

Teleholographic Reality Performance: Staging and Its Relevance in the Cyberspace Era

Martinus Miroto

Indonesia Institute of Arts, Yogyakarta, INDONESIA.

mirototari@yahoo.com

ABSTRACT

Rapid cyberspace technology advancement in the 21st century has potentials to bring new colours to the contemporary performing art. The combination of tele-presence with pepper's ghost technology, for example, has yielded holographic telepresence, an evolving technology for full-motion, three-dimensional (3D) [video conferencing](#)[†]. Through the application of this technology, Teleholography Reality Performance has been inevitably developed. This article intends to describe the staging of Teleholographic Reality Performance with its relevance in the present era and the synthesis of bodily experience inside it through the study case of the production of "Body in Between" (2013) created by Martinus Miroto.*

Keywords: Teleholographic reality performance, cyberspace era, technology

INTRODUCTION

Based on my experience of engaging myself in the world of performing art for more than four decades, I am aware that performing art has been existing in a real space instead of virtual one. According to general point of view, the term "performance" itself means something that is going on in the real life. In other words, performing art is enjoyed through a face-to-face and direct interaction between the audience and the performers. In the field of dance and theatre, Hilda Kuper argued that a dance was a communication behaviour – "a text in motion",[‡] while Damono used a terminology "a text in alive", drama performance is a text that is "alive" and directly faces the audience at the same place and time.[§] In this context, performance could be defined as "a text in a motion that is alive". A performance has to directly face the public at the same time and place.^{**}

Theories stated that performing art had to directly face the audience. At present, it gained new challenges from the fact of the application of cyberspace technology^{††}. The fact showed a relation between a performance and audience which did not necessarily happen in the same

* Pepper's Ghost was found by John Henry Pepper and Henry Dircks (1860an). Pepper's Ghost shocked theatrical changes by using an effect that enabled someone or an object to manifest slowly in a scene. (http://www.eyeliner3d.com/peppers_ghost_history.html).

† Holographic telepresence systems can project realistic, full-motion, [real-time](#) 3D images of distant people and objects into a room, along with real-time audio communication, with a level of realism rivaling physical presence. Images of remote people and surrounding objects are captured, compressed, transmitted over a broadband network, decompressed, and finally projected using [laser](#) beams in much the same way as a conventional [hologram](#) is produced. (<http://whatis.techtarget.com/definition/holographic-telepresence>)

‡ Hanna. 1987: 4

§ Damono. 2012: 130-133

** Damono. 2012: 130.

†† Cyberspace is "the notional environment in which communication over computer networks occurs." The term was first used in science fiction and cinema in the 1980s, was adopted by computer professionals and became a household term in the 1990s. During this period, the uses of the internet, networking, and digital communication were all growing dramatically and the term "cyberspace" was able to represent the many new ideas and phenomena that were emerging. (<http://en.wikipedia.org/wiki/Cyberspace>)

space and time. In fact, currently the cyberspace and holographic technology can “unite” human beings who are located in different spaces and time. With the emergence of cyberspace technology, human beings can be presented in virtual images. Even social activities that used to happen in a real space now can be done in cyberspace.

So far, the application of cyberspace social network has been expanding in the context of communicating ideas and rehearsal in dance. Janis Brenner, an American choreographer had a rehearsal through video calling application called Skype.^{**} Interaction using technology has, for sure, affected the world of the performing art. In addition, the reality mentioned above has brought people to an awareness that not only is the cyberspace technology a new entertainment application, but also a new concept that stimulates new thoughts and progress in the world of performing art. Cyberspace and holographic telepresence technology have inspired the creation of hybrid performance that mingles reality media with tele-holography in the same space.

Medium of teleholographic reality performing art include two subjects: real body and teleholographic image. The real body refers to the presence of the real performers on the stage while the teleholographic image refers to performers located in different places, that are presented in three dimensional images through the application of holographic telepresence technology. The term “teleholographic” is derived from “holographic tele-presentation”, which is a live streaming from a distance in a real time (live holographic telepresence).

