Summary

INTRODUCTION

I used the opportunity offered by this short part of the text to make some brief clarifications on the reasons that were behind my decision to start and continue, until it's completion, this research.

In the introduction I lay the foundations of the structure on which I tried to build the thesis, the details and the other parts, which now compose it, being imposed, insufflated or arising out of the context presented in each individual chapter.

In this introductory part I mostly make references to the situation of the sculptural representation in the contemporary context and offer three-dimensional holography as a vital and necessary part of an aesthetic ostensive evolution for the artwork imagery, thus becoming, through exposure, an artwork in step with it's time of presentation and representation. I also present the dilemma, which I consider governs the contemporary era. Namely, that it makes a transmutation between the visually analogical space (visually and physically known to the audience of contemporary art) and the virtual one (as a relation of the contemporary man with the new social dimension - cyberspace, augmented reality, social networking, the interpersonal space characterized by an intermediate interface compared to the latter).

CHAPTER I

Using the first chapter I make a formal implementation of the specific terms (known to the public and, of course, to the readers who shall be reading these lines) that I will be using with some recurrency in my approach to the idea of dematerializing the structure out of which contemporary sculpture constitutes itself and still constinues to do so, in an apparent attempt (unjustified - I say) to remain in the same positions from which the direction that I and others like me propose does not ask it to abandon, but instead, to adapt them to the contemporary.

In this chapter I speak about the idea of the *body* as an image, an ideational -

philosophical representation, social and artistic from the perspective of the art history (and others) so far.

CHAPTER II

I've used the second chapter to clarify another important term to which I will be refering to throughout the thesis and to which I refer to as a barometer or a compass. The term in question is that of *space*. Specifically the "idea of *space*" as I titled, suggestively, this chapter.

Like in the first chapter, as in the third, I've made a short historycal and philosophycal excursus of one of the ideas underlying the cognitive perception of a work of art, even more so of a ronde-bosse sculpture. I reffer here to the idea of *space* as a way of perceiving reality through history and especially through the arts. Reporting to this more than used term in the artistic space I am able to serve it as a so called 'starting point' and standard in the perception (in space) of a three-dimensional holographic volume that fills that space with it's presence, but it's representation, in that same space, does not include a physical or tangible form.

CHAPTER III

On the same note I'm using the third chapter to make a historical - philosophical presentation of the perception of space and corporality through the Linear Perspective, as a way of transforming the three-dimensional space,, in which a person resides in a two-dimensional representation on a stand or on a range of media characterized by structural flatness. This ofcourse is a direct reference to the plastic three-dimensional space represented on the two dimensions of the canvas, the paper or the screen.

CHAPTER IV

Continuing in this direction to establish and clarify all the terms, terminology and axiology on which I wanted to build this thesis on, I used the fourth chapter to present the medical and physical principle underlying the perception of space as a three-dimensional one.

This chapter serves on stating the principle of stereoscopic vision as a defining principle of levying a body (of a work of art or not) in three-dimensional space,

perceived as fragments of two-dimensional representation which, but, by juxtaposition and simultaneity of the perceived picture, enables the perception and awareness of a volumetric three-dimensional body in a given space, represented or not, on the basis of perspective, but most certainly perceived as such.

CHAPTER V

The fifth chapter is used to build the main subject of this thesis, namely holography. In this chapter we determine what holography really is, who and when invented it and who are those who have made the defining innovations in this field.

Also in this chapter (as in all the thesis for that matter) I make use of the terms given and explained in the previous chapters to create the big picture on how to approach the main subject – holography (body, physicality, space, spatial representation, representation in perspective, stereoscopic perception and in perspective (of the space and the bodies that perception presents us), etc.).

CHAPTER VI

The sixth chapter is used exclusively to expose and define some of the terms which we require to decipher the text and that I have not covered in the previous chapters.

I am referring to terms such as *hologram; amplitude; coherent light; holographic stereogram; interference pattern; laser; object and reference beam; types of holograms*; and so on. I made this short but detailed presentation of these terms, distinguished from what we normaly use in our every day language, for exactly the same reason I wanted to start the thesis by presenting and explaining, in terms of philosophy and art history, the concepts and principles indispensable to browse and understand this text if he or she who read this paper doesn't already know them. It seems common sense, when presenting the public with a research paper (in the visual arts - I'm aware of that), using unknown terms and words, or who are not currently used by the majority of the public, to make a small referential addition to present and define (for the understanding of all) those new terms.

CHAPTER VII

During the seventh chapter I present, as stated in the title, a brief historical excursus of the artistic environment of holography.

In this chapter I presented in an order, as closely as possible to the truth, the history of this contemporary environment for artistic expression and scientific research in it's various fields of application. This historical journey through the fascinating world of three-dimensional holography I've started it with it's father - Hungarian-born British scientist Dennis Gabor – who, in 1947, invented holography "while working to improve the resolution of an electron microscope." Then I did a survey as detailed as possible of all other researchers who, in turn, have innovated this process and had established processes that led, through multiple trial and failures, to the three-dimensional holography that we know and recognize today. I refer of course to the off-axis recording innovations that Emmett Leith and Juris Upatnieks have succeeded in 1962, and that is still used today as one of the few holographic recording techniques that give good results each and every time. Then point out the successful culmination of the research of Yuri N. Denisyuk, which combined the principles and processes of color photography with holography, which resulted in the existence of reflection holograms, visible in and with white light. After that I refer to T. H. Maimam's innovation of the pulsed ruby laser, thus revolutionizing the entire field of holography, by the fact that from then on they could do holograms of living subjects (holographic portraits).

