechanical wheel working in three different modes (Figure 8).

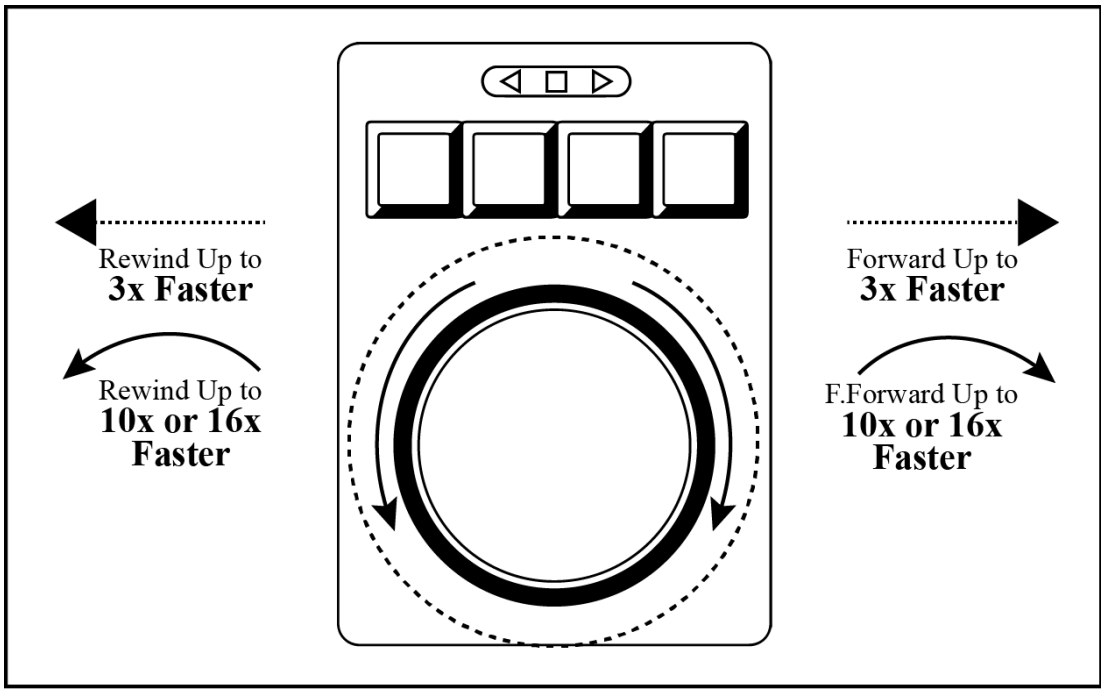


Figure 8. *Sony PVE-500's Jog-Shuttle*'s Functions

First mode is the jog function to forward and rewind up to 3 times than normal speed depending on the rotation direction. The editor can move frame by frame in the jog mode based on rotation being reverse or forward. The jog mode also shows a

watchable playback image on screen video while running the tape backward or forward as close to normal speed rate which can be perceived and followed by the editor. When the user stops rotating the wheel in these mode, a still picture displayed on the playback monitor. The main purpose of jog wheel is to make fine adjustments and traveling frame by frame to find an edit point in the video. The second mode of the dial is the shuttle. The shuttle is a faster mode of operation rather than the jog mode. It is functioning with the rotation of dial up to 120 degrees towards left or right. The right turn of the dial makes a fast forward from 10x up to 16x of the normal play rate depending on the angle. On the other hand, the left turn of the dial does fast rewinding between 10x up to 16x resting on the rotation angle. The center position of the shuttle dial gives a still picture that is also regarded as the pause image. The shuttle operation doesn't give a watchable feedback to the editor due to the speed rate of the function. The third feature of the dial is the push function. The push function allows the editor to switch between the two modes of the dial. The initial mode of *jog-Shuttle dial* of *Sony PVE-500* is the shuttle function. When the editor decides to make the fine adjustment, pushing gesture enables the jog function to forward or rewind frame by frame. However, the whole mechanical operation of this *jog-shuttle* belongs to *Sony PVE-500*, all the other *jog-shuttles'* usage method are close to each other. Even they follow approximately same process, the intended purpose of the *jog-shuttle dials* differentiate slightly. For example, if we accept that the ancestor of the *jog-shuttle* as the turntables for vinyls or the CD players for disc-jockeys and further as radio running knobs, the jog wheel is the speed controller or the time traveller in vinyl depends on how fast user reacts or creates rotation. There are many examples to demonstrate *jog-shuttle dial*, how it is mechanically working

or how they are used differently, but for the professional video technology field, the *Jog-shuttle* in simple, is time traveling controller to make faster playbacks in the videotapes.

CHAPTER 3

MODE OF OPERATIONS AND GESTURES

3.1 Mode of Operation

Mode of Operation is the term which is originated from the Latin term *modus operandi*. *Modus operandi* as a term which was used in the criminology field. John E. Douglas and Lauren K. Douglas explain the term *modus operandi* (*MO)* as: "Actions taken by an offender during the perpetration of a crime in order to perpetrate that crime form the MO. MO is a learned set of behaviors that the offender develops and sticks with it because it works" (Douglas&Douglas, 2006). In this statement, they explain the term *modus operandi* as a procedure, and a way. After this statement, they explained the perpetrator's doing while committing a crime. To extract the meaning of *modus operandi* from criminology, the meaning of it becomes more general. In the Cambridge Dictionary, *modus operandi* is stated as: "a particular way of doing something" (Retrieved from https: dictionary.cambridge.org/tr/sözlük/ingilizce/modus-operandi#translations). That is to say *modus operandi*

which is the origin and the synonym of the term *mode of operation* means that a "way of doing" in general without being in the terminology of any specific field.

If we take out the term from any specific field, it gains several features. The term includes and is affected by the other concepts as: methodology, technique, knowledge on doing something, uniqueness of a person who creates the operation, personal decisions, interaction while doing the operation, way of thinking, rules, habits of the operator and the operation itself.

3.2 The Jog-Shuttle's Mode of Operation

Sony PVE-500 as mentioned in "Chapter 2.3", is an editing control unit, which is a part of the first wave tape-based system. The working principle of this editing system and the whole operation is summarized in Thomas Ohanian's *Digital Nonlinear Editing* as: "Videotape editing is based on selectively recording material from a source videotape to a destination videotape called the master tape" (Ohanian, 1993). The actual usage area of the system and the devices are of professional broadcasting. The tape based systems are developed with the expanding field of broadcasting which is for accelerating the production time. In other words, the expanding broadcasting field leads to the birth of new machines to decrease the time spent on the post-production process and meet the deadline. This development led to the invention of different kind of devices as *Sony PVE-500* and other similar devices. Jog-shuttle wheel as a physical object, is one of the parts of these devices which corresponds to the speed of the broadcasting area.

Jog-shuttle dial is a type of controller wheel, which includes three separate functions. The first function is the jog, the second is the shuttle and between them is a pushing mode which stops the operation and the flowing image and it switches between the two other modes as it was mentioned in “Chapter 2.3”. It is a mechanical wheel which allows its user to operate by turning the wheel and the pushing on it. It was made from rubber and plastic, as technology advanced its material has also changed. The technical construction was first built analog with a circuit and it is replaced by digital ones.

Even the jog-shuttle is the name of the dial or the wheel, the actual name belongs to the operation itself. In other words, we can say that jog-shuttle as a dial is not the mode of operation itself, jog-shuttle as a mode of operation is related with how one moves along image flow and time-space blocks. It is completely related to moving from one point to another one on the timeline. Jog-shuttle as an operation in video broadcast systems or in videotape editing process, is the wheel which allows to move (slide) in the tapes forward and backward with the help of the timecode. The system which works with jog-shuttle has also playback and preview facilities. Jog-shuttle is a time traveller between the images which are the content of the videotapes. The actual reason to call the jog-shuttle “time traveller” is its mode of operation is directly related to timecode and temporality. Furthermore, it is a temporal travel operation which appears as the change of spatiality. Thomas A. Ohanian explains the time code on videotape as: “in the form of hours, minutes, seconds, and frames, such as 01:05:12:20, is a signal that is recorded onto videotape and that identifies each and every video frame” (Ohanian, 1993). It means that, every image which belongs to the

videotapes has a unique address by their time codes. Jog-shuttle operation as navigating, is the traveling between these unique addresses to preview, playback the videos and find the exact/precise points and informations.

The jog-shuttle as a physical wheel is operated by the turning gesture. According to it's physical feature and way of operating, the mode of operation should be non-linear. Furthermore, the systems called non-linear editing machines include jog-shuttle as a wheel. However, it's mode of operation is linear. In other words, by using a turning gesture, jog-shuttle as an operation allows the user to travel in the linearity of the time. Between the starting point of the videotape and the ending point, the editor or the user can travel between the images forward and backward. Jog is the slower and the shuttle is the faster operation due to their intended purposes, these two allow to choose the speed of the editor's or the user's navigation, based on her/his necessity.

The journey from a point to another point with a linear operation is originated from other devices. The radio turning knob is one of the examples which can be accepted as the origin of a jog-shuttle mode of operation. The radio knob or the wheel also worked with the turning gesture in a linear mode. The actual purpose of the radio knob is to find a specific radio station between different frequencies. It is a wheel which allows the user to find the station by catching the right and needed signal. The act of finding is the output of searching. In the usage of the radio, "searching" which is also called tuning, is in the radio broadcasting terminology. Jog-shuttle as a mode of operation works in the same rationale with radio tuning knob. In the manual of the

Sony PVE-500, the jog-shuttle as a physical wheel, is mentioned as the “search dial”. “While viewing the player or recorder playback on the monitor, use the search dials and the buttons in the player and recorder operation control sections to search for the desired scene.” (Corporation, 1993) The operating instructions which are explained and the terminology which is used by the manufacturer of the jog-shuttle as a device states the jog-shuttle as a search dial according to its mode of operation. Jog-shuttle’s mode of operation as a search dial, is explained as the act of searching to find the desired scene.

The mode of operation as jog-shuttle can be examined as searching and moving in between the frames to reach a desired or a selected scene. The desired scene that is mentioned in the operation manual of the device means that the image or the sequence that will take place in the final cut of a video or a movie. The editing as an act which is created by these desired scenes is constituted by the cuts between these scenes. To extend the desired scene and the cut, these terms are originated from cinema. Walter Murch who is one of the pioneers of editing field mentioned cut between desired scenes with the blink of the audience in cinema as:

> You should be right with the blinks, perhaps leading them ever so slightly. I certainly don't expect the audience to blink at every cut-the cut point should be a potential blink point. In a sense, by cutting, by this sudden displacement of the visual field, you are blinking for the audience: You achieve the immediate juxtaposition of two concepts for them-what they achieve in the real world by blinking (Murch, 2001)

The explanation of the cut in cinema by Walter Murch matches with the audience’s blink. Since the blink gesture is a momentarily act of the eye, the cuts are very sharp movements and because of blinking doesn’t create discontinuity of human vision, the

cuts between the desired scenes shouldn't create a discrete gap, it should follow the flow of visuality and meanings as Murch exemplified as: "Instead, from the moment we get up in the morning until we close our eyes at night, the visual reality we perceive is a continuous" (Murch, 2001). Jog-shuttle as a mode of operation helps to find the fine adjustment to cut between the desired scene with a slower or faster searching attitude which follows this kind of contextual and visual continuity. As a search operation, jog mode is a way of searching between the frames to find the accurate cut point as the blinking in editing. Even the cut which follows the continuity or discontinuity, jumps forward or backward in time and space, the decisive moment of cut is a way of trimming with a specified point which can be found within a short range of frames. Shuttle which is a faster search operation differs from the jog operation. The shuttle operation in cut or desired scenes is a way of "fast searching". The fast search in the movies on a videotape belongs to a part of finding different contexts or different sequences which are in between wide ranges in the temporal spaces of the videocassette. It is a fast traveler between different points. The main difference of this two modes is that, the shuttle is an operation which allows to travel long distances to find a point in high speed, whereas the jog is a slower and careful operation which helps to travel short distances with more precision.

Editing with the jog-shuttle operation is actualized as follows: fast traveling and searching with a shuttle operation to find the decided moment or the sequence in the videotape, stopping by pushing the wheel as an operation of marking which allows

the editor to choose the moment of the cut, and slow traveling and searching between the frames to find the decisive moment of cut.

The searching and traveling attitudes of the jog-shuttle as a mode of operation is a physical action. Because the system has a preview function while performing the jog-shuttle operation and jog-shuttle as a physical device which works with big gestures in comparison to the knobs, or buttons, it is a physical bodily action which consists of eye-hand coordination. Rather than the small hand gesture or the two finger knob turning gesture, jog-shuttle is a full hand gestures and active movements in coordination with the eye. The coordination can be explained as: the preview which belongs to the source tapes and the master tapes are operated by slow or fast travel in images, whereas the marking gesture (pushing) is actualized with full hand movements. In other words, jog-shuttle as a mode of operation which is realized via actively using hand gestures and decision making becomes a physical bodily action.

