The visual representation of the hologram: a comparative approach to its political and social uses

La representación visual del holograma: una aproximación comparativa a sus usos políticos y sociales

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ABSTRACT

On April 28, 2017, Jean-Luc Mélenchon, a prominent French politician, pioneered a unique way of engaging with multiple groups. While he was in Dijon in person, he simultaneously connected with a Grenoble audience using a hologram. A central focus is the tangible bond between a politician and their listeners. This study starts by analyzing the semiotic cues in photos and videos on official and social platforms. Subsequently, there's a deep dive into the reactions of Grenoble attendees to various forms of expression.

Each method is integral to the total experience. As suggested by Kress and Van Leeuwen (2001), meaning is molded socially via channels like discourse, production, design, intake, and the "textual" backdrop. In Mélenchon's holographic instance, the scope for creative engagement and the idea of heightened modality is evident (highlighted by Andrieu: 2011). Holography offers:

- Voice-driven auditory engagement.
- Observation of physical actions, hand movements, and facial expressions.
- Recognition of visual elements such as clothing, colors, and proportions.
- A three-dimensional display, evoking a feeling of actual presence.
- Interaction with the spoken content, both pre-written and extemporaneous.

This is termed as hypermodal interaction. Designing a tailored hologram in line with the core research question effectively combined theoretical perspectives on holographic interaction. The goal wasn't merely a visual portrayal of the research but to emphasize this visual method, especially in formulating a visual strategy (as put forth by Pink, 2006). This process captures both visuals and sounds for subsequent engagements with holograms. Furthermore, this research seeks to outline and present the aspects of an innovative, immersive, and visually centric research approach.

Keywords: visual representation, hologram, virtuality, interaction, design, media consumption.

RESUMEN

El 28 de abril de 2017 el líder político francés Jean-Luc Mélenchon se presentó ante diferentes audiencias de manera simultánea. Por una parte, se encontraba de forma física en Djon, mientras que en Grenoble (Francia) lo hizo a través de un holograma. Una de las preguntas de investigación más importantes es ¿cuál es la relación corporal entre el líder político y su público? La investigación comienza con la revisión semiótica de material como fotografías

y vídeos en páginas web oficiales o medios sociales. Después intentamos analizar las interacciones de los visitantes del lugar de Grenoble con los modos de expresión.

Todos los modos anteriores son intrínsecos a la experiencia. Kress y Van Leeuwen (2001) consideran que el significado se produce socialmente a través del discurso, la producción, el diseño y el consumo, y el "texto". En el caso del holograma de Mélenchon, el potencial significativo en la imaginación de los visitantes y la hipermodalidad es evidente (Andrieu: 2011), ya que a través de la holografía es posible:

- Percibir el sonido de la voz.
- El movimiento del cuerpo, los gestos, las expresiones faciales.
- Elementos visuales, como la ropa, los colores, la dimensión.
- La imagen en 3D, es decir, la sensación de presencia.
- Y el habla, texto escrito previamente y hablado.

Este proceso es una comunicación hipermodal. Diseñar un nuevo holograma específico en relación con la pregunta de investigación fue un complemento práctico para asociar contenidos teóricos sobre la comunicación holográfica. Esta decisión no es para ilustrar la investigación sino para incluir esta producción visual, principalmente, en el desarrollo de una metodología visual (Pink: 2006) filmando imágenes y sonidos para próximas situaciones de interacción con hologramas. Esta investigación es también para pensar y presentar las características de una metodología innovadora, interactiva y visual.

Palabras clave: representación visual, holograma, virtualidad, interacción, diseño, consumo de medios.

A REVIEW OF THE HOLOGRAM DEVELOPMENT

To understand what a hologram is its necessary to determinate the fundamental image importance as a representation element of the reality, either a traditional painting or a digital photography. Nowadays, the societies are surrounded by audiovisual content everywhere: tv, advertisement, web sites, apps, and in social networks it reproduces faster than we could imagine.

The image world can be named the *boost world*. The easy access to the new media lets the audience consume a lot of multimedia products and, despite this quantity of information, they feel isn't enough and they are constantly looking for more and new kind of content. The image has been suffering changes through the exit and access platforms, for example, the two-dimensional (x,y) of the paintings or the photography, support and enable the analogic cinema movement, and then it transformation to digital versions. The new developments around multimedia try to catch all the audience senses, and maybe this is the

main challenge to involve and be spectators' part of the pieces. Although the technological advances, the perceptions are limited.