Seen from the approach of mingling the real world and teleholography this topic seems to be relevant to the thoughts of Mikhail Bakhtin about hybrid concept conveyed as follows:

We call hybrid construction any utterance that belongs, by its grammatical (syntactic) and compositional features, to a single speaker, but that actually constrains intermingled within it two utterances, two manners of speaking, two styles, two “languages,” two semantic and axiological horizons.^{§§}

It is no doubt to say that the mingling of the real world and teleholographic one has resulted hybrid teleholographic reality performance. The result is a form of performance that mingles the reality world and teleholographic world. The real world presents performers in real time and space on the stage while the teleholographic world projects distant performers and objects into a room using pepper’s ghost technology in realistic, full-motion, [real-time](#) 3D images along with real-time audio communication, with a level of realism rivaling physical presence.

The holographic telepresence technology that is presented through telepresence and pepper’s ghost technology has been developed by various institutions and individuals. For example, Musion Eyeliner Showreels applied a presentation in a fashion show by presenting a holographic image that had been recorded and complemented with animation.^{***} In a separate area of performing art, hologram is actually technology that has been long used as an expression in digital performance, such as “Poles” dance created by PPS Dance of Montreal which used holography, and it was accordingly called holographic choreography (1996-9). This digital dance performance combined a video in a hologram image with real bodies. It is explained by Timothy Murray in the following quote:

^{**} Janis Brenner. September 13, 2011. Interview through Skype.

^{§§} Bakhtin. 1984: 73

^{***} http://www.eyeliner3d.com/fifpro_world_xi_player_awards.html

Dancers Pierre-Paul Savoie and Jeff Hall perform an enigmatic rivalry among dazzling back projections and stunning holograms that blur the difference between actual performer and virtual image while altering the spectators' perceptions of time, distance, and space.^{†††}

Holographic choreography draws together the virtual bodies, that have been recorded in a High Definition (HD) video, with reality bodies. The recording was performed on the stage using holographic technology and produced a three dimensional image. Teleholographic Reality Performance presents performers in three dimensional images, interacts directly from different spaces in a real time (live) with live performers on stage. This performance approach has created a particular challenge in terms of performance space, art media, creation process and facts of bodily experience at the present time and its relevance with the contemporary world. The following is an explanation based on a case study of a hybrid Performance *Body in Between I* created (2013). *Body in Between* was a hybrid teleholographic reality performance that combined media of the real world with teleholography that was performed (work in progress) in Banjarmili Studio, Yogyakarta in November 2013.

STAGING OF TELEHOLOGRAPHY REALITY PERFORMANCE

Teleholographic reality Performance requires two different spaces that have different functions and facilities. The first space functions as “a space for teleholographic reality performance” while the second space functions as “augmented reality performance”^{‡‡‡}. The first space unites the reality world and teleholographic world, which was a performance of a three dimensional holographic telepresence image that was directly showed from a different space at the same time. This space, in addition to a space for audience, was also equipped with the application of telepresence and pepper's ghost technology on the stage. The main purpose of this space was to unite the reality world and teleholographic world from the view point of the audience. What needed to be noted was the need of arranging the seats of the audience in order that they could enjoy the whole teleholographic image. In other words, holography could not be watched wholly if there was no distinct view point.



^{†††} Campbell and Kear. 2001: 50.

^{‡‡‡} Augmented reality (AR) is a live direct or indirect view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics or [GPS](#) data. With the help of advanced AR technology (e.g. adding [computer vision](#) and [object recognition](#)) the information about the surrounding real world of the user becomes [interactive](#) and digitally manipulable. Artificial information about the environment and its objects can be overlaid on the real world. (http://en.wikipedia.org/wiki/Augmented_reality)

Image 1. Miroto (reality) and Osamu Jareo (Teleholography from Kyoto) Teleholographic Reality Rehearsal

Tele-presentation technology has been applied since 1980s. Bracken and Skalski in *Immersed in Media Telepresence in Everyday Life* argued as follows:

“Marvin Minsky coined the term “telepresence” in 1980 to refer to the manipulation of remote objects through technology, and Sheridan (1992) broadened this definition (as “presence”) to include the feeling people have while immersed in virtual environments such as those created through Virtual Reality (VR) technology.”^{§§§}