3.3 The Gesture and The Gestural Control

The gesture is the part of human body and mind intercommunication which allows to interact with outside world. There are different perspectives which identify the gesture notion. One of the main descriptions and explanations is: “The gesture is, in this sense, communication of a communicability. It has precisely nothing to say because what it shows is the being-in-language of human beings as pure mediality” (Agamben, 2000). The statement of Giorgio Agamben in *Notes on Gestures* explains the position of the gesture in communications field. Furthermore, gestures are the tools which conduct the process and carry lots of meanings in them.

Before the birth of verbal language, gestures were the only way of interaction and communication between people and also, the history of gesture makes it a powerful tool. Furthermore, Giorgio Agamben also explains that gesture is more powerful than the verbal language although both of them belong to linguistics. The absence or the deficiency in communication by words can be filled with gestures as Agamben (2000) mentioned:

> [I]t is always a gag in the proper meaning of the term, indicating first of all something that could be put in your mouth to hinder speech, as well as in the sense of the actor's improvisation meant to compensate a loss of memory or an inability to speak.

Since gestures carry more meanings than the sentences, they can be used instead of acts or statements which are formed by group of sentences.The position which was created by Agamben put the notion of the gesture on a higher level than the verbal communication to express onself. It is because of the reason that the gestures are communication tools working by themselves. Furthermore, the gesture plays its roles when the verbal language lacks the necessary means to communicate. Agamben's "the actor's improvisation to compensate a loss of memory" is an example of this situation that shows language's deficiency. In addition to these, in the statement of Agamben, he explained one of the kinds of gesture as the "gag". In the last sentence of *Notes on Gestur*e, he emphasizes the gesture of "gag" with the Wittgenstein's definition as: "what cannot be said is literally" (Agamben, 2000). These statements build all the layers of Giorgio Agamben's gesture theory on human communication.

Gesture as a communication tool is a way expression of the human mind. Rather than expressing by words, it is a bodily act which is created through a translation of the

human mind to the parts of the body. William Flusser has another definition to expand the term gesture as: “is as a movement of the body or of a tool attached with the body, for which there is no satisfactory causal explanation.” (Flusser, 2014). The definition of gesture by Flusser which has a priority of emphasizing the “movement of the body” is different than Agamben’s philosophical perspective. He directly relates the notion of gesture with human body as a part of self-expression. When the gesture is related to the human body, it becomes the action itself which is a representative of something in the human mind. Actually, when people can’t express themselves in a conversation, they substitute that lack with hand movements. These hand movements are the self-expressive movements of human body which is derived from the mind. In other words, hand movements are gestures that reflect human mind. If a person can’t figure out what or how they say something, they automatically use hand gestures, hence, he/she creates a new information without saying anything in a conversation. Sign language is the one of the significant examples of information created by gestures. By this significant example, the gestures become readable through the interactions between the encoder and the decoder. This coding is a process or a tool which creates a communication through bodily action.

More than bodily action, Flusser expands the notion of gesture with a different point of view. Rather than a means communication, he explains the gesture as a productive tool that shape our understanding the world. In the chapter named “Gesture of Making” in *Gestures*, Flusser explains the gesture done by two hands as:

> The words we use to describe this movement of our hands—take, grasp, get, hold, handle, bring forth, produce—have become abstract concepts, and we often forget that the meaning of these concepts was abstracted from the concrete movements of our hands. That lets us see to what extent our thinking is shaped by our hands, by way of the gesture of making, and by the pressure the two hands exert on objects to meet. (Flusser, 2014)

Flusser's definition of gesture on making, expands the notion of gesture as a bodily action from a different point of view. The abstract concepts he mentioned which shape our understanding of the world brings the notion of gesture together with the physical action. Furthermore, the pressure with the hand that is mentioned by him, is a way of explaining the shaping of the materials forms. This gesture which is done by hand becomes the tool of production which emerges from the mind. People use this gesture to create tools with hand movements. In other words, the gesture of making is changing the shape and the form of object by the hand movements and it leads to the birth of another subject with a different form. The alteration of the form with hands and the birth of new and another context is named the "gesture of producing" by Flusser (2014). In the contemporary world, we can mention the gesture of making and gesture producing in different manners. Still with the hand movements, we produce new forms without any physical pressure. As an example, we build huge constructions with the help of heavy construction equipments by using minimal hand gestures. On the other hand, we produces writings with keyboards as we produce movies with the editing units.

The general concept of Flusser by looking at his book, has two nested explanation. The first one is directly related to a human bodily action like the movement of the hands. The second one has more philosophical perspective, it explains his notion of

gesture as a “way of doing”, producing, knowledge on a particular subject and methodology. On the other hand, Agamben directly relates gesture with communications.

Gesture is a communicative and interactive tool for understanding, producing and forming the outside world. The interaction and production tool notions are related to human to human and human to form relationship. Furthermore, human being is used to use gesture while using tools since the ancient times. By the change of the tools and the development of technology, gestures are debated on the human-device interaction areas. Every device has a unique interface. These interfaces lea the emergence of new kinds of gestures. For example, knobs on devices demonstrated a different way of usage which create a unique output in comparison to the buttons. On the other hand, wheels which have specific usages, operate differently than the switches. Every specific part of the devices needs different gestures which are assigned intended purposes and they produce different outputs between each other. *Sony PVE-500* and its jog-shuttle is an example of physical interface which has special gestures in a tactile operation. The gesture used while operating the *PVE-500* is also the way of communicating with the device and it provides the interaction between the other devices.

In the contemporary world, human-device interaction is specified with human-computer interaction. The part of human-computer interaction is analyzed on the gesture both form the perspective of being a bodily action and a tool for intercommunication. At the beginning, it was a debated issue regarding the tactile

interfaces. The interaction between a mouse and a digital interface of a computer, can be an example of this tactile operation. In 1982, the tactile operation between human-computer is changed with the invention of the “wired glove” technology. This glove has changed the human-computer interaction and communication by minimizing the tactile gestures. It added to the human-computer interaction field new hand gestures. “The hand gesture input devices presented here, the Z-Glove TM and the DateGlove TM, are lightweight cotton gloves containing flex sensors which measure finger bending, positioning and orientation systems, and tactile feedback vibrators.” (Zimmerman, Lanier, Blanchard, Bryson, & Harvil, 1987). The gloves have live feedback on the computer screen which demonstrate the gestures which are done by the user. The aim of inventing this kind of glove is explained in the same article as: “for evaluating hand function, a three-dimensional hand model controller, an interface to a visual programming language, a music and sound synthesis controller, a finger spelling interpreter, and a computer-generated object manipulator.” (Zimmerman, et al.) These examples explain that he invention of this kind of technology has led to a new era on human-computer interaction. Touchless operations took their place in the gesture of computing. By this gloves, the production and the intended purpose of the computer commanding, the gesture of production changed and the gesture as a bodily action is implemented on human-computer interaction. With this kind of technological improvement, the gesture based human-computer interaction has changed. Inspired from the gloves, camera based gesture recognition systems became the contemporary devices in human-computer or human-machine interaction manners. *Xbox Kinect, Playstation Camera, Leap Motion* are the popular examples which create gesture based interactions with the devices.

Furthermore, the radar technology is adopted to human-computer interaction by a research group called *Project Soli* which was revealed at Google in 2015 (Project Soli, 2015) . It is at its development stage, but it might take place in the future.

3.4 Interactive Works and Mode of Operation

Mode of operation and the gesture are not exclusive to human-machine or human device interaction or communication only. These two terms are used in other type of fields as well. In the art field, the artworks which are not identified as "distant image", especially the interactive ones, have unique mode of operation and control which constitute a new form of communication and interaction between the participant and the work. That is to say, as every device has its own unique operation and procedures, every interactive artwork also unique by its own operations and procedures. The special mode of operation as the process of an interactive and not as a distant image artwork is mentioned by Mark Stephen Meadows, he states that the "[i]nteraction is a process of communication that dictates process. It provides options, necessitates a change in pace, and changes you as you change it … Interaction operates on something" (Meadows, 2003) The general explanation of the working principle of that kind of artwork can be explained better with some examples.

One of these artworks is the *Legible City* (Legible City, n.d.) which belongs to one of the pioneers of interactive art; Jeffrey Shaw (Figure 9). The work was first constructed in 1989 Nagoya, Japan. The *Legible City* is defined as: "a user to navigate a virtual projected city constructed of giant buildings in the shapes of letters

by bicycling on a stationary bicycle. One can follow narratives and other threads of text by riding down the streets of this strange city" (Wilson, 2002) The simple function of the artwork is "bicycling in the city which is covered with texts". On the other hand, Legible city is more than this. Rather than showing a video with a city map, or offering a navigation for its users with a mouse which controls a computer screen, *The Legible City* creates a unique experience by letting participant to hang around with a bodily action in a virtual city to create an experience close to a daily life activity. The other part of the work is the textual part. Jeffrey Shaw changes the buildings with the texts which constitutes meanings while the user navigates within the city. Reading as an action, is generally associated with sitting and relaxing. On the other hand, all the texts have an author attitude as the writer offers the reader a text with a specific order and lead the user to make meanings by following the author's planned route as a narrative structure. However, in this artwork, the user chooses the texts according to his/her navigational path and it leads to the construction of unique meanings which are based on the users' decisions.

In *Legible City*, Jeffrey Shaw changes the bodily and mind operation of the reading activity. That is to say, *The Legible City* has a unique mode of operation which allows its user to take a bodily action as bicycling where the texts are placed as the buildings of the city instead of sitting to read. It offers a new way of doing for the reading activity and exploring the city in a virtual interactive artwork.



Figure 9. Jeffrey Shaw, *Legible City*



Figure 10. Paul Sermon, *Telematic Dreaming*

Another example of these artworks, is *Telematic Dreaming* (Paul Sermon: Telematic Dreaming, n.d.) by Paul Sermon (Figure 10). The work is defined in the book

Information Arts as creating: “an environment of telematically linked beds or couches located in geographically dispersed areas. Participants are enabled to be together with each appearing in the other’s bed—another telepresent person seems to be next to the viewer via projection.” (Wilson, 2002) The basic function of this artwork can be explained as the tele-conference system which works in a different mode, hence, serves a different purpose. However, it is built with the technical facilities of the tele-conferencing system, it represents and offers a different experience. *Telematic Dreaming* changes the communication between the users which are far away from each other. By using the video technology and physically constructed rooms with beds, it offers its users a unique communication and new touching experience as a sense of touch which is impossible to imagine on long distances without a new mode of operation. The mode of operation of *Telematic Dreaming* can be identified as a new way of tele-communication and with the sense of pretending to touch by seeing a projected image of a real person on a bed.



Figure 11. Bernd Lintermann,*You:R:Code,* Documentation

The last example is a contemporary interactive installation project called *You:R:Code* (You:R:Code, n.d.) by Bernd Lintermann who is an artist and a scientist (Figure 11) . *You:R:Code* is constructed with surfaces which have the roles of mirroring the user with different elements to show its user that they are formed by codes. The surfaces are designed to visualize the user when they are in front of them similar to a reflection of a mirror, a 3d digital body reflection, a computer code, a flip-dot, a genetic code (You:R:Code, n.d.). This interactive installation aims to manifest that human beings have codes and they are constructed by them. Erkki Huhtamo relates the interactive art with touching (Hutamo, 2007). *You:R:Code* itself creates a concrete interaction with its users by live feedbacking the gestures and the movements of users from the mirror surfaces. The way of doing and the mode of operation of this artwork are more theoretical than Jeffrey Shaw's or Paul Sermon's works. *You:R:Code* is a way of claiming that human beings are consist of codes. Thew work is an unusual representation of reflections of people. It uses digital mirroring which not only reflects light but also other materials as well. The mode of operation of *You:R:Code* can be examined as a new way of manifestation that mirrors people with an eccentric attitude.

CHAPTER 4

THE PROJECT: MUYBIRDGE-500 AS THE TRANSFER ANALOG TO DIGITAL

4.1 First Attempt and The Process of Translation Analog to Digital

This chapter belongs to the period that is antecedent to actualizing the project. As it is mentioned in the introduction chapter, the aim of this paper is recalling an obsolete device which is the jog-shuttle, to create a new, alternate mode of operation. The first trial of flushing out the *Sony PVE-500* was to create an alternative purpose or a usage area for it. In other words, the first aim was to form a rescue operation which can be regarded as a physical rescue operation. The obsolete device *Sony PVE-500* can be saved physically from the process of a planned obsolescence or the circle of upgrade in the consumer culture. However, it is an old technology used and the technology itself developed much more handy and functional devices, this attractive and groundbreaker machine *Sony PVE-500* shouldn't fade away. This explanation creates the position as the rescuer or a lifesaver but the point of view is recycling without

destroying physically and approximate to unfold technology for obsolete devices especially the devices which are in media technology field.