Innovative technology helps to the construction of the images, gives another perspective of what we see, and how we can appreciate them. In this case, the hologram is a specific example about new ways to represent the reality and change the perceptions. This technology was created in 1924 by Dennis Gabor, Physics Nobel Prize winner in 1971. He was trying to improve the resolution of the electronic microscope, then developed a circular diapositive where can map the name of three important scientists for him; he named holography, from the Greek: *holos*, means *all*. The invention mixed resources like photography, the use of the light to product the projection; in this moment discovery didn't matter, but when the laser arrived, other uses.

On the other hand, as Wilber (1982) points out, three decades ago there were already several studies all around the world that have demonstrated that our brain structures see, hear, smell, taste and feel in many ways using mathematical processes to decode the information. It is not our interest here to go deep on this models or studies and much less in the field of mathematics or neuroscience, although there's also some space here to mention a philosophical point of view for this. According to Pribram (1997) images are mental constructions, they are born of processes in which the brain (object) is involved and the senses (objects) in their Interactions with the environment (considering this last one objectively in terms of matter). Therefore, images (an aspect of the mind) are things that born in an objective philosophical formulation, objectifying.

In any case we need to set up the multi factorial and interdisciplinary scenario where image (holography and holograms) take place these days, considering sources of information (inputs) and responses of the spectators or audience (outputs) through the communicative process.

Holography reveals a different relationship between perception and image. While the two-dimensional image (screen, photo, painting) limits the sensation of depth and the amount of information about the object represented or recorded, the hologram in its three-dimensional effort (x, y, z), shows different "points of view" and access to what is observed.[1] It is true that there are efforts to replicate three-dimensionality in outputs or interfaces that remain two-dimensional, such is the case of stereoscopy. Cinema, for example, has created new narratives based on super planes and an audiovisual language designed for this type of resources, and although it is true that it gives us a certain feeling of realism,

1 We refer to "the observed" with the eagerness to contemplate a broad spectrum of what the content of the hologram can become.

stereoscopic consumption still "ties" the viewer to a single plane, to the position of his seat in the cinema. The hologram gains ground in this feeling of realism by allowing the viewer to inspect the object, what is shown, what is represented, from different points of view. The viewer can observe the contents of the hologram in such a way that each position from which he or she observes adds new information about what is being observed. In other words, not only is a certain realism perceived in what is observed,[2] but more information about what is observed is accessed.

With these capacities, the holographic technology and specifically the hologram, is shown as a tool that stimulates the spectator, stimulates his capacity of attention and amazement. The spectator knows beforehand that the image is not real, however the sensations of "volumetric" presence capture his attention as if the observed thing were present. In this sense, we are approaching a new way of appropriating reality, a new panorama of the way we know through the observed. However, the spectator's sensations and perceptions have the possibility of being rearranged, of reinventing themselves, as has been the case with artistic representations in the digital world. While it is true that some sensory capacities stimulated by classical representations such as painting fade away in the face of digitalization, it is also true that other sensory capacities are stimulated:

> The usual criticism against digital representation is that it loses the tactile quality of pictorial representation and is thus less organic and intimate (digital representation is supposed to be more intellectually and emotionally remote than pictorial representation). However, the intensification of the optical quality implied by digitization more than compensates for the loss of the tactile dimension), especially since the digitized sensation is in constant optical motion, which generates intimacy and intensity (Kuspit, 2006).

Said shortly, hologram provides an active position for spectator, not only visually but related to full perception and imagination (Kuspit, 2006).

It is necessary then to point out the relevance or some other disciplines like Sensory Anthropology (Pink, 2010) to understand many innovative uses of interfaces and image techniques that reach us to recreate representation and communication processes that, perhaps, ten years ago it would have been just science fiction ideas. This" new" ways to represent and recreate messages (holograms) could be a natural source for visual methodologies to research. The hologram becomes important in this sense of realism not about the quality of representation but by allowing the viewer to inspect the object, the represented, from several points of view. The viewer can observe the contents of the hologram in such a way that several angles

2 The intention is not to speak of objects or subjects in the image, but of contents, hence we refer to these contents as "the observed".

from which he observes adds new information about what is observed. In other words, not only is a certain realism perceived in the observed, but access to more information about what is observed in a more "natural" way.