Holography was a technique to change a two dimensional picture to a three dimensional one by various ways, one of which was the one chosen in this article that is called pepper's ghost technology,^{****} an illusion technique used in performing art and several magic tricks. Using a piece of glass and special lighting techniques can make an object seem to appear and fade away or create an object and change it into another object. This technique was first demonstrated by [John Henry Pepper](#) in 1860s.^{††††}

The application of holographic technology can use pepper's ghost technology in a very simple technique. It needs an HD projector with a minimum of 5,000 lumen to perform a virtual image that can be screened on a white screen monitor that lies on the floor. The two dimension virtual image will be caught by a reflector (made of film foil, glass or acrylic) that is set in a 45° angle above the white screen laid on the floor. It produces a three dimensional visual image behind the reflector which can be seen by the audience. The reflector is translucent, which in certain lighting is invisible to the audience.

Stage lighting equipment of hybrid teleholographic reality performance uses a photography light called kinoflow and [light-emitting diode](#) (LED) lights with particular intensity to create lighting balance between the teleholographic subject and reality subject. Light intensity, layout and colours of light also need to be selected meticulously to equalise the illusion between the real subject and teleholographic subject.

Teleholographic reality performance that presents several distant tele-collaborators through captured, compressed, transmitted over a broadband network, decompressed, and finally projected using pepper's ghost technology needs to consider the possibility of traffic jam during the rehearsal or shows. In fact, if traffic jam occurs during the live streaming it will cause the degrading quality of images or sound, or even worse, disconnection. To anticipate it, it needs several IP addresses^{††††} in accordance with the number of the collaborators. In other words, each collaborator needs to be facilitated with a computer and IP address in order to avoid internet conflict among the collaborators. Computers, HD cameras, monitors and internet connection with sufficient bandwidth will be needed to support the sending and receiving of live video streaming in a H D video quality.

Tele-collaborators who transmit their videos to the teleholographic reality performance space over a broadband network need augmented reality spaces in which they do a long distance interaction (telepresence). This space is equipped with a minimum of 2 Megabyte (MB)

^{§§§} Cheryl Campanella Bracken and Paul D. Skalski, *Immersed in Media Telepresence in Everyday Life*. Routledge, New York, 2010: 270.

^{****} (http://www.ex-ch.com/udk/courses/2010-ws-DigitalClass/AR_Technology_Survey)

^{††††} http://www.ex-ch.com/udk/courses/2010-ws-DigitalClass/AR_Technology_Survey

^{††††} An Internet Protocol address (IP address) is a numerical label assigned to each device (e.g., computer, printer) participating in a [computer network](#) that uses the [Internet Protocol](#) for communication. (http://en.wikipedia.org/wiki/IP_address)

bandwidth and broadband network (live streaming application), such as Skype, ooVoo and others that transmits video directly to the performance space. “Augmented reality studio” can run both with and without the audience. If it is designed as a performance space (Augmented Reality Show) it will need a space for the audience and provide a monitor with a projector and a wide screen in order that audience can watch the performance of real performer but at the same time also watch an “augmented reality” image in two dimension in which the performer appears in a different space and interact with other collaborators.



Image 2. Augmented Reality^{§§§§} Audience can watch the performance of real performer but at the same time also watch an “augmented reality” image in two dimensions in which the performer appears in a different space and interact with other collaborators.

The “augmented reality show space” with audience can be made by using a proscenium space while an “augmented reality space” without audience can be made by using a studio with a minimum size of 4 m x 6 m. Tele-collaborator wears light coloured costume with black floor and background which help the camera captures only the picture of the performer.

This space uses light produced by kinoflow light or HMI 575 that can be absorbed by the black cloth which functions as the background so that the camera captures the picture of the subject clearly. The tele-collaborators have freedom to position lighting in their space. Ideally, however, the direction of most lighting should be from right corner angle, left corner angle and upper front angle. This space needs a High Definition video camera which can be replaced by a Logitech webcam HD 925 with 3.4 m distance between the dancers and camera to produce the realistic, full-motion, [real-zise](#) 3D body images. When the subject is far from the camera the image produced will be small and, on the contrary, when the subject is closer the image produced will be bigger.