I also point out innovations by dr. Stephen Benton who is able to present a transmission holograms using just daylight. In this chapter I'm talking about the first holographic art exhibitions, about the establishment of The Museum of Holography in New York; the Holography School founded by Lloyd Cross in 1971; the first holograms made by 'true' visual artists such as Bruce Nauman, Carl Frederick Reutersward and Salvador Dali; the first whole hologram recorded by Lloyd Cross in 1972 and the attempt to make a full holographic film by the soviet researcher Victor Kormar; and so on.

These are just some of the important points that I've mentioned extensively throughout this seventh chapter.

CHAPTER VIII

The eighth chapter I've used to expose - in short, that is true (for those that don't

already know and for those who might be curious to know the processes behind the recording of a hologram) - the principles, the materials and the classical method to make a true hologram. Also in this chapter I present the two main types of holograms: the transmission and the reflection hologram, and the various materials required for the recordind of each.

Besides explaining the types of holograms 'classic' or 'true' I made several references (looking forward to the eleventh chapter) about the pseudo-holograms such as pepper's ghost and holographic projections on curtains of water or smoke.

CHAPTER IX

From the ninth chapter I enter directly into the main topic of the thesis, showing, in an order as faithfull as possible the real timeline, the artists who have created works of art through this new medium of artistic ostension.

To mention only a few of them (although all are very important to the history of arts and especially to that of holography): Bruce Nauman, Carl Frederick Reutersward, Salvador Dali, Dan Schweitzer, Margaret Benyon ("the mother of british holography"), John Kaufman, Ana-Maria Nicholson and Rudie Berkhout.

To each one I assigned a few pages to present their artistic creation in the field of three-dimensional holography and exemplify, in an eloquent manner, their works through more than eloquent images.

CHAPTER X

This chapter, like the previous one, I've used it for the contemporary holographic artists and their work (this time especially for those that really are contemporary or have worked mostly in the contemporary period of this artistic medium).

The arbitrary selection that I've made, both among those in the previous chapter and among those in this one, was to establish the direction for the expression of three-dimensionality in contemporary holography. Of course there are many contemporary holographic artists, masters of their art, with an extraordinary artistic and academic career, but whose presentation did not serve my research, because their holographic representations are either pictorial or graphic, but not one particular to the three-dimensional holographic sculpture.

Among those listed in this chapter I can remind one Inaki Beguiristain, Betsy

Connors, Ikuo Nakamura, Sam Moree, Andrew Pepper, Sally Weber and the phenomenal Ray Park.

CHAPTER XI

The eleventh chapter was devoted exclusively to new discoveries in the field of holography, three-dimensional holographic projection and rendering techniques of the so called pseudo-hologram.

Presented within this chapter are forgotten Victorian theatrical techniques, rediscovered in the present day, suggestively entitled *Pepper's Ghost*, holographic projections on curtains of water or smoke, the 'holographic' images of renowned musical artists that were in this way 'resurrected'.

Also, I used all of this chapter to present contemporary artist Hiro Yamagata's projects; from which I only reffer to the laser design of a statue of Buddha in the Afghanistan province of Bamiyan, destroyed by the Talibans 14 years ago – a project resumed and completed by a Chinese couple in June 2015; the holographic project from the Guggenheim Museum in Bilbao, Spain and the one at the Ace Gallery in New York.

On the same note, I'm making a review of the holographic representation from last year's representation of Edward Snowden's bust in New York through a holographic design on a smoke / ash curtain, and a presentation of the latest findings in the field: the holographic glasses from Microsoft, the two types of tactile and interactive holograms developed by two separate teams of japanese researchers and holographic projection / augmented reality from the **Magic Leap** company in the US.

CHAPTER XII

In the twelfth chapter, and the last one, I've presented some of my personal works in the field of three-dimensional holography that I have successfully done during the perriod of my doctoral studies. Thus, judging thru a practitioners eye, I can say with confidence, that as fascinated this medium is, viewed from the outside inward, it is even more so complex, elaborate and difficult to achieve a coherent (and especially a) three-dimensional holographic image.

Those few holographic works made by me, represented thru photographies in this chapter, are only a small, a very small part of the experiments that I've done durring my research, but which (given that I didn't have access to an state-of-the-art holographic

laboratory and I had to work around and about, making all kind of improvisations on the subject) I was able to present as completed within a defined, consistent and worthy of being presented in a written form, which must be presented publicly. So, I decided to introduce and represent only those few transmission and reflection holograms that I really managed to do as they should be done.

FINAL CONCLUSIONS

The last part of this thesis, the final conclusions (the partial ones being already introduced as a subtle intervention between the ninth and tenth chapters) finds me redefining the space of contemporary visual arts through the space created by holography. Thus, the possible and feasible space of an aesthetic ostension through a three-dimensional hologram or holographic three-dimensional projections (tactile and interactive or only a visible one) becomes a new kind of medium - the material of sculpture and the three-dimensional volumetric expression of contemporary art.

Features storage/ playback, reduce/ enlarge, archiving/ museification, transportability/ handling for an exhibition or protecting works of art of all sizes makes three-dimensional holography a new space for the artistic expression, but also a way to protect all art against the accidental damage (natural or anthropogenic) caused to the worlds heritage. Thus, whatever is the direction chosen by each of us to use this new media in our artistic efforts (or not), the possibilities for holograms and three-dimensional holography are seemingly endless. Through an interdisciplinary participation in the research in this field and others (not necessarily related or similar) an unexpected utility can be reached for holograms and holography and for many other scientific and / or artistic uses that we may or may not known today.