Last, but not least, the intensity with which the "realistic" representation of the contents is pursued remains to be resolved, a fact that could be determined by the construction of the message and the ultimate purpose of the use of the hologram, as in the case of the French politician Jean-Luc Mélenchon. In this case, it would not only be necessary to analyze the capacity of holographic representation, but also the symbolism of its "appearance" in seven different places at the same time. The virtualization of the person can contribute to the creation of symbolisms of power, of omnipresence sponsored by virtuality. Since holograms are a special, advanced form of photograph; technically and symbolically speaking, any portion of a hologram includes the entire image, because of its ability tube project into an "empty" space. Besides, holograms flicker, buzz, and fluctuate and even so, the perception of realistic could be stronger than a bi-dimensional canvas because holograms can be walked around and viewed from almost any angle, just like the way we do with a real object.

Having reviewed the current possibilities of the hologram as a technology, we will address in the following sections a proposal for its use as a tool for visual methods and its potential for the creation of high-impact content that allows us to understand the audiences and their corporeal relationship with the way in which the content is displayed, i.e., the hologram.

THE REVIEW OF THE USMB APPROACH TO CREATION OF THE HOLOGRAPHIC PROPOSALS

For the past two years, as part of the master's in digital creation at the University of Savoie Mont-Blanc, we have been working on technical approaches for the creation of small holograms with digital 3D modeling tools and traditional video. The realization has been a purely experimental stage by the students of the program in the subject of Sensory Anthropology.

The process has involved the creation of a visual narrative with the aim of obtaining subsequent information from those who observe the hologram. In this sense, two stages of the project have been proposed and are described below:

1. ***Determination of the creation technology*****:**

The students were instructed in relation to the concepts of perception, sensorially and the notion of presence, as indicated at the beginning. Attention was also drawn to the complexity

of the production elements, considering the example of the hologram used by Jean-Luc Mélenchon in 2017, where the movement, the "naturalness" of the speaker, the surround sound and of course the quality of the speech used, which reinforces the notion of presence, were analyzed. With this as a starting point, the students conducted an analysis of their technological capabilities and two types of products were established, those that would have content made in 3D digital modeling software (Maya or Blender) and those directly made with video in an environment that favors the content. The hologram output was implemented with the students' mobile devices and a holographic projector created by the students based on acrylic.

2. *Creation of the narrative approach*:

Once the formal element for the resolution of the hologram was covered, the students were asked to create the script for the content, with special emphasis on the relationship of the visual and the auditory. Although it is true that we considered the visual part as the most important because of the novelty of the way of presenting the content, the auditory part was important since, for the purposes of the master, the contents were brief and had to be able to capture the attention.

After the implementation of the products, we proceeded to collect qualitative data by means of brief surveys among those who observed the holograms, some of the findings were the following:

a. **The volumetric sensation is the first appreciation of the holographic products**. Although they are the result of the indirect projection of a two-dimensional screen (at least in this version of the hologram that was created), the sensation of volume and three-dimensionality is striking. It is true that there is no interaction interface with the content, at least not in a direct way, however, those who visualized the images tried to surround the holographic projector in several occasions with the intention of perceiving different points of view of the image.
b. **The perception that the object floats**. It is true that care was taken that the production of the content could consider black backgrounds and that both the three-dimensional objects and the live action videos had the peculiarity of being located in the center, however, this technical requirement resulted in the sensation that the object floats in the middle of nowhere.
c. **The sensation of presence**. The observers stated that the holographic representations gave them the sensation of objects being present and not necessarily virtual representations. One of the most important notions that we have handled is

the notion of presence. Apparently, the novelty of the hologram lies very much in its format and this sensation of presence from which it can be deduced that an object "is", virtually speaking.

d. **The need for a controlled environment in terms of light**. It could be observed that the hologram was better perceived when light conditions were under control, particularly with a dark background or low light. This may be due to the technology that was implemented to be able to generate the hologram projection but should always be considered when working with the holographic resource.
e. **The holographic method matters**. There are nobler output systems such as the holographic mesh projection that allow to obtain better results when making the projection than the holographic pyramid, especially considering the light condition, however for the purposes of this research, the holographic pyramid was a resource of easy access and creation for the tests.