§§§§ <https://www.google.com/search?q=augmented+reality+show&source>

Image 3. Tele-collaborators wears light coloured costumes with black floor and background which help the camera captures only the picture of the performer

Each collaborator needs one unit of computer, one unit of camera and one IP address to transmit and receive live video streaming. The tele-collaborator receives images of remote people and surrounding objects transmitted from the teleholographic reality performance stage and projected on monitor in which audience can watch he or she interacts with other performers in distance location. Ideally, the tele-collaborator is equipped with four monitors located in the upper front, right and left sides. Monitors that are placed in every angle will be very helpful for the collaborator in doing a tele-interaction.

NEW BODILY EXPERIENCE

The first thing that is felt when someone is interacting in the cyberspace in a teleholographic reality performance world is the absence of physical contact with his or her partner. The absence of sense of touch causes a feeling of “distant” from the place where the partner is as they are spatially separated. The feeling of “close” is built through the strength of holographic telepresence systems which project realistic with real-time audio communication, full-motion, [real-time](#) 3D images, along with a level of realism rivaling physical presence.

Interaction with audio visual subject at a real time creates a feeling of “close”, as if a partner is close to the tele-collaborator. The fact of the presence of “distant” and “close” feeling of the collaboration in teleholographic reality performance is a new bodily experience in performing art.



Image 4: Yutsen Liu (teleholography from Taipei), Mugiyono and Slamet Gundono (Reality); Teleholographic Reality Performance “Body in Between” Work in Progress

When a teleholographic reality performance is watched from one angle, the position of the audience is very similar with that in a cinema, where the accuracy of view point between the spectator and the visual image can influence the level of realism appearance of the image showed on the screen. The appearance of a holographic image can perfectly come up in an accurate view point and bring out a feeling of reality, although it is, in fact, virtual. An experience of interaction in a rehearsal leaves an impression that the nature of reality and virtuality have united in a teleholographic reality performance space. The impression came up when I, who acted as a director, gave some directions to the collaborators both the real and virtual performers. There was a strong impression that the virtual performers really existed as did the collaborators in my studio. The impression was strengthened by the three dimensional visualisation in a size of real full-body with real-time audio communication and the level of

realism rivaling physical gestures presence during their interaction with me – who directed them from the position of the audience. In other words, holography that was created by pepper's ghost technology gave an experience of virtual reality that was more visible than interaction through non-holographic telepresence technology.

When I was focusing on the rehearsal, my awareness of the “presence” of body was considerably “solid”, in a sense that I did not sense the difference between real body and virtual body. When the rehearsal was completed, however, and the teleholographic collaborators had signed out and digitally disappeared, it became a moment that brought me back to my awareness that actually the images of the bodies of the teleholographic collaborators were truly abstract and virtual. Consequently, I thoroughly came back to the space of reality. The implication was that body between reality and virtuality eventually ended at this moment.

A feeling that was generally felt by the collaborators was the “distant-close” feeling. This is actually also felt by everyone who is playing and communicating through the cyberspace. In this context, the experience was usually closed or private with the use of devices, such as smart phones or personal computers. On the contrary, teleholographic reality performance gave them an bodily experience in such a public space where the collaborator share their experience with the audience.

Nowadays the cyberspace provides freedom of expression, entertainment and knowledge that cannot be easily obtained in the reality life. The two extremes of human body experience that involves freedom in the internet and bond in the real life can become a new fact of bodily experience that can influence human life.

THE RELEVANCE OF TELEHOLOGRAPHIC REALITY PERFORMANCE

The direct contact with the virtual world that brings out “distant-close” feeling, body experience between the reality and virtual worlds and people's ability to overcome a long distance that keep them apart can be taken as a particular traumatic experience. The word “traumatic” here refers to its original meaning in Greek, which is “wound” that leaves a scar (Hill, 2006: 48). In this context the experience is “an experience that leaves impression and unforgettable”. It happens because the experience of having an interaction in the cyberspace brings a new awareness of space and body. It needs more explanation, however, about experiencing the “wound” mentioned above as it has been studied in psychology; wound in psychology is not necessarily identical with “painful wound”, but it can also mean “wound that gives pleasure”, enlightenment, or encourage the birth of inspiration – a wound for a masochist^{*****} for instance.

