

ARTISTIC HOLOGRAPHY AS A TYPOLOGY BELONGING TO THE VIRTUALLY THREE- DIMENSIONAL ARTS

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- The use of images by the humankind to illustrate abstract thoughts and physical perceptions of the world around him can be traced back to prehistoric times, however recording a specific moment in time, a series of actions during a certain time-frame and the image's movement itself have been the main difficulties since then until the 19th century;
- Later on the 19th century innovations in image recording technologies (mainly photography and film) helped to surpass such difficulties;
- Based on previous knowledge about stereopsis and its relationship with depth perception and representation on bi-dimensional surfaces contributed to the production first forms of three-dimensional photography and three-dimensional films;

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Great Hall of the Bulls, c.17,000 B.C.,
Lascaux, France



Standard of Ur, c. 2500 B.C., shells, limestone and
lapis lazuli, wood and tar, British Museum, London,
United Kingdom



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Interior of Publius Fannius Synistor
villa, c. 50-40 B.C., Boscoreale, Italy



Michelangelo, *The Last Judgement*, 1535-1541,
fresco, 1370 x 1200 cm, Sistine Chapel, Vatican
City, Vatican



ARTISTIC HOLOGRAPHY AS A TYPOLOGY BELONGING TO THE VIRTUALLY THREE-DIMENSIONAL ARTS

- * By the middle of the 20th century, several technological developments and scientific discoveries started to be used in the production of artworks, including holography in late 1960's, being all grouped as the New Media Arts;
- * Within the New Media Arts I found appropriated to gather the three-dimensional image representation typologies in their own specific subcategory which I called the Virtually Three-dimensional Arts, where I place holography along with 3D and stereoscopic photography, 3D and stereoscopic film, and stereoscopic Virtual Reality;

Virtually Three-dimensional Arts

- * Characteristics of the Virtually Three-dimensional Arts:
 - * The space where the three-dimensional scene occurs exists within two spatial boxes: one in the posterior part of the recording surface plane and other in the anterior part of the recording surface plane;
 - * The three-dimensional scene can have a certain degree of "autonomy" from the recording surface in terms of representation;
 - * The ability to record on the same recording/displaying surface two or more images of the same scene;

Virtually Three-dimensional Arts

- * The two spatial boxes where the 3D scene occurs also have a different impact on the observer:
 - * The spatial box in the posterior part of the plane where the recording surface is situated, is the one which the observer is more used to (it's frequently seen on paintings, bi-dimensional photographs, drawings, etc.);
 - * The spatial box in the anterior part of the plane where the recording surface is situated causes more surprise to the observer as he isn't so used to see image representations on that spatial box;
- * The positioning of the scene within these spatial boxes doesn't affect its three-dimensionality in the eyes of the observer, reinforcing the sensation of virtual physicality of the scene;

Virtually Three-dimensional Arts

- * The “autonomy” that the depicted scene has from the recording surface is dependent of the artist’s will:
 - * It may be included as key element in the dialog established with the observer;
 - * It may be have the secondary role on the dialog between the observer and the artwork of simply be the medium on which the scene was recorded without any influence on the dialog besides the one the typology itself has;

Virtually Three-dimensional Arts

Edwina Orr, *Sketches*, 1981, animated reflection hologram with white light transmission variants, 10 x 12.5 cm, Johnathan Ross Collection, London, United Kingdom



Howard Gerry, *Reach*, 1989-1990, mixed media and reflection hologram



Virtually Three-dimensional Arts

- * The “autonomy” of the scene from the recording surface is dependent on the ability to record two or more images on the same place so that it could be perceived three-dimensionally by the observer as it would with a physical three-dimensional object;
- * Almost every typologies within this group require some kind of auxiliary glasses in order to arrange both bi-dimensional images to achieve this effect;
- * Holography is the only one that doesn't need any sort of apparatus to achieve this effect;

Virtually Three-dimensional Arts

Observers of a 3D film using polarized glasses to see the three-dimensional images



Lloyd Cross, *The Kiss II*, 1974, multiplex hologram over film, 12 x 23 cm. MIT Museum Collection, Cambridge, Massachusetts, United States of America



The Differences of Artistic Holography as a Virtually Three-dimensional Art

- * The absence of visual auxiliaries in order to see the 3D images gave additional freedom to the artists at numerous levels:
 - * Exhibition freedom (possibility of both indoors and outdoors artwork exhibition);
 - * Increased interactivity with the artwork's surrounding space;
 - * Increased interactivity with other artistic typologies;
 - * Increased interactivity with the observer;
- * This makes artistic holography the most articulated typology of the Virtually Three-dimensional Arts;

