The future of holographic technologies and their use by artists

S Oliveira¹ and M Richardson²,
¹ Student, De Montfort University, UK, The Imaging & Display Research Group. Leicester LE1 9BH
² Professor, De Montfort University, UK, The Imaging & Display Research Group. Leicester LE1 9BH

Abstract. The use of holographic technologies in the past has faced resistance in the artistic field. The most conservative artists and critiques saw the term “holographic” more as a technical subject than an artistic one. Nevertheless, to explore new forms to create art has been a constant challenge for any artist, whatever their field. At the end of the 20-century the concept that art can explore any field or subject, create a vision that is somehow technological, is part of the evolving artistic world. In the last two decades, in the search for new terminologies, scientists and artists have used the expression “Holographic” as a synonym of evolution, but with different meanings. Artists are using it as a new form of art call “Holo Art”; scientists see it as a “new” science technique where light takes an important part in the process, and can be used in various aspects of daily life, such as, security and medicine. This paper will explore artists who take the challenge of combining their art with new technologies and how they are viewed in a world where the question of ‘what is and what isn’t art’ is very debatable. Other questions that will be explored are ‘How can these techniques be useful to artists?’ and ‘How do artists challenge themselves to analyse the pros and cons of the results that can be obtained?’

Key-words: Holographic Technologies, Artistic Field, Holographic, Holo Art, Artists

Introduction

Artists embrace the world that surrounds them in their attempt to explore the different aspects and situations that they are involved in, whether voluntary or involuntary. As a form of expression the use of different techniques became paramount for creativity; taking the artists to a different level of interpretation, of their understanding and view about conscious and unconscious challenges, that appear in the process of communication.

For centuries, the attempt to transmit and represent concepts and belief in all areas of expertise, in original and unique ways, has been systematic. For example, when debating how scientists and artists contribute to knowledge enhancement, the argument inevitably results in the question of how much collaboration is seen has essential or desirable. The scientist seeks clarification and support so the sharing of research into using holographic techniques is necessary so that studies may be replicated and scientific expertise supported and developed. Conversely the artists does not seek such affirmation; they see the use of holography as a way to create pieces that hold a unique presentation of their artistic concepts, and because of their personal way of working, no two pieces of art work will be the same.
However, even though all arguments have been exhaustively debated for decades, there is still no common agreement that the use of holography can be considered as art. Nevertheless, the fact that art and holography can be complementary has a common ground that is still to be explored by both sides, in a way that will push the boundaries as far as possible to bring something new to their field.

For scientists the “abstract” option is not feasible, the facts need to be precisely above any doubt. The point of view for a scientist is that nothing is a mistake; there is an explanation for everything.

Artists are searching for new forms of expression that allow them to explore a visual perception of the world in a different perspective. The “abstract” option is an open door to develop the creativity that artists aspire to achieve with their work. Also, each viewer has their own perception of what is exposed to them, so each interpretation will be different leading to the evolution of newer and more creative methods of art making. As Krueger said:

“Artists today are not technologists. Most are careful to maintain the distinction between the two roles and would be offended if they were considered technicians. Yet, art and technology were once inextricably intertwined” (p.2) Myron Krueger (1991)

The citation by Krueger demonstrates that the line between art and technology is not clear and that artists can contribute to the creation of new technology. However the different point of view between artists and scientists can in some ways create critics from both sides arguing that each interpretation is made to suit their own arguments. Art is an open book; the viewer is part of the interpretation without having specific parameters to adhere to, free of restrictions and perpetuation.

Although the main concern for this paper is connected to holography and art, it would be remiss not to consider holography as a technological technique that has found an acceptable place within the scientific world. Its acceptance by science has perhaps had an easier route than that of holography and the art world. However Holography is part of a group of technological techniques that can be used in both fields.

Artists and Holography

For over 30 years artists have been using holography as a technique to explore space, time, movement and light in artwork. Nevertheless, holographic art is still seen as more of a scientific subject than an artistic subject to the public eye, due mainly to the existence of old conceptions about what art is. The definition that Art is an open book means that “everything” can be art and “nothing” can be art. The artist can be a psychologist, philosopher, doctor, mathematician, politician, teacher, and scientist, whatever needs to be depicted in the subject within their art. Artists have a “motivation” that is close to them which makes them unique, special and an expert in their field. The use of Art as a vehicle to explore and illustrate the variety of a subject is a form that allows artists to express themselves giving the freedom for individual interpretation. Equally Holography has its own characteristics, which provide new opportunities for artists and artwork creating the possibility of presenting a subject in 3D space on a flat surface Hans Wilhelmsson (1968).