Regardless the ambiguity mentioned, performance psychoanalyst Herbert Blau, just like Freud, stated that performing art both as a process (rehearsal) and as a performance, can become a vehicle to release all forms of trauma inside oneself. Particularly in a rehearsal, the body of a performer is freed to wander and go deeper into the feelings inside them to be expressed explicitly (Campbell & Kear [Ed.], 2001: 30-31). It indirectly shows the process of releasing several of their inner experiences. Those experiences could be positive (happy) or negative (sad). If the experiences are positive, the release of their feelings will strengthen their inner power. On the contrary, if their experiences are negative the release of their feelings will decrease their inner burden. This is a psychoanalysis practice in psychology.

***** Masochists are people who gain pleasure through pain.

Further to that, Murray stated in addition to its form as a traumatic experience, it actually could also become encouragement of creation power for the artists. It was as if there was a cycle that after a person got trauma he or she gained a new overwhelming energy to create a new piece of art work and such a process kept continuing (Campbell & Kear [Ed.], 2001: 50).

Personally speaking, I am of an opinion that the creation of teleholographic reality performance concerns the two aspects above, which is as an expression of traumatic experiences, both the positive and negative ones, and as a manifestation of inspiration of direct contact with the cyberspace.

The cyberspace has been now global. In a simple way globalisation can be defined as a process of narrowing space and time caused by the rapid progress of information and communication technology. It is not particularly clear since when globalisation started and was experienced by people. Some experts, however, identified that globalisation era started in the late 1980s. It was triggered by several important moments in the world, such as the fall down of Communism in Soviet that made boundaries among countries fade away (the absence of Western Bloc and Eastern Bloc), the acceptance of association of liberalism ideas worldwide,^{††††} and the invention of the internet by a US computer company, IBM (Sardar & Loon, 2001: 162-163).

The main essence of globalisation was the narrowing of space and time. Mobility among countries in the era, therefore, should not become something that really matters (complicated). Likewise, rapid progress of hybrid (exchanging) ideas and culture should consider very common. All have been caused by technology advancement which, indeed, support diverse activities described above. It is no question that Anthony Giddens (2009: 2) called the globalisation era as “postmodern era”, which refers to an era in which information rapidly flows.

In regards to the above description of constellation, teleholographic reality performance might become a representation of forms of performance in the globalisation era. It refers to the first point about the irrelevance of space and time boundaries in the globalisation era. It can be reviewed that long distance which separate artists across the world should not have any significant problems to collaborate due to technology invention to present their figures live on the stage in three dimensional images.

It needs to be noted that in the process of teleholographic reality performance there is an awareness of challenging the convention of sight: staging, choreography, training, audience, and production. Indirectly, the approach has absolutely changed a general view point about studio and space for body exercise that is generally real. It was stated by Murray (in Campbell & Kear [Ed.], 2001: 50) as follows:

“...recent developments in digital technology once again offer a promising deformation of the visual apparatus in a way that refigures and reenergizes performance while providing materialized metaphors for a better understanding of the vicissitudes of artistic affect. Both digital performance and recent French rereadings of sublimation thus prompt their audience ‘to unlearn the convention of sight’ so that the horizon or effect of the visual itself might destabilize psychoanalytical and philosophical assumptions about intersubjective and social relations.”

The experience of being in contact with the cyberspace has become an ambiguity. On the one hand, the process of creating a teleholographic reality performance brings to a new awareness

^{††††} Including human right, gender, global market, etc.

of a new format of performance that is not yet commonly or rarely practiced. On the other hand, the facility needed is hardly available.

CONCLUSION

Based on the description conveyed in this article, conclusions that can be drawn about virtual reality show are:

1. The concept of teleholographic reality show is an application of three aspects: performance, telepresence and holography technologies. The approach of creating