The Differences of Artistic Holography as a Virtually Three-dimensional Art

- * This interactivity with the surrounding space of the artwork can be seen in Isabel Azevedo's and Elizabeth Sanford-Richardson's *Lotus* (2013), where pictorial elements occupy a significant space in both anterior and posterior spatial boxes, to the extent of giving the impression of invading the observer's physical space;
- * Interaction between typologies can be observed in artworks such as Setsuko Ishii's *Encounter II* (1979), where sculpture and holography complete each other to create a three-dimensional artwork that operates at both physical and virtual levels;
- * *Encounter II* (1979) is exhibited outdoors, being a good example of how the before mentioned characteristics can be combined in one piece of art;

The Differences of Artistic Holography as a Virtually Three-dimensional Art

Isabel Azevedo and Elizabeth Sandford-Richardson, *Lotus*,
2013, digital reflection hologram, 60 cm x 45 cm, Johnathan
Ross Collection, London, United Kingdom



Setuko Ichi, *Encounter II*, 1979, white light transmission
hologram, sculpture, metallic structure and mirror, 30 x 375 x
410 cm, Hakone Open-air Museum, Hakone, Japan



The Differences of Artistic Holography as a Virtually Three-dimensional Art

- * Some artistic holography's specificities need to be met in order to see the depicted image, which brought a series of drawbacks, but these soon became key plastic values endemic to this typology and helped to establish a unique form of interaction between the holographic artwork and the observer:
 - * Specific illumination;
 - * Restricted view angle;
 - * Recording multiple perspectives of a given still image;

The Differences of Artistic Holography as a Virtually Three-dimensional Art

- * Specific illumination:
 - * On one hand, the specific illumination requirements to see the recorded image brought a setback to the popularity of holography in comparison to other three-dimensional typologies of the same era;
 - * On other hand, it became a useful plastic value for artistic expression purposes, as it gives control the artist over the artwork's behaviour by controlling it's illumination (also applies to multicolour transmission and reflexion holograms);
 - * This characteristic allowed the creation of interactive installations using ultrasound sensors to turn on and of the lights needed to reconstruct the holographic images present in it;

The Differences of Artistic Holography as a Virtually Three-dimensional Art

Philippe Boissonnet, *In Between*, 1997, multicolour transmission hologram, ultrasound sensors, microcontroller. La Fabrique, Université Laval, Québec, Canada



The Differences of Artistic Holography as a Virtually Three-dimensional Art

- Restricted view angle:
 - Initially the restricted view angle of the holographic scene appeared to be a drawback, as when compared to other 3D typologies, as holography along with 3D Virtual Reality are the only ones having it;
 - It also became a plastic value as it allowed the artist to dictate what is seen in the holographic space depending on the observer's position, thus accentuating the interactivity feature of holography (both to pass from seeing the dark blur when out of the view angle and to see the multiple elements within the holographic scene when in side the view angle);
 - It makes the hologram's reading bidirectional and it's speed is dependent of the observer's will, even when placed on gyratory surfaces the observer can freely counter that movement and the hologram will still make sense (this feature is unique to holography within this group of arts);

The Differences of Artistic Holography as a Virtually Three-dimensional Art

Dean Randazzo, *Rembrandt*, 1991, white light transmission hologram, 13,75 x 18,13 cm, Johnathan Ross Collection, London, United Kingdom



Lloyd Cross, *The Kiss II*, 1976, multiplex hologram on film, 12 x 23 cm, MIT Museum Collection, Cambridge, Massachusetts, United States of America



The Differences of Artistic Holography as a Virtually Three-dimensional Art

- * Recording multiple perspectives of a given still image:
 - * It allows/invites the observer to freely explore the multiple perspectives of a specific still image scene as it would in the physically three-dimensional space;
 - * This feature, combined with the observer's freedom of exploration of the holographic scene, made this typology the chosen by poets to break from bi-dimensional plane of the written words to give a third dimension to their poems, by playing with the position of each word's letters in virtual space in order to create different words that appear as the observer explore the holographic space of the holopoem;
 - * This sort of three-dimensional poetry only exists in holography as it offers most freedom for a given still image;

The Differences of Artistic Holography as a Virtually Three-dimensional Art

Eduardo Kac, *Holo-Olho*, 1983, reflexion hologram, wood and acrylic, 25 x 30cm,
Essex Collection of Art from Latin America, University of Essex, United Kingdom