Wilhelmsson (1968) continues:

“the question of how holography may be used by artists is left open”

Wilhelmsson, was discussing the scientific side of holography when at that time holo art was almost unknown by the general public. However at that point he could see the opportunity of this technique being used to create art work as the different methods used, for example photography or paint were unable to produce the combination of space, depth and movement that holography could provide.
The debate about holography being a creative method is continually debated because of the technical requirements needed. However, it is a technique that has gained more visibility with artists in their attempts to explore the visual display of the subjects. All techniques that allow the representation of light in art and creates 3D vision, which is close to that perceived naturally by the human eye, is something that attracts the attention of artists.

The phenomenon of light has been the subject of different interpretation for centuries. Capturing light in the most natural way is a continual challenge for artists in all fields.

Artists such as Paula Dowson, Michael Bleyenberg, Betsy Connors, Ikuo Nakamura, Sally Weber, and Pearl John are well known for their artwork with holography. These artists embrace holographic techniques to explore the representation of different subjects. However, not all of them embrace the scientific process. Some take time to understand the scientific process and engage with new developments in technology that will help to expand their art works. For example Dowson, who has spent significant time in understanding how holography works and how it can be applied to depict any subject, has presented her with the possibility of creating exceptional works.

Nevertheless, to utilize these techniques in art, requires the artist to understand and develop their scientific knowledge in some way, that will enable the association between art and science to come ever closer.

The fascinating possibility to combine different aspects such as light, time, movement and space into the process of artwork, gives us self-determination for a new level of creativity. This will allow us to expand, away from the restrictions that in some way have been limiting to art, in breaking through the ceiling of what can and cannot be achieved.

A good example of the close association between art and science is the artwork “Changing Thoughts” by Isabel Azevedo. Her interpretation of space, time and movement using digital holography enables the use of the magic of light, to take this art form to another dimension. For all artists and art forms if they use digital holography as an ingredient in their creative process and the presentation stage, the limits of what can be achieved are limitless.

When we look at the history and development of holography it is amazing to see how long artists have been trying to bring the best of this technique to the public eye. To help art and science embrace and develop even more, we need to help artists understand the great benefits and unique possibilities holographic techniques provide. The magic of light brings to life all artists unique characteristics in something amazing that would seduce any follower who is trying to understand the best way to capture and display their subject. Holography is a technique that captures and ‘plays’ with
light; it plays with light to create symbolism and expression of feeling, yet it captures light to enhance the finished piece when presented to the viewer.

Holography has crept into our daily lives without most people noticing due to it mainly being developed within scientific and technological applications. It is when it is being associated with art that people become more sceptical. Science has seen the opposite reaction, in that the technique is seen to be a tool that can enable artist’s scientists to open new windows of creativity within all artistic scientific formats. In many ways, the scientist’s view and the artist’s view are both the same, it is just that the majority do not realise they are looking at the beginnings of a new era and how this will be influenced by individual and different perspectives. The artist’s aim is to project the visual impact of their subject to all humankind in a way that viewers can see the piece in a unique and personal way. This leaves the door open for viewers to associate their experiences, and for the artist’s vision to help form a new perspective.

The development of new techniques under the umbrella term holography, such as digital holography, gives more perspectives and freedom for artists to express themselves using light. The hologram on its own only shows what was recorded by the artist at that precise moment; there is no interaction with viewers. Therefore there is a need for artists to use the beauty of light in their work to create a visual perception for the viewer, creating a space away from the real space – a new universe of art.

Light is the one ingredient that art has used since the start of time, and when we look at the very beginning of time when cavemen painted images using raw basic material, through to Da-Vinci expanding artistic boundaries, light and the positioning of light is the one thing that brings these to life for us. Now when we really embrace holographic science and what this does to the basic ingredient of light we see that what could be achieved is boundless.

CONCLUSION

Whilst some artists have used holography and holographic techniques for a period of time now, others continue to use it at base level. The time is right to call for a new way to view the technology and techniques for all art mediums and give the artist the freedom to collaborate with current and future advances found in the scientific domain and use the “light ingredient” to dramatic effect. This can help to transform the cultural perception of artists and art institutions to embrace holographic science and accept that it this is vehicle for taking art to new frontiers. The opportunities are endless and each new advance creates new dimensions and the possibility for the display of a subject in 3D and beyond.

The transition of art to meet the next generations need for more technical artists who can then reach out and help the “pure arts” generations to embrace the opportunity of expansion of light into mainstream art, can be achieved by producing robust art pieces that showcase the endless possibilities.
References

[1] KRUEGER, M W (1991) Artificial Reality II. 2nd ed. USA: Addison-Wesley Publishing Company, Inc.

[2] Wilhelmsson, H (1968) Holography: A New Scientific Technique of Possible use to Artists. Leonardo, Vol. 1, pp. 161-169.

[3, 4] Azevedo, I and Richardson, M 2011 Changing Thoughts: A Series Of Digital Art Holograms. In Proceedings of SPIE, Sao Francisco, February 2011. SPIE Volume: 7957. ISBN: 9780819484949