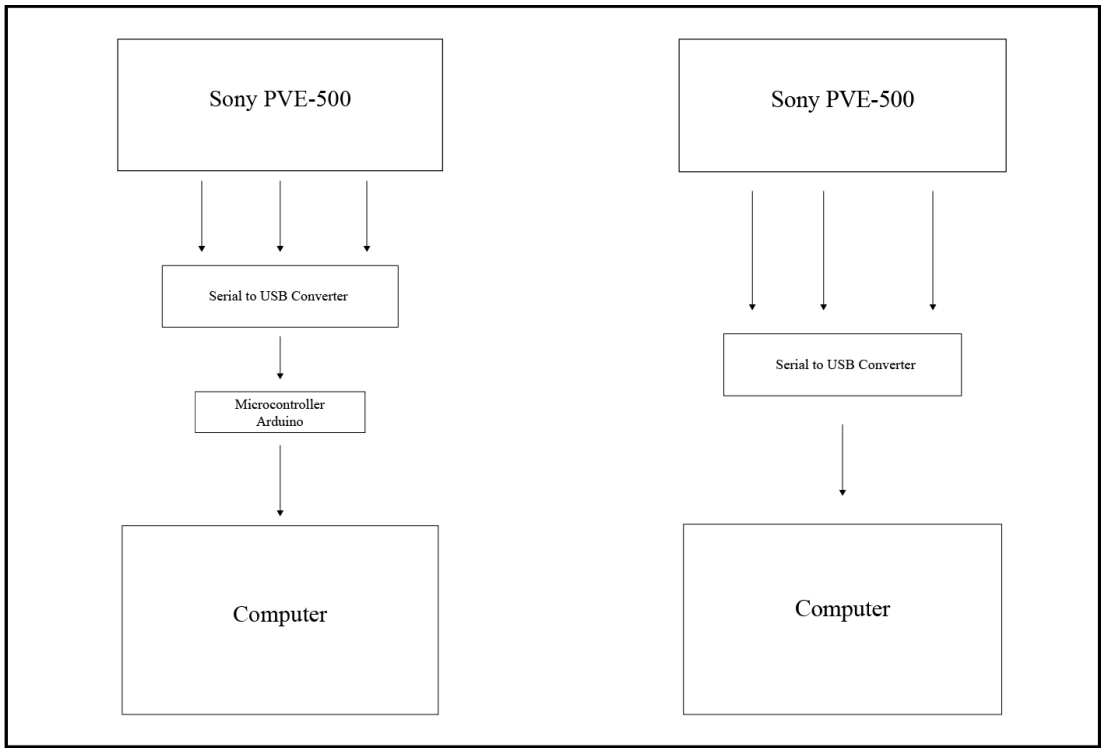


Figure 12. The Connection Diagram of *Sony PVE-500* to a Computer

The first step to actualize the project was to create a connection and a communication between *Sony PVE-500* and a computer. Computer could provide the opportunity of flexible usage for Sony *PVE-500*. In other words, the first act would be changing the intended purpose of the device via computer connection to regain the device to media technology field. With this method, rather than using as a *editing control Unit*, *Sony PVE-500* would become a physically running machine in contemporary technology which was adapted to another intended purpose. Due to my personal attitude and preferences and as the creator of the project, I put my priority on solving technical problems to reach the content as to find another purpose for the

device. In order to get or send the data between computer and the device, the device's communication protocol should be understood. Sony *PVE-500* provides its communication with players and recorders on *9-pin Serial RS-422* port (Figure 7). Especially *Sony* uses approximately the same protocol *RS-422A* as *RS-422.* To figure out how the device can communicate with the computer, there were two options (Figure 12).

One of them is plugging *Sony PVE-500* directly to the computer via *RS-422* to USB converter. Another one is adding a micro-controller like the *Arduino* to the circuit to collect data which can be transferred into the computer. *ATEN UC4852 2-port RS-422 to USB Converter* is the middle device of the circuit which allows us to make readable the data that comes from Sony *PVE-500 via 9-pin serial RS-422* communication port. The converter has a plug and play support which makes collecting data easier. After plugging all the devices to each other, we expected to see any kind of data flow coming from the movement of jog-shuttle or the other buttons. Although, everything was working accurately, the converter didn't get any signals from Sony *PVE-500*. With Kerem Enhoş (Graduate Student of Electrical and Electronics Engineering Department at Bilkent University), we reformulated the circuit and the process. Also, the connections in the port of *RS-422* should be solved to understand the problem of communication between converter and the device. *RS-422* port seemed to be the main source of the problem. We tried the rebuild our own cables with examining the *RS-422* pin schemes by using *Arduino* (Figure 13). We couldn't get the data from the

system and the new connection. The last thing that we checked is to see whether we can see any kind of data flow from *ATEN UC4852 2-port RS-422 to USB Converter* on the computer or not. The converter sent the data to computer but the data was useless. We could saw the data on a software which is called *Matlab.* The program showed a data set coming via *USB Converter* from computer. However, it was the first time that the device tried to connect with the computer, the data set was unpractical to be controlled.

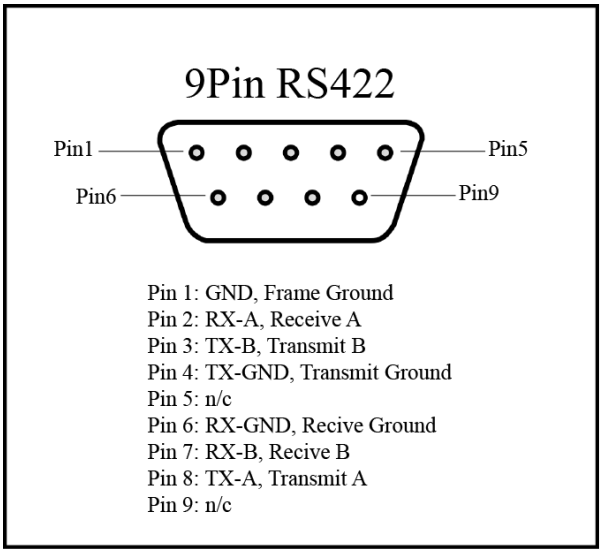


Figure 13. 9Pin RS-422 Scheme of *Sony PVE-500*

The whole process to connect the device to the computer took approximately three months. The main aim of connecting the device was changing the intended purpose of the machine. In other words, if it was possible to connect the device directly to the computer via any kind of converter or micro-controller, *Sony PVE-500* would be used as an interface for playing a game like chess or Ping-Pong, controlling any kind of computer or another objective. To actualize this project and re-animate *Sony*

PVE-500 in different operation, would be possible with enough engineering and technical skills. Because it is a *editing control unit*, we found that it provides its communication via timecode. In other words, the data language between *Sony PVE-500 Editing Control Unit* and Betacam Players is the timecode which should be transferred to each other. To create a connection, we should develop a specific software which generates timecode to send the control unit. With this type of software, the computer and the editing control unit can communicate with each other and it would generate a data which is usable for any kind of visualization program to create any different intended purpose for *Sony PVE-500*. This problems showed my position and a technically expected deficiency of the media student in this type of project.

Wolfgang Ernst mentioned this effort in *Digital Post Media Archaeology* part of his talk at Ankara: “Media Archaeology, even when applied by non-engineers, tries to get as close as possible to a technological understanding of media artefacts … its skill is to identify the technical details which are salient in terms of epistemological surplus.” (Wolfgang, 2017) The approach of Ernst enflames the problematic situation of the physical recalling and the position of the media student. The term non-engineer in Ernst’s mention belongs to people who work Media Archaeology field as media student, and media artists. This perspective leads to project another type of path and question as: “Does this project should save the device physically or is it possible to recall this device to contemporary media with another method?”. As a media student and Media Archaeology Lab laboratorian, I found a new method to recall the device by adapting a new and an alternate mode of operation to it.

However, it is impossible to recall the device physically within those conditions, inspiring from the device and mimicking it, there was the another way of sustaining the device and saving it from the circle of death in the upgrade age rather than developing a software and making a far fetched project. Errki Huhtamo (1995) mentioned this behavior as: “There are also archeologically motivated works that do not directly represent a certain gadget from the past, but adopt a more associative, collage-like approach.”. *Muybridge-500* which has collage and adoptive approach is the project which offers an alternative and a new mode of operation to *Sony PVE-500* and its j*og-Shuttle* from the perspective of a non-engineer media artist by using a motion sensor.

4.2 The Project: *Muybridge-500*

Muybridge-500 is an interactive video installation project which takes its origins from the *Edit Control Unit: Sony PVE-500* (Figure 14). The project’s name is the combination of the surname of famous English photographer Eadweard Muybridge whose works constitute the content and the inspiration of the project and *Sony PVE-500*’s model number 500. The project offers a unique experience to its participants where they are allowed to test the new mode of operation of the jog-shuttle and the movement in the videos by using a motion sensor. In other words, *Muybridge-500* is a test of jog-shuttle experience with anti-tactile air gestures by using another device which belongs to the contemporary media devices. The new or the alternative mode of operation is provided by the device called the *Leap Motion* which is founded by the *Leap Motion, Inc.* company with its founders Michael Buckwald and David Holz in 2010 (About - Leap Motion, n.d.).



Figure 14. *Muybridge-500*, by Boran Aksoy, 2018

The project *Muybridge-500* consists of three main tools: a computer, a projection and a motion sensor called the *Leap Motion*. The participant who is in front of the projected video, can control the multiple playback features of the video by using his or her hand gestures via the motion sensor with the help of a computer software called *MAX/MSP*. He/she is allowed to use six different gesture which are explained in the diagram to operate six different features of the new jog-shuttle which is inspired by and mimics the obsolete one (Figure 15).

The first gesture is the turning the index finger counter-clockwise which allows the participant to change the play rate in the negative direction to rewind the video due to continuity of the gesture and the rotation speed between 1 and -6. The second gesture is swiping which enables switching the videos. The third one is to stop the video with

the pushing down or lowering the hand gesture as it is close to same gesture with the old jog-shuttle belonging *Sony PVE-500* (Figure 16). When the participant elevates his/her hand which is the opposite of the pushing down, the video starts to play and this is the fourth feature of the project. The fifth gesture is called the "Finger Dance" that consists of swinging the fingers to reset the play rate to normal if the participant leaves the video in rewind or forward mode. The last and the sixth gesture is turning the index finger clockwise which allows the participant to change the play rate in the positive direction to forward the video due to continuity and rotation speed between 1 and -6. The order of the gestures are set or linear, the participants can play with, experience, command or control the videos by using any of these six gesture in any order.

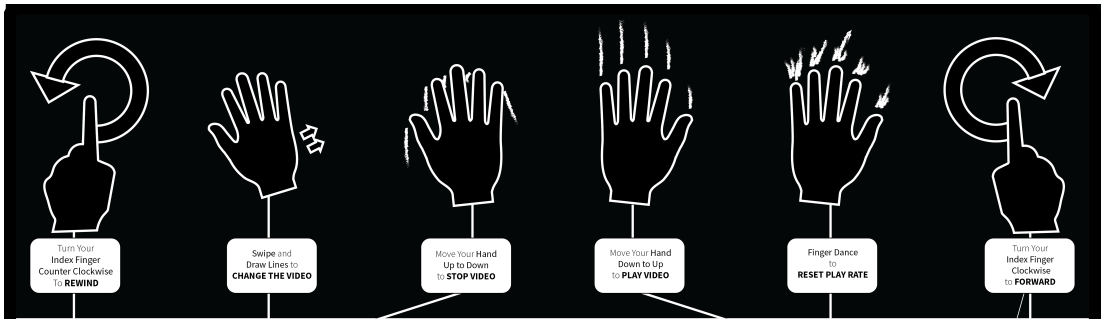


Figure 15. *Muybridge 500*'s Instructions Diagram

Muybridge-500 includes four different videos which can be the sample group to experience this type of jog-shuttle. The first video and the main inspiration for the content of the project is created from the Eadweard Muybridge's *Animals In Motion* project. I collected the sequential photographs from the book which is called *Horses and Other Animals In Motion: 45 Classic Photographic Sequences* to create the

original footage (Muybridge, 1985). From twenty four photographs composing one photographic sequence, I created a motion picture (Figure 17).