In summary, we could dare to say that the innovative aspect of the hologram is in the perception it provokes in the observer. In other words, although the observer is aware that the visualized contents are a three-dimensional virtualization, either in modeled form or a video capture of live action, the result and the way in which this is presented does not fail to cause a certain level of astonishment among those who observe the content. This could be due to the 360 effect of the object which, as mentioned above, is related to the object's volume, the space it apparently occupies and the perception of it.

VISUAL METHODS AND VISUAL AND INTERACTIVE RESULTS

We have combined different methods. These methods had been experimented in other research (Ibanez Bueno, Chabert, Lamboux-Durand, Wanono,2017), Sociology of uses (De Certeau, 1, 980), visual (Pink, 2003) and hypermedia anthropology (Da Silva Ribeiro, Bairon, 2007) and phenomenology (Weissberg, 1999) were used and combined in order to understand the practices of the hologram and to build a sense-making methodology.

In the tradition of visual anthropology, there is an association between digital art, with its use of images and screens, and the social sciences, which use visual methods in a participatory approach.

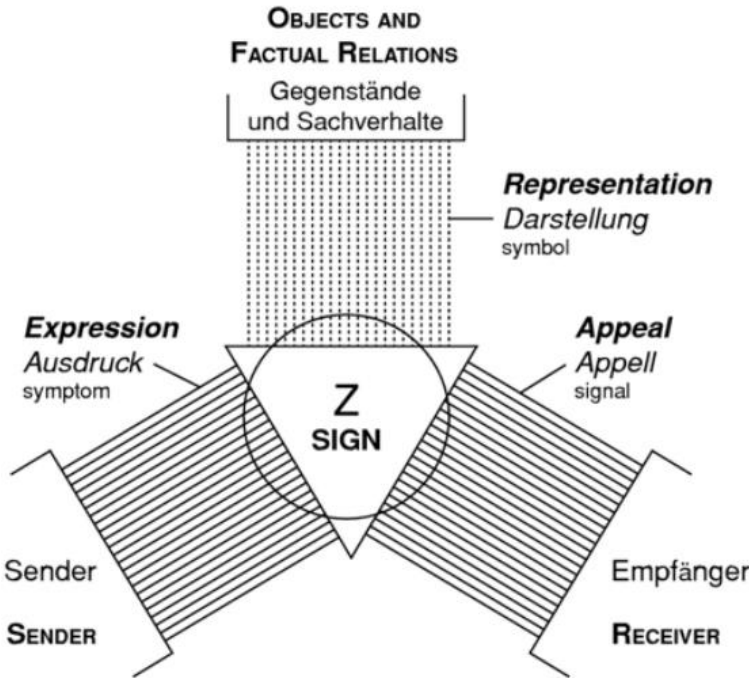
The synergies between digital art and anthropology reinforce a shared and often daring way of questioning the world.

Documentary film and research documentaries, like photography, have evolved with the almost universal use of digital technology. New formats have emerged in the audio-visual arts. For a better understanding, Jacobo Sucari proposes a classification of contemporary documentary (2012) that goes beyond the usual categories of "traditional film documentary" and "video documentary": documentary in a contemporary art process; augmented documentary; transmedia documentary; web documentary. This classification, which must be enriched by recent technologies, helps us understand why the social sciences must also experiment with new digital and interactive formats.

The Editorial-Manifesto "Exploring new digital experiences by fully exploiting the opportunities offered by online publishing" (Bouldoires, Reix, 2017, 2018) encourages researchers in this sense to propose new visual and digital methods, which further justifies the choice of a research hologram.

The aim of this research hologram is to answer this central research question: how can the body be moved when a hologram is used? In Figure 1, the model of Bühler (1934) help us to analyze the produced signs by the holograms.

FIGURE 1. BÜHLER MODEL



SOURCE: BÜHLER'S ORGANON-MODEL (BÜHLER, 1934).

The researchers presented the students[3] with the following goals:

1. Understand the main dimensions of the body.
2. Learn how to interpret the bodily relation between iconic content of a media and spectator of the media.
3. Learn how to use visual methods (In the tradition of visual anthropology) to report on social research.
4. Apply visual methods to the case of the use of visual media.

This was followed by presentations by the same researchers on the following topics before an exercise for the students:

1. Body: biologic; cultural construction; object of mediation.
2. Body in front of Iconic media.
3. Principles of Visual and Hypermedia Anthropology.
4. Each student will be required to collect images and texts and take images with a camera.