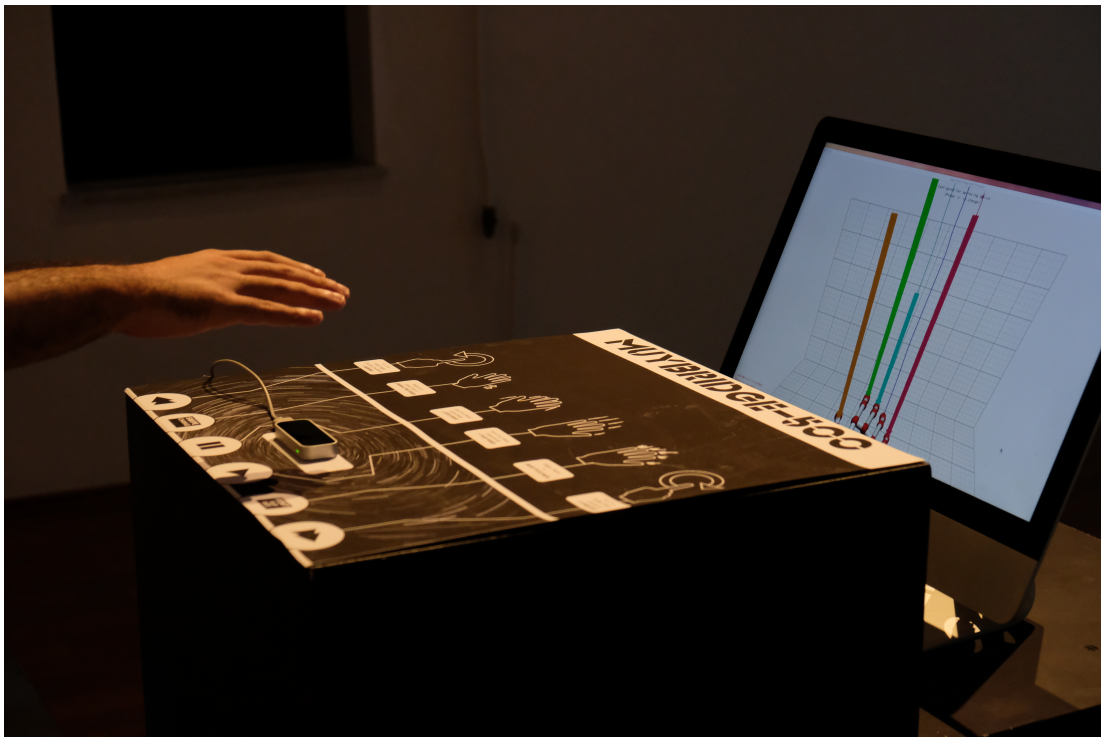


Figure 16. Muybridge-500, Stop Video Operation



Figure 17. From Muybridge's *Animals In Motion*, as the First Video of *Muybridge-500*

Further, from the inspiration of the inventor of motion picture, I shot three different videos which are for testing the movement in the video as Muybridge did. The second video is a direct inspiration from Eadweard Muybridge's horses and it is the contemporary version of it. A horse ambles which means legging, shot with camera stabilizer at 100 frames per second and to demonstrate the movement, it was slowed

down to 200 frames per second. The third video is the bicycle riding which adds movement to a vehicle and multiplies the movement in the video. The last video represents one of the fastest motions that can be done by a human which is figure skating (Figure 18). The figure skater draws a line in the middle of the frame and she whirl around and passes out from the image. In addition, as the contemporary horse video, both of these videos were shot at 100 frames per second and slowed down to 200 frames per second to demonstrate the movement in the videos. The common features of all four is the “movement”. Towards the end of 1800s Eadweard Muybridge tested the movement and motion of animals and human beings.



Figure 18. Figure Skater Video of *Muybridge-500*

These contemporary shootings which are created by me try to test and experiment the movement with the operation features of new jog-shuttle originating from the scientific and artistic experiments of Muybridge.

The first application of the project was located in İ.D. Bilkent University, FADA Exhibition Hall for the “MFA on Media and Design Graduation Exhibition”. The project consists of a high lumen projector, a computer with *MAX/MSP* and the *Leap Motion* driver installed on it, a *Leap Motion* motion sensor and five pedestals. These were established in a dedicated room in the exhibition hall. The room was sunlight prohibited and the aura of the area became closer to the editing rooms where are generally situated at the basements. To make the *Leap Motion* run efficiently and to emphasize the author position of the participant, the pedestal where the *Leap Motion* is positioned on is enlightened with a small spotlight. The other light source became the projection screen which is approximately six square meters (Figure 19).

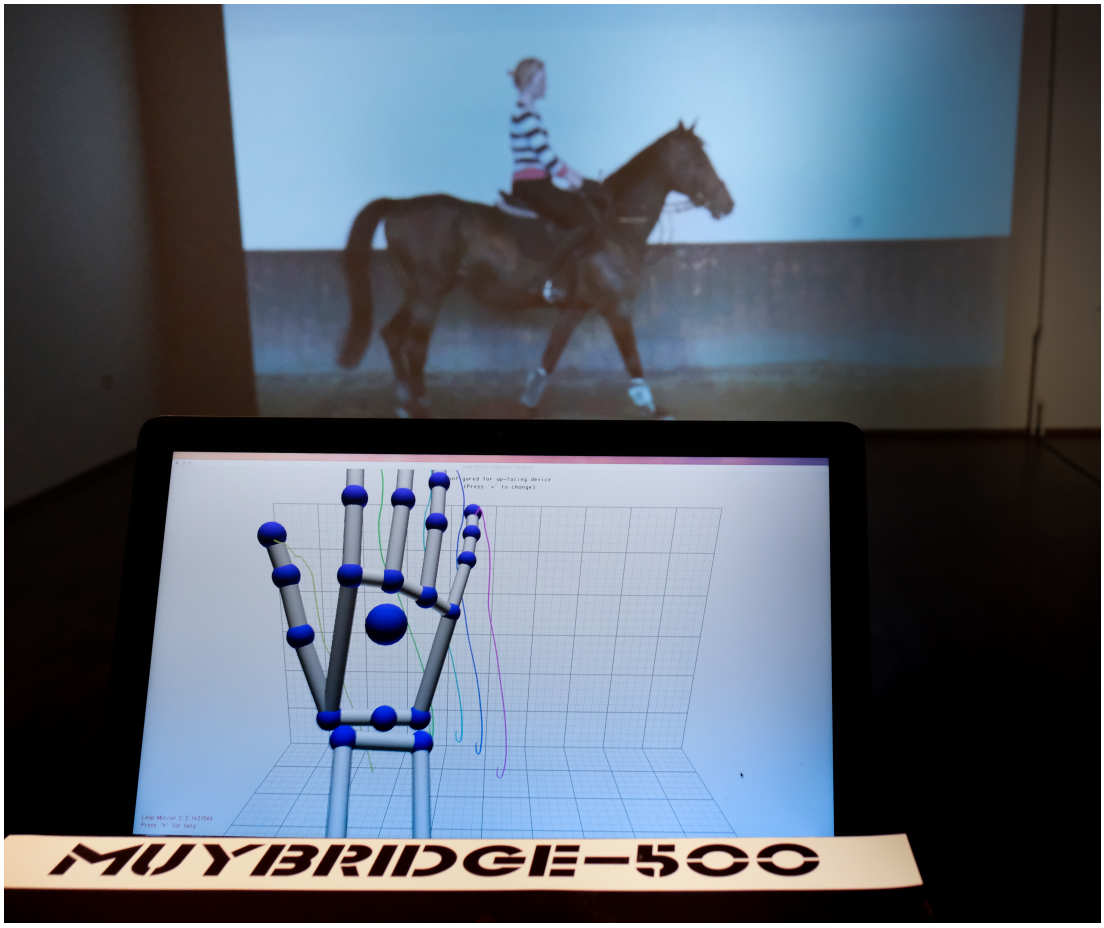


Figure 19. *Muybridge-500's* Projection Screen

The installation has an impression of the editor position with a big controllable screen. There were two main aims of creating this kind of screen. The first one is creating a contrast between the size of *Leap Motion* and the screen. The work constitutes the perspective of small gestures controlling screens in the opposition of nowadays screen controlling technologies. For example, people operate smart phones with giant gestures due to size proportion of their screens. *Muybridge-500* creates the contrast and the opposition to today's controllable tactile screen technology with anti-tactile small gestures. The second feature of the projection is the positioning of it. The bottom of the projected image touches consciously to the ground to connect with the spatial area. The test or the experiment made by Eadweard Muybridge is to understand and prove whether all four legs of a horse were leaving the ground while the horse as galloping or trotting. The perspective of this experiment and the relation to the ground is transferred to *Muybridge-500* with the positioning of the projected image. This kind of positioning helps participant to create a direct relation between the movement and the ground with a ground touching projected image on a wall. In addition to these, a computer screen with the *Leap Motion Diagnostic Visualiser* (Version 2.3.1+31549; Leap Motion, 2010) on it creates a guide for the participant. The participant can see his/her hand movements on the screen to increase the usage efficiency and the project becomes easier to operate with this kind of gesture visualizing software.

At the back of the *Visualiser* screen, there is the software which builds the infrastructure of the project *MAX/MSP* (Version 7.3.5; Cycling'74, 2016). It is a visual programming software which is generally used for music and media projects

or software developing. In this project, *MAX/MSP* has a role of the analogue electrical circuit as *Sony PVE-500* had. It is responsible from getting the data which is created by the hand movement and gesture of the participant which are collected from the *Leap Motion* and it turns these data to commands to the features of the jog-shuttle. In the great scheme of things, *MAX/MSP* is the base of forming new and alternate mode of operation for the jog-shuttle.

"Media archaeology is introduced as a way to investigate the new media cultures through insights from past new media, often with an emphasis on the forgotten, the quirky, the non-obvious apparatuses, practices and inventions." (Parikka, 2012) The reason of transferring the knowledge and the features of the jog-shuttle to a new medium as the motion sensor with new and alternate mode of operation is the main question of the project and the paper. The alternate mode shows the possible and new pretended usage for the jog-shuttle in the digital world. The transference and the new usage of the jog-shuttle carries a significance other than rescuing. It is also for merging past new media devices with a contemporary media device. The motion sensor and the analog editing control unit merged by knowledge and the mode of operation transference. The importance of the term "past new media" which was used by Jussi Parikka (2012) matches with the condition of *Sony PVE-500* or the jog-shuttle as a material. The term "new media" has been used by Lev Manovich doesn't fit the Parikka's terminology because Parikka uses the term new in a temporal aspect. Furthermore, Lev Manovich (2001:49) in "What New Media Is Not" in his book *Language Of The New Media*, positions new media directly against to film or videotape. "New media allow for random access. In contrast to film or videotape,

which store data sequentially, computer storage devices make it possible to access any data element equally fast." If we look from the perspective of Manovich, a film strip or a videotape which is linear can't be randomly accessible. However, film or a videotape is not randomly accessible since they are linear, the jog-shuttle and *Sony PVE-500* allowed their users to move fast and access the content easily with their features. Parikka's term is close enough to Manovich's debate on new media. That is to say, *Muybridge-500* is the combination of the past new media and the contemporary or present new media. In addition to this, combination of the device and the new mode of operation is provided by the motion sensor are not the unique part which creates the newness in the project. The videos shot by me and the original footage from Eadweard Muybridge is another combination of the past new and the contemporary media. The experiment which was done by Eadweard Muybrige is one of the examples of past new media. Even if it constitutes the linear form of the picture as the motion picture, Muybridge's sequential photography which was done with a scientific methodology is the new media for the past meeting with the contemporary media products: the videos of *Muybridge-500*.

4.3 Edweard Muybridge and the Movement Test

After giving up to recall and recover the device physically, *Leap Motion*: the motion sensor gave the project its direction as the medium itself. The variation of usage area of the motion sensors has led me to think on the content. While doing the knowledge transference from analogue to post digital, *Muybridge-500* didn't have an editing function as *Sony PVE-500*. To remind the relation to cinema without the editing function, *Animals In Motion* by Muybridge which is accepted as the first motion

picture is used. Furthermore, Eadweard Muybridge's photographic sequences have a scientific background and an experimental methodology which are close to *Muybridge-500*'s approach. In addition to all these, the movement test that Muybridge did matches with the new mode operation of the jog-shuttle which is experiencing the motion and gesture.

Eadweard Muybridge as a photographer was supported by United States Government to shoot series of views for them. In 1872, Muybridge conducted an experiment to solve the problem offered by Leland Stanford as "at some point during a fast root, a horse will have all four legs off the ground simultaneously." (Muybridge, 1985). In order to prove the claim, Muybridge tried to use photographic evidence. The result of this experiment led to the birth of the first motion picture/moving picture which is accepted as the ancestor or the very first base of cinema. That is to say, the first *Animals In Motion* which is an evidence of a scientific experiment, has led Eadweard Muybridge to be credited as the inventor of the motion picture.

In *Animals In Motion* the first part of the motion series *The Human Figure In Motion, The Male and Female Figure In Motion* started with the first experiment with the claim put forward by Leland Stanford. The importance of this experiment is having a scientific background. In other words, this experiment follows many technical procedures. First, at the time of Eadweard Muybridge, there was no chance to document instantaneous shots of photographs because of the technical facilities being only the plate technology. Stanford and Muybridge and the engineer team invented a plate which can work faster in shooting and recording time. Marta Braun mentioned

the scientific process of Eadweard Muybridge in her book called *Eadweard Muybridge: Critical Lives* as*:*

> It took considerable ingenuity to make the wet plate produce an instantaneous image. And Stanford and Muybridge proposed to make not just one image, but a series of them. To achieve their goal, they would have to rethink almost every aspect of the medium. (Braun, 2010)

The another problem for Muybridge was the shutter problem of the machines. In other words, if you want to take a photograph, the shutter was provided by the lens cap and the photographer should wait seconds to expose the photographs. It was impossible to shot a instantaneous and fast photograph by this technique. Muybridge and the team invented a trigger for the shutter of the machines with the help of magnets to shot series of simultaneous photographs. The new shutter system and its results were named as the "Automatic Electro-Photograph" which met the shutter technology with the electricity. The last thing was building the whole setup to shot. The setup was established with twelve cameras which were computationally placed (Figure 20).

The whole arrangement of this setup was for constructing an experiment to understand and prove the movement of a horse. *The Project: Muybridge-500* is also a way of experimenting the user experience of jog-shuttle on a different medium. As a non-engineer, I transferred jog-shuttle to another, digitalized hardware as the *Leap Motion.* Muybridge's original experiment is also an invention. However, *Muybridge-500* has not done with the purpose of inventing a new jog-shuttle, the project carries the inventory features if we look at from the perspective of

technological development. Furthermore, it doesn't aim to prove something scientifically, its priority is on the changes on the different modes.

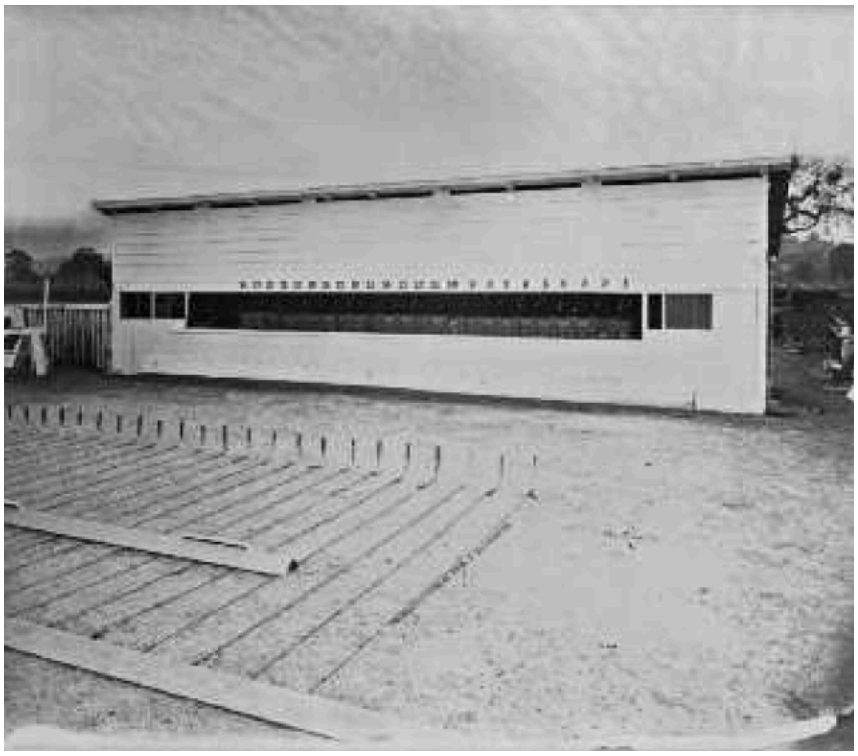


Figure 20. Muybridge's Horse Shooting Setup

Another reference point of the project becomes the content of the experiment itself. The experiment which was done by Eadweard Muybridge can be named as a "movement test". The actual aim of the project is stopping the time to see the movement of a horse. The project: *Muybridge-500* is bringing together the test of the movement with the user experience. The user sees the camera movement and video movement in the projected screen. The movement in the videos can be controlled by the user with the hand gestures being perceived by the *Leap Motion*. In other words, *Animals In Motion* offers stopping the time and shows the movement, *Muybridge-500* contributed to this test with a "controllable movement" with hand

gestures of the user to see the fluency of the movement, random and fast access of the point. This feature is not only provided with the help of a motion sensor, it is also related to the contemporary shooting technologies. The videos which are inspired by Eadweard Muybridge were shot with contemporary technologies as slow-motion. The first difference, even if we accept that Muybridge's photographic sequences as a motion picture, *Muybridge-500* consists of videos rather than sequential photographies. The videos are recorded in 100 frames per second and they are slowed down two times. The process of slow-motion shooting and post-production is the part of the movement test of the digital world. The videos are eight times slower than today's world cinema standards and approximately sixty six times slower than Muybridge's horses. This facility of shooting slow-motion makes easy to see the movement in the contemporary digital world.

The new videos which were shot by me create a hybrid work with Muybridge's video. While the process of digitizing the jog-shuttle, the content should be transferred to the digital medium. The recording process of the videos are digital but the the content should belong to contemporary world as well. As it is mentioned in the chapter "4.2 The Project: *Muybridge-500"*, the project consists of four videos. The first video is the the original footage from Eadweard Muybridge. It is related with the movement test and being milestone for the cinema. In addition to this, it represents the discrete push function of the old jog-shuttle rather than fluent motions. The other three is aiming to recall Muybridge's experiment to the contemporary or the digital world. The horse video which was shot by me, is the direct reference to the Muybridge's horse to see the movement fluency. It emphasizes also single

camera facility to record continuing and instant movements. Second one, the figure skater video is the one of the fastest movement which can be done by human figure. With the help of developing technology, it is possible to see and easily record the fluent movement in such a speed. The last video is the bicycle which is conducted by me. There are two reasons for using bicycle and imported to this project. First, bicycle is the obvious visual representative of the modern world and I use myself as a contemporary subject.

4.4 Implementation of The Project

The technique which is used in *Muybridge-500* is formed with several parts. The transition and transference from analogue to digital have different procedures. The first basic structure of the technique of the project is mimicking the circuit. The aim of the used technique reflects the analogue automation with digital data and software. For circuits, there are mechanical procedures and automations which provide the communication between the user and the mechanical interfaces. In other words, for the mechanical analogue based devices as *Sony PVE-500*, the procedure or the process works electronic based for operations. In analogue devices, circuits directly communicate with each other to interpret the commands which are coming from the gesture of the user. Pushing, scrolling or other types of gestures which were designed and serviced by the interface of the device are used to realize the commands. Sony PVE-500 editing control unit works: when the user pushes the buttons or turns the wheel, circuit commands the player or the recorder via encoding the time code. Especially for the jog-shuttle wheel, there is an optical sensor and a designated circuit to understand the operations.

For the computer based operations, the system differs from the analog system. Even *Sony PVE-500* communicates with data as the time code, computer based system is not directly operated with circuits, but also with software. While *Muybridge-500* transfers the mode of operation and the knowledge of the jog-shuttle, it also changes the techniques of the operation and automation to resurrect the obsolete device. *Muybridge-500* with the motion sensor transfers the automation that circuits did to the digitized area with a code based software. *MAX/MSP* is the software which constitutes one of the biggest parts of *Muybridge-500*'s background. In addition, *MAX/MSP* can be regarded as the software which mimics the operation of the analog device. The program is described as connecting "objects with virtual patch cords to create interactive sounds, graphics, and custom effects." by its company Cycling '74 (Retrieved June 29, 2018, from https://cycling74.com/products/max/).

The first stage of the artificial circuit design by the software is the integration of *Leap Motion* with the *MAX/MSP*. Even *MAX* is a code based program which is C++ , the user of the program doesn't need to know or perform coding. *MAX* turns the groups of codes into objects, messages, sliders, buttons or commands which work in the patcher or on the board of the software. These facilities provide creating an interface which is mainly inspired by the analog interfaces. In other words, *MAX* uses types of automation which were pre-programed to create commands. In the project to integrate the motion sensor to *MAX/MSP*, it used another pre-programed object called the *leapmotion.maxhelp* which was inspired by *aka.leapmotion* by Masayuki Akamatsu (Retrieved June 29, 2018, from http://ismm.ircam.fr/leapmotion/). After

Leap Motion driver, the *leapmotion.maxhelp* object became the conductor of *MAX/MSP* to get the *Leap Motion* skeletal tracking data (Retrieved June 29, 2018, from http://ismm.ircam.fr/leapmotion/).

The object *leapmotion.maxhelp* is developed for using *Leap Motion* with *MAX/MSP* has a pre-designed gesture recognition system in it. The gesture recognition interprets from the data which comes from the gesture. In other words, the gestures which are perceived by the infrared technology and the IR cameras in *Leap Motion* are turned into intervals depending on the shape and the motion of the hand on x and y axis. The six commands of the *Muybridge-500* are perceived by the *Leap Motion* with intervals (Figure 21).

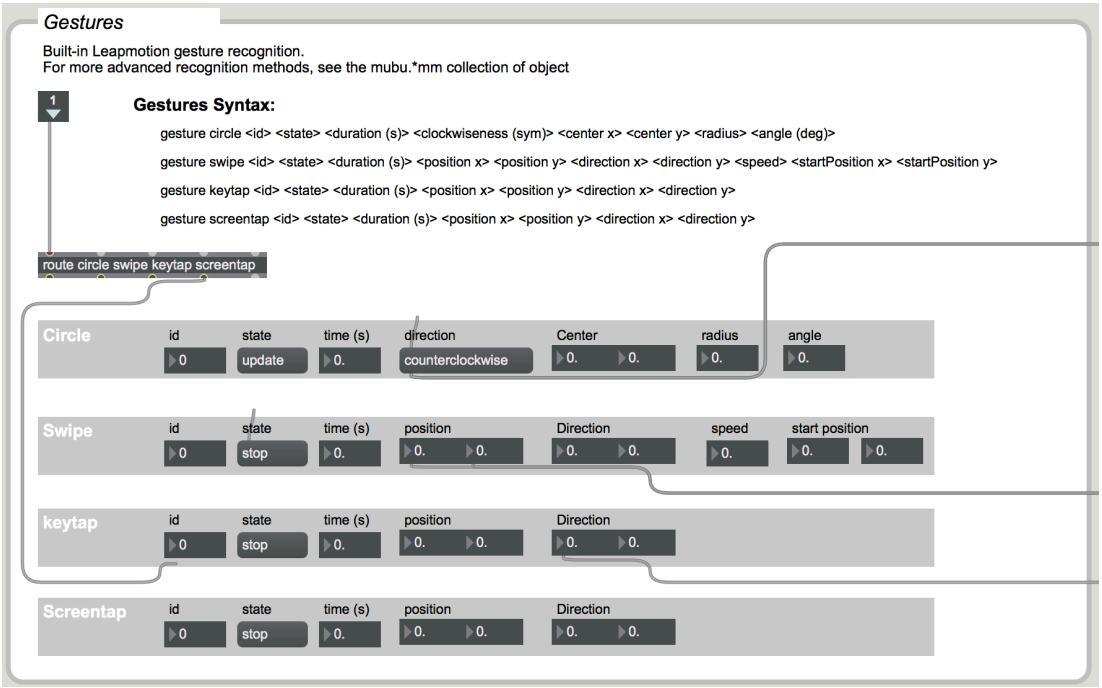


Figure 21. Gesture Implementations of *Muybirdge-500* in *MAX/MSP* File

The first pre-programmed gesture “circle” is assigned to forward-rewind commands. It mainly depends on the direction and speed of the gesture. The second one “swipe” is for transition command to skip the videos. The third one which is the “keytap” is linked to the “finger dance” gesture which resets the play rate of the videos. The last one “screentap” is assigned to stop and start video commands when the user pushes and lifts his or her hand. The “id” part is to create the identity of the gestures which is gathered from the *leapmotion.maxhelp* object. The “state” part is between update and stop runs or stops the commands which allow the operation. The “position” and the “center” boxes are to understand the gesture between designated intervals. In addition, The “direction” boxes have two different modes. First one is the direction of the finger as clockwise or counter-clockwise to forward-rewind. The other one is related with the direction of hand again depending on the designated intervals.

Outputs of the gestures are linked to commands and operations in the whole automation system of *Muybridge-500*. The four gesture objects are interlocked with different objects as sliders, rate determinant, etc… First gesture which forwards or rewinds the video by turning the index finger is directly inspired by the obsolete jog-shuttle (Figure 22).

The *zl.compare* objects are to understand the direction of the gesture and they send their output to *qmetro* object. The *qmetro* object is the queue based metronome which can be interpreted with an interval sends the output temporally. The play rate changes with the act of the slider which all the objects are linked to a slider where is placed at the right bottom corner of Figure 22. *Dec* and *inc* messages which are controlled with

the data coming from the *qmetro* object allow changing the direction and the speed of the timeline. This group of objects allow the user or the participant of *Muybridge-500* to forward or rewind the video on the screen depending on the speed of the gesture by changing the play rate.

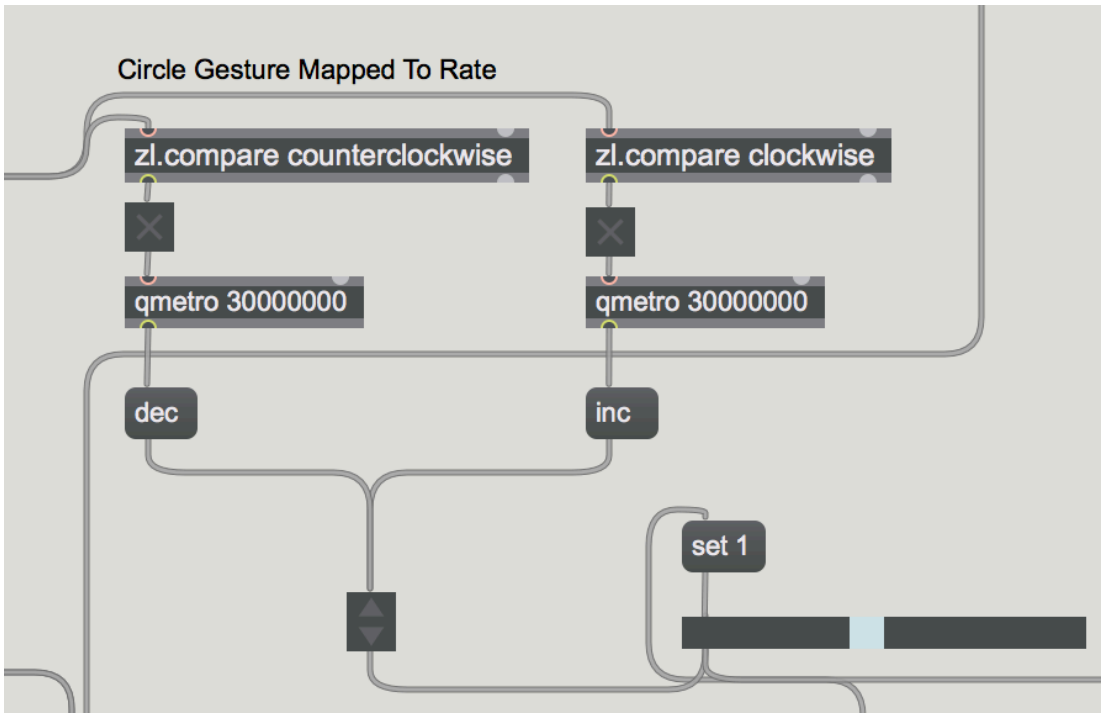


Figure 22. Circle Gesture Command in *Muybirdge-500 MAX/MSP* Project File

Scale objects map an input range to various integer output values (Figure 23). For switching the video (Swipe Left Mapped to Switch Video), *the scale* object are programmed with input low number as "1" which is the minimum and input high number "120" as the maximum. The relation between the four numbers are if the input is "1" and the output is "0", it designates the beginning of the gesture. If the value which comes from the data swipe gesture is between 1 and 120, the output is "1" to run the commands and start the operation. The reason of the interval between

1 and 120 as the input-low and input-high is read and understand the possible differences in gestures which would be done by the different participants. The *delay* object is to avoid the mixture of the commands. In other words, while the user is changing the play rate, if he/she wants to give another command, the *delay* object which works with milliseconds becomes the barrier between the two commands having the possibility of engaging with each other. The start and stop video command part (Swipe Down Mapped to Start Stop) of the patch is linked with "screentap" gesture works similar as the swipe gesture (Figure 23). The difference between them is *the sel* object. *The sel* object creates the selective output. If the user swipes down or pushes his/her hand, the output become *sel 0* which results as stopping the video. If the user swipes up his/her hand, the output will be *sel 1* and it plays the video. The last groups of object in Figure 23, is the gesture "finger dance" works similar as the "swipe" gesture working principle.

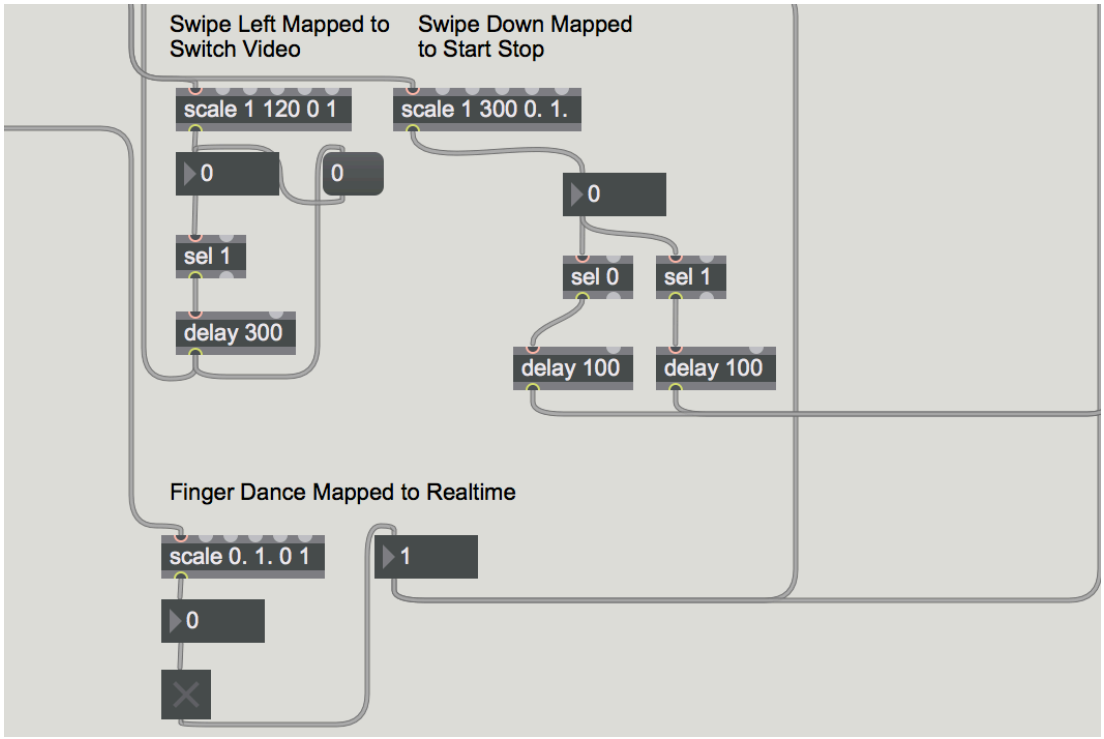


Figure 23. Switch Video, Start & Stop and Reset Play Rate Commands

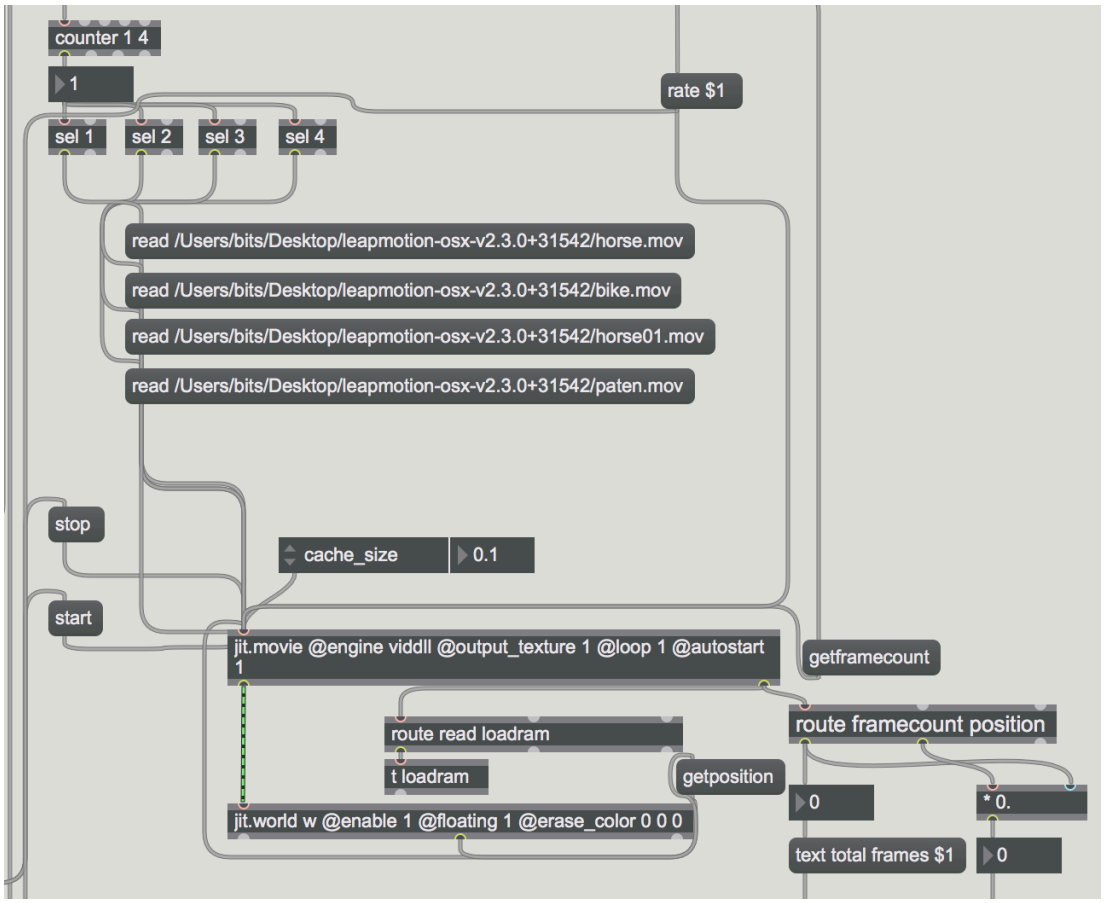


Figure 24. The Video Part in *Muybirdge-500 MAX/MSP* Project File

The biggest part of the patch which is the output of the project projecting on a wall is the *jit.movie* object part (Figure 24). Since *MAX/MSP* can be regarded as the audio based creating software, it uses a pre-programed object called the *Jitter* to play the videos. *The jit.movie* which one is of these objects gathers all the data and object outputs into it and plays the videos. *The counter* object is programmed to read the data which is coming from the swipe gesture decides which video will be played on the screen with the help of *the read* messages which are addressed in the computer. The result of the decision become the input of *jit.movie* object which has the role of a video player and it send its output to *jit.world* object to display the image in a separate window.

The last part of the patch is the data displaying (Figure 25). The play rate number is between -6 and 6, the current frame rate and the total frame of the playing video is displayed on the right corner of the video. In Figure 20, *the getframecount* object sends the data to “rate text output” which is placed on the video. The position and the placement of the texts on the video are provided by the *jit.gltext2d* object. In addition, *the rate $1* message in Figure 20, sends the interval to demonstrate the play rate between -6 and 6 for its participant. It has two purposes of showing these data on the screen. First one is to control easily the forward-rewind operations by the user. The second is related to the time code editing. *Muybridge-500* is not an editor or an editing control unit but it references and remembers the data in the editing field. It is not directly showing the timecode but it gives the temporal based control via frame rate.

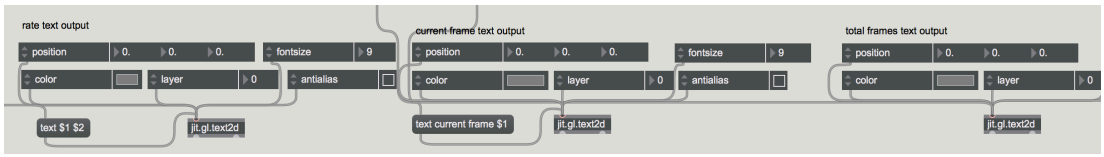


Figure 25. The Data Display Part in *Muybirdge-500 MAX/MSP* Project File

The whole technical part of the project consists of these elements which software based. These explanation of the technical background of *Muybridge-500* describe the circuit mimicking on a software and the technical process of recalling the jog-shuttle with a computer software.

4.5 The Motion Sensor and The Gestural Control

Since the world has become more technology integrated, people started to live in a life which is absorbed by technological devices. The devices have different features which have different controlling operations. For example, after the birth of television, the remote control was invented. Now, televisions have air mouses to control their operations. The change in the operation control devices is developing by the usage of different devices. Motion sensors are important elements of this change in our daily lives. Even if they have different intended purposes as security systems, they are usually used to control the operation of other devices especially as gestural control. It is the technology which can be regarded as the complementary for other devices to actualize the operation. The intended purpose of the motion sensors as a gestural control is for example, in some cars to operate the multimedia systems, to steer a drone, or playing a game in virtual reality.

Gesture is a communication tool for humans. After the advance of technology, gesture became more than being a tool between humans. The tactile interface helped gesture to become another tool between human and machine interaction in the technological field. First, the gestural communication between human and machine emerged with data gloves. It is the technology that allows the get input data flow from the position and the movement of the hand. Without a physical interface and an actual physical touch, *data gloves* send the data to the computer to operate the content. The motion sensors or vision based gesture recognition systems are more complex versions of gestural control in human-computer interaction with an anti-

tactile perspective. The strict difference of motion sensors from other gestural control devices is the characteristic of being anti-tactile. The improvement of this touchless gestural control or the gesture recognition became a language that forms a dialogue between human and computer. This interaction is explained in *Vision Based Hand Gesture Recognition* as:

> In fact, gesturing is so deeply rooted in our communication that people often continue gesturing when speaking on the telephone. Hand gestures provide a separate complementary modality to speech for expressing ones ideas. Information associated with hand gestures in a conversation is degree, discourse structure, spatial and temporal structure. So, a natural interaction between humans and computing devices can be achieved by using hand gestures for communication between them. (Garg&Aggarwal&Sofat, 2009)

The expressive feature with gestures can be adapted on human computer interaction via gesture recognition systems. Furthermore, editing act can be accepted as an expressive operation when the editor starts to cut. In other words, assemblages of the video clips are a way of expressing new meanings by the storyteller. Even the tactile interfaces are generally used in the editing field as editing control units, mouses, keyboards, touchless gestural control provides a new operation to this communication and expressive act.

Muybridge-500 uses this anti-tactile operation controlled via hand gestures using the *Leap Motion* motion sensor. Using the *Leap Motion* while transferring the jog-shuttle to another medium in the new mode of operation rather than another gestural control device has multiple reasons. First one is related with the surface and the way of using of obsolete jog-shuttle technology. *Sony PVE-500* has a very solid interface. Furthermore, the buttons are mechanical. While the user or the editor is actualizing

the editing procedure with this device, he/she knows that they are working with an analogue and a mechanic device. In these years as the usage of *Sony PVE-500*, there are more soft controllable devices in the analogue field. Because of *Sony PVE-500* has a operation which can be accepted rigid as the jog-shuttle can be controlled with hard-pushing, the transference of the medium should contain a softer interface. These features changes the physical bodily action type of the operation. The second reason to choose a motion sensor is about the interface again. The physical or bodily interfaces are the instruction materials for their users. In other words, human got used to operate tactile interfaces for a long time. Buttons, texts are the guidelines for the user to control or use the devices. *Sony PVE-500* has the interface with a textual explanation and the designated buttons, even though, *Leap Motion* doesn't have a designated interface. The last but not least reason of using motion sensor to control *Muybridge-500*, is the innovative feature of the motion sensors in the technological field. Personally, I believe that the motion sensors are at the center of commanding technologies. Especially, they take place between the tactile and physical interfaces and the brain computer interfaces on the human-computer interaction. The air gesture type of commanding is a contemporary command tool which is used widely in different fields. From an innovative point of view, the motion sensor is a way of expressing and commanding new media devices. Before brain communication spread in people's daily lives, the motion sensors are the latest technologies which can be applied in any interaction between human and machine.

Leap Motion is one of the vision based gesture recognition systems especially for the hand movements. It is specially designed for the virtual reality experience and to

increase the interactivity experience in virtual reality projects. The main purpose of the device is to create a human-computer interaction with input which is derived from the hands. The system of *Leap Motion* detects its users palm position, finger movements, hand heights, whole hand movements, special gestures and it digitizes to transfer them to computer via a USB port. The mechanic structure of the *Leap Motion* constituted with three infrared lights and two cameras which receive infrared lights (Shao, 2016). These technical structures via infrared technology help to digitize the hand of their users (Figure 26).

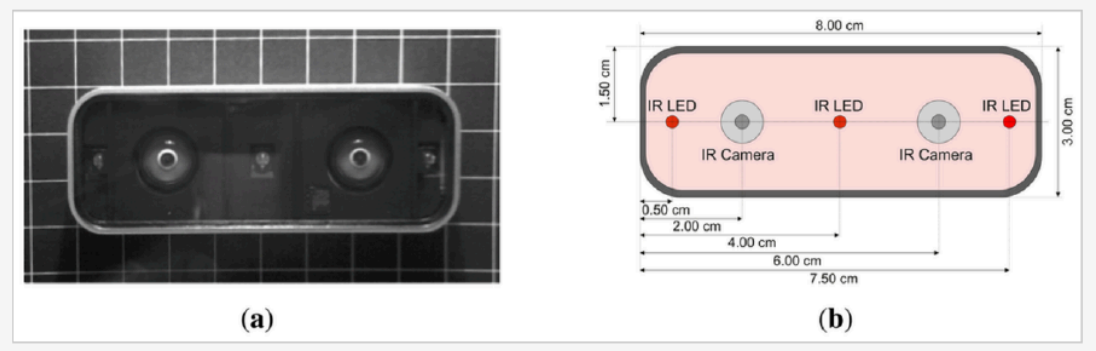


Figure 26. *Leap Motion* Infrared and Camera Technology

The data which comes from the hardware turns into a skeletal tracking in the computer. The driver of *Leap Motion* helps to digitize the hand movement in different software. By integrating *Leap Motion* to the computer, *Leap Motion Diagnostic Visualizer* and the setup of the hardware are installed to the computer. *Leap Motion Diagnostic Visualiser* allows to see the skeletal tracking data on the computer screen by showing the virtual hand on the three dimensional space (Figure 27). It is a way of training and getting feedback to see the technical problems and to constitute the user interaction easily.

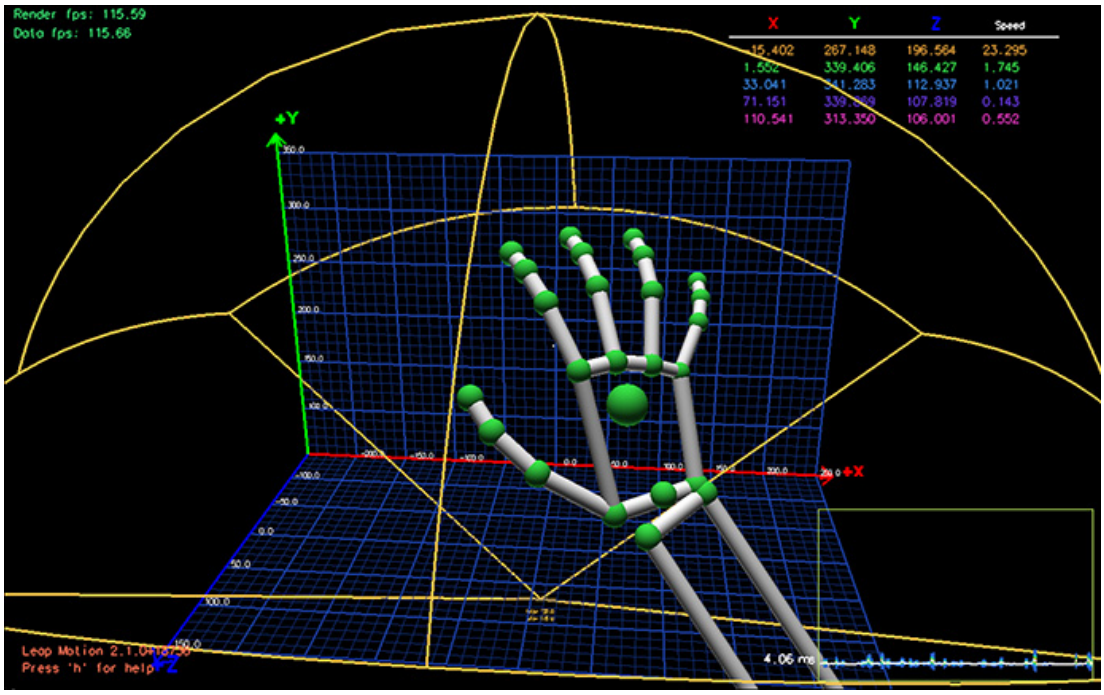


Figure 27. *Leap Motion Diagnostic Visualizer*

In this project, *Leap Motion* as a motion controller acts as the operation device. The gestures to command on the video and play on the timeline are detected by this device and processed with the help of *MAX/MSP.* Especially, the data coming from the movement, position, speed of palms and fingers are the operative controls which are converted to computer by *Leap Motion*. Using a motion sensor as an operation control unit is a way of differencing the tactility which also manifests the differences between obsolete jog-shuttle and the new jog-shuttle which has an alternate mode of operation.

4.6 The Jog-Shuttle and *Muybridge-500* the New Mode Of Operation

From the media archeological perspective, it is not convenient to create a comparison between the two devices, the jog-shuttle and *Muybridge-500*. In other words, this project can't be examined on a linear timeline as the new device and the old device

even if they belong to their temporal era. That is to say, it is impossible to say that either one of them is better than the other even according to their user experience, functionality or design features. The only thing that can be compared is “How they differ from each other?”.

The old new jog-shuttle belongs to *Sony PVE-500,* is the device which was used in the professional area. It is a device in the professional broadcasting field which was used to make editing and to reveal a composite final cut. The general type of usage can be examined on the field. The way of using *Sony PVE-500* was summarized as: one user is the controller of the device. He/she has one or two video input which are constituted by the shootings for the final cut. The shootings are deconstructed by the editor with the help of the time code, the editing decision list or etc… The editor decides on the points which lead him/her to his/her final decision. Then, he/she does the editing. The construction act is actualized by the editing process. The result of all of these acts generates one final output. The final output is the video which has specific beginning and ending points.

The new jog-shuttle assigned to *Muybridge-500*, is used as a part of the artwork. It is not related with professional usage in the editing field. It is a way of experience testing which was inspired by the mode of operation of old new jog-shuttle which belonged to *Sony PVE-500*. In addition, even we use jog-shuttle’s mode of operation in our daily lives with other technological devices, *Muybridge-500* brings the jog-shuttle with a different medium as the motion sensor in daily life usage. Jesper Olsson explains the process of bringing these kind of objects to daily life as: “the re-

contextualization of media objects from their circulation in everyday life into the lab environment would, potentially, produce new knowledge about them." (Olsson, 2016) The re-contextualisation process of the old-new jog-shuttle from editing rooms to media archaeology lab, then from the media archaeology lab to exhibition hall or to daily life, creates new knowledges related to it. In addition, this project also brings the jog-shuttle in the exhibition hall (Figure 28).



Figure 28. *Muybridge-500* in Bilkent University FADA Exhibition Hall

The way of using a new jog-shuttle as the project *Muybridge-500:* one user becomes the author in the project. Multiple users are not allowed at the same time like in the old editing system. Since there is physical tape, due to facilities of the computer's RAM and, the processor and the graphic card, there is no limit of input. In other words, *Muybridge-500* can be expanded with the improvement of the computer and it

can include hundreds of videos. The user can decide to choose from different videos. The main operation of the *Muybridge-500* is the movement test and the gestural control rather than cutting the videos. Furthermore, the project and the new mode of operation is experiencing and playing rather than creating a composite output.

The other difference between these two arises from the usage areas. Since the old-new jog-shuttle is used in professional area, the intended users are the skilled users. The experience of the old-new jog shuttle which belonged to 1993, with having an interface covered with the terminology that belong to professional field, is more basic. Furthermore, the tactile interfaces as wheels have more background on human machine interaction. In other words, human get used to operate devices with tactility. *Muybridge-500* is a project which breaks this system with an anti-tactile operation. The negative aspect of the touchless control is the operation problems rather than the tactility issues. Even the motion sensors are the contemporary devices and spreading in our daily lives, operations with the air-gestures or gestural control via motion sensors are harder than the usage of tactile devices in terms of usability. If the participant has not enough knowledge on using a motion sensor such as the *Leap Motion*, he/she can have a hard time while operating the system. In addition to these, because of the absence of the physical interface and since the *Leap Motion* is like as a black box, *Muybridge-500* offers its participants a diagram showing on how to operate the videos. All these facility problems were valid for the participant who experienced the project in “Bilkent University Master of Fine Arts in Media and Design Graduate Exhibition 2018” and similarly at school, in daily life

environments. To solve this difficulty and make more controllable the mode of operation, *Muybridge-500* uses *Leap Motion Diagnostic Visualiser* (Figure 29).

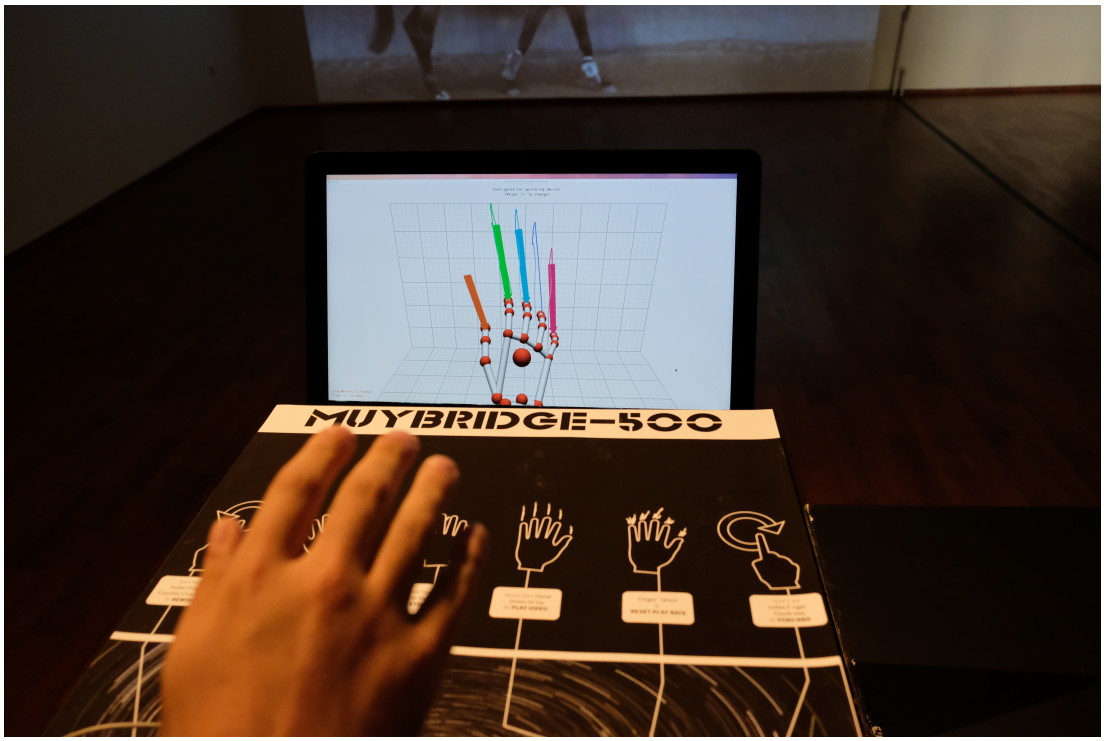


Figure 29. *Muybridge-500* with Leap Motion Diagnostic Visualizer

The visualizer is a virtual three dimensional space environment. It mimics the skeletal tracking data and it turns the user's hand to a virtual hand. The participant can use both two hands while using the Leap Motion and the visualizer demonstrates and gives live feedback of the hands, hand movements, fingers, finger movements of them. At the first stage of the project, this screen was not included in the project. The usage capabilities of the *Leap Motion* or in generally motion sensors, create more user friendly experiences. The visualizer shows the lines with the movement of the participant. If the lines are thin, it means that participant's commands weren't perceived by the *Leap Motion*. By the thick dashes which comes with the movement

of the participants, hand demonstrated on Figure 25 (which is the screen tap gesture that stops the video), the command works and the participant can figure out the gesture and command relation. Even it is not comparable with the analog jog-shuttle, that is to say, learning to use the motion sensors takes time.

Another difference between the transference of analog and mechanical device to the digital touchless medium in an art project is changing the interaction type. In most of the interactive projects, interactivity are related to the idea of touching. Erkki Huhtamo mentioned this kind interaction in his article called "Twin–Touch–Test–Redux: Media Archaeological Approach to Art, Interactivity, and Tactility" as:

> physical bodily action—one that involves more than just movement of the eyes—takes place. One touches the work, often repeatedly—either physically, by stepping on a pressure-pad, fingering a ''touch-screen,'' clicking on a mouse or pressing a custom-made interface, or remotely, mediated by a videocamera, sound, light, or heat sensors, and so on. (Huhtamo, 2007)

Huhtamo's perspective was constituted on the contrary of the art as a "distant image" and the tradition of the untouchable artworks which continued for hundreds of years. *Muybridge-500* is one of the artworks that doesn't form a relation as a distant image with its participants. Even there is no actual touching or contact with a physical interface in *Muybridge-500*, it offers its participant a virtual touch sense with a touchless operation. Because there is still bodily action with hand gestures to operate the screen.The closest example of *Muybridge-500* is the Paul Sermon's *Telematic Dreaming* (Retrieved July 1, 2018, from http://www.paulsermon.org/dream/) . *Telematic Dreaming* does not offer its participant a direct touch as an interaction, it creates a "teletouch" between the two participants of the work with a

videoconferencing system. The participants of that work who are physically distanced do not actually touch each other but the *Telematic Dreaming* provides a sense of touchable interaction with its system. That is to say, *Muybridge-500* has an interaction which is anti-tactile but it merges the sense of touch with the air gestures without any skin or surface of a solid material.

CHAPTER 5

CONCLUSION

My personal motivation to deal with Media Archaeology and obsolete devices is related to my daily life experience. Before organizing the conference *Play/Pause, FF/Rewind: Shared Practices & Archeologies of Media*, media archaeology was a field that I physically dealt with through the construction of a lab. My knowledge on Media Archaeology field was constructed practice based, and I learned the physical features of the obsolete devices and the obsolete cables by this practice based education. The devices that I and my other colleagues dealt with were all obsolete but running ones like videocassette players and recorders, time-based correctors, patch boxes, video capture cards, tape recorders, etc… With all these devices, I practiced their intended usages, mode of operations and knowledge. Especially for every obsolete, archival material and device, I experienced their particular knowledge and their relation to each other. The media thought me the perspective of looking at their temporal and usage contexts. Media Archaeology as a "tinkering" tool, provided me to acquire knowledge on it and the conference introduced me with

Media Archaeology as a theoretical field. The speeches in the conference which constructed the foundation of this thesis, led me to do this work and create my MFA project.

Tinkering the whole Media Archaeology Lab and gaining a beginner's perspective of the theoretical part of Media Archaeology field with the conference, gave me the opportunity to look at this physical space and the devices from a different context. Especially, *Sony PVE-500* as an *edit control unit*, has a specific usage area and a mode of operation as the other *edit control units.* There are reason that I specifically chose this device to transfer its knowledge or transform the mode of operation of it instead of the other obsolete ones. It was one the devices which grabbed the attention of the conference members among other devices with its playfulness, I also have childhood memories of using this devices. This attraction led me to merge the obsolete jog-shuttle with a motion sensor which is directly related to the control technologies in the contemporary era.

The reason that I used Media Archaeology as a the foundation of the project and the research is to demonstrate the timeless feature of media technologies. In consumer culture, we waste all the materials and tools with the technological improvements. We buy a new phone, a computer without waiting the older one's obsolescence. The new ones according to their temporality, are always attractive. The process of wasting in technological field creates an obsolete sphere which consists of older but working devices. Even the process in our daily lives, in the professional field with professional equipments such as cameras, editing control units, we throw the old

ones away. Jussi Parikka and Garnet Hertz explain the waste process as: “the logic of new media does not mean only the replacement of old media by new media, but that digital culture is programmed with the assumption and expectation of a short-term forthcoming obsolescence.” (Hertz & Parikka, 2012) Taking an opposite position to the replacement as a tool of new media reflects the perspective of this project and thesis. Further, each knowledge belonging to media technologies are belonging to the obsolete media technologies are unique. This uniqueness of the tools, materials, archives, devices lead to the perspective of breaking the order between the notions of the “new” and the “old” from a temporal perspective. Examining the past new media in a contemporary culture ignores the chronological perspective of media technologies. That is to say, Media Archaeology as a tool and a way of seeing, can investigate contemporary, new and unique technologies by transferring the unique knowledge of the past new technologies with a timeless perspective and it can give birth to new contexts. Furthermore, it provides to construction of new knowledge from the merging the knowledge from past new technologies with contemporary technologies and it attributes to the field by acting as an innovative to envision the future.

As an innovative project, yet also inspired from the past, *Muybridge-500*, is a particular way of examining the timelessness of media technologies. The project consists of the transferring the knowledge of obsolete jog-shuttle which belongs to *Sony PVE-500* to another medium and surface. In the project, the mode of operation of obsolete and analog jog-shuttle is investigated by resurfacing digitally to resurrect the device. The merging or the transference of knowledge from analog to digital

supports the timeless perspective of the media technologies. Jog-shuttle in digital mode of operation as a "zombie media device", is a knowledge and mode of operation that can be adapted to the contemporary world. In digital world, especially in the editing field like digital non-linear editing through computer, decision making is provided by clicking with a mouse which is a minimal action of the human body. In the digital culture, the operation of jog-shuttle is overcomed by clicking, *Muybridge-500* exemplifies that the decision making is an active bodily movement through eye-hand coordination. The operation itself become an eye-hand coordination which allows its users to control which is seen on the screen with their hands. This kind of eye-hand coordination relates the operation as decision making and "time traveling" with the human body. Furthermore, in this form of mode of operation, jog-shuttle as a search dial became closer to the essential human gestures as searching by hand as an example of eye-hand coordination. Even we use search operations in our daily lives on the screen of the mobile phones or by touch-bars by using minimal hand gestures, this way of searching became the part of the body, almost an extension. On the other hand, this active body movement as hand gestures, thanks to the 3D space of *Leap Motion*, can be realized in a non-linear environment. These gestures differ from the obsolete devices as discrete mechanical operations changed into fluent operations. It tries to answer the question for its creator and users. "What if we put jog-shuttle in a digital mode of operation within an artwork extracting from the editing field to daily life context without forgetting the past new mode of operation in the editing field?". On the other hand, *Muybridge-500* is a way of testing movements which is quite important in the editing field to follow the continuity with the help and inspiration of Eadward Muybridge's *Animals in Motion*.

The user becomes an active controller of the subject's movement on the screen with his/her bodily action through the usage of gestures. Furthermore, as an interactive installation, *Muybridge-500* takes the jog-shuttle from the dark rooms that are placed in the basement of production houses to an exhibition hall. That is to say, we can say that the jog-shuttle as a mode of operation becomes the interaction tool for an artwork. *Muybridge-500* adds the mode of operation of jog-shuttle's "playing" feature in the context of on exhibition venue. As an interactive installation, even dexterity is needed to control it, it offers its users a strong relation of interactivity with a touchless operation by rejecting the idea of "interactivity should be constructed by tactility".

Muybridge-500 demonstrates that although the technology offers new mode of operations the previous ones are still used. As Jussi Parikka (2012) mentioned, the mode of operation is remediated, resurfaced, found in new uses, in different contexts and adaptation." (Parikka, 2012)

Jog-shuttle in its new mode of operation can be expanded in different contexts if it will be technically developed. From an innovative perspective, the new and contemporary mode of operation can be implemented on the editing field as a tool. In today's editing technology, editors are still using tactile knobs, keyboards and mouses. This project offers using the timeline traveling and decision making by using small gestures to control huge screens. The editing process can become more bodily oriented and the decisions which are sensible to the body will change according to it. Furthermore, if the mode of operation is expanded with other

gestures or with the established gestures for editing field such as: cut, layering, increasing and decreasing the adjustments, new mode of operation which comes with jog-shuttle can be examined as an editing tool, which allows the editor to do everything through the bodily actions with hand gestures. On the other hand, "searching" as a new mode of operation, can be adapted to any kind of database with human-computer interaction. People can use the features of jog-shuttle in any kind of digital interactive data flow by using hand gestures. Furthermore, the new mode of operation can be adapted by the feature of motion sensors in a 3D space. Because of the technical and temporal limitations, *Muybridge-500* works with a 2D controllable screen. *Leap Motion* made possible to work with 3D screen and it receives hand tracking data in 3D. In the editing field, working on 3D screen rather than 2D, can allow the editor to cut in different manners. For example for the gaming field, the editor of the game can cut in different cameras by using hand gestures during the production of the game. For the film editing field, the new jog-shuttle can help to navigate or search in clips or effects to put the timeline. To sum up, before the brain-computer interaction technologies spread, the middle technology as gestural control can be the pioneer of editing or another searching, decision making field.

The whole project making and writing the thesis process opened to me new perspectives. At first, writing the thesis demonstrated me how to conceptualize my daily life experience as communicating the past new devices with each other and working with obsolete technologies. Media Archeological gaze contributed me to look this devices from more timeless and future oriented point of view by concerning historical context as an opposition to the consumer culture. Furthermore, the gesture

based communication and gestures are shaping our behaviors. I personally realized the importance of gesture in any kind of interaction and we are acting with our gestures while we are interacting with something like computers, tools, devices, etc… The gestures that we made shape our thinking and the operations that we make. On the other hand, the quite important point that I realized at the beginning of the project, is recalling an obsolete device shouldn't necessarily take place physically. While I was stuck to plug *Sony PVE-500* to the computer, the idea of mimicking with a motion sensor thought me the merging of knowledge between the contemporary and the past. While mimicking the devices, I experienced the simulation of the circuit by coding. This process was an introduction for me to understand the algorithm of coding. On the other hand, the project with its uniqueness thought me different experiences. Jog-shuttle by using touchless gestures in an exhibition hall, was used with a movement test. People react to the new mode of operation with an attraction to control the screen with bodily action and they directly relate their gesture to the subject's movement on the video. Because of the special placement as lighting, position and size, the new jog shuttle as a mode of operation increased the power of the author (the user) as the conductor of an orchestra in decision making because it gesture as a bodily action instead of merely clicking in contemporary world. In the exhibition hall, after the learning process of usage of gestures, the playfulness of the work was the introduction of the work. The second stage after the introduction was to control the movement and making decisions in bizarre points by stopping the screen. In other words, they searched in the videos to reach the points that they want to see. All these stages applied for four different videos. If I had adapted the jog-shuttle to a tactile surface, the action wouldn't be different from clicking. The touch-bars are the

one of the examples, the mode of operation would be directly controlled with the users finger which doesn't allow to reach the bodily action and decision making. As an another example, if the mouse's mode of operation is transferred to a motion sensor, because of the bodily action, the operation turns into a more concentrated version. In mechanical production, if the user get used to control the robotic technologies with touchless gestures, the sense of touch will be increased in mode of operation. On the other hand, following the perspective of *Muybridge-500*, the user can control multiple devices on video towers (the rack system which consists of different devices of video playing, recording, monitors,etc..) by using the hand gestures without touching any of them. The whole says that gestural control can be the newest and innovative way in human-machine, human-computer interaction.

To sum up, This thesis was written on the media archaeology field in both a theoretical and a practice based way. *Muybridge-500* is the first project that I dealt with the past new media devices in contemporary field. As it is mentioned above, the new jog-shuttle can be implemented directly on the editing operations. The further researches will be conducted to understand the media archaeology and its perspective in a deeper sense. The first further projects will follow the route of *Muybridge-500's* conceptualization as recalling other obsolete media devices such as computers, curcuits, etc…Furthermore, this vision can be expanded by the other obsolete devices which are originated from other fields to transfer their knowledge in media devices. On the other hand, even *Muybridge-500* is a daily life experience based on film editing field, the further projects can be originated from daily life media devices

rather than professional broadcasting equipments, directly related to people's daily lives from an innovative perspective.

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