After these steps, the final work is specified:

Ideas

To create a hologram content during the class to show it in a little hologram projector

3D model
Audio
Message

Working during the classes

Discuss some ideas on the video.

Set time to create the 3D Model (people that use Blender or any other software for 3D modeling different from Maya, feel free to begin the model, and possibility to disconnect).

Download Autodesk Maya from Maya Website.

Days 01, 02, 03

Working on the 3D model and the turntable animation.

3 Master 2d students: Abbad Gaël; Ballerino Antoine; Chapuis Martin; Ducrettet Nicolas; Emery Jordan; Le Coarer Gaëtan; Pochat Morgane; Chiarelli Luiza and Gallegos Ambar (Phd Student).

Set the composition on *Premiere* or any other software for video editing show our final model on the hologram projector.

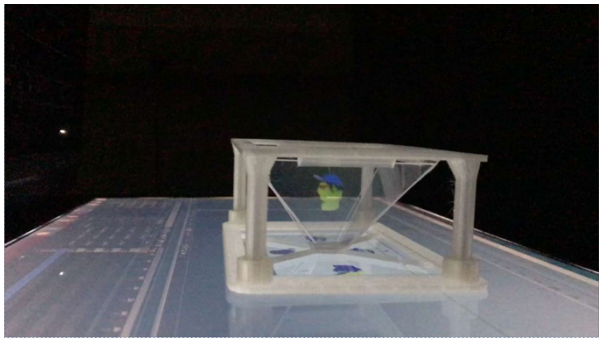
It was an opportunity to answer to the research questions in the relation to creation of the narrative approach and new social uses of holographic communication.

Holographic results in Images 1-4 and online:

IMAGE 1 HOLOGRAM 1 (2D REPRESENTATION IN INTERNET)

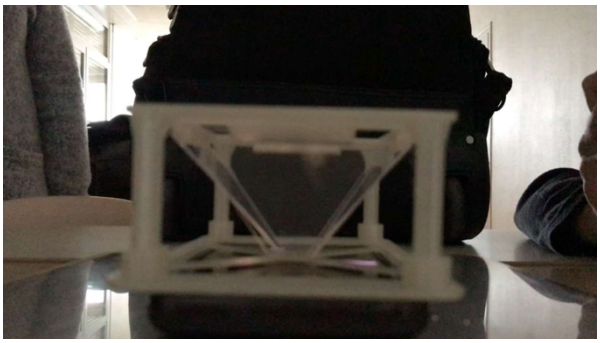
SOURCE: https://version2022.visualdistance.com/politicalhologram.html

IMAGE 2. HOLOGRAM 2 (2D REPRESENTATION IN INTERNET)



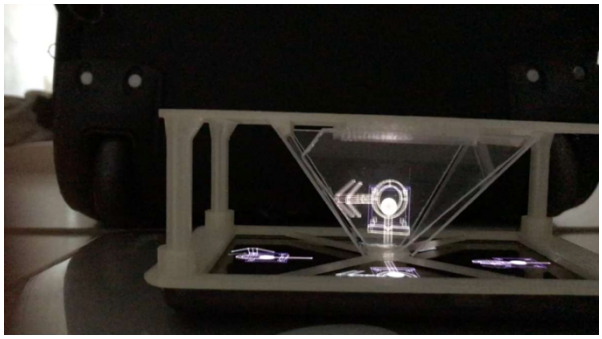
SOURCE: https://version2022.visualdistance.com/politicalhologram.html

Image 3 Hologram 3 (2D representation in Internet)



Source: https://version2022.visualdistance.com/politicalhologram.html

Image 4. Hologram 4 (2D representation in Internet)



Source: https://version2022.visualdistance.com/politicalhologram.html

CONCLUSION

The results of this research are presented not only in the traditional written form used at scientific conferences, but also in interactive form. A more complex production has been developed in the form of holographic and physical manipulation. A website has also been created, although this version offers only a two-dimensional representation. Following on from this version, although modest in comparison with a professional hologram due to the purchase on Amazon of a simple device for six euros with the addition of a cell phone, the research hologram requires manipulation of the device for access to informational elements,

involving the user through interactive corporality. At the very least, the user must experience a certain number of physical sensations. This bodily experience is linked to the results of this research into the corporeal dimension of the hologram. The superposition of informational and usage modalities seems to us to be very rich in terms of transmission and assimilation of research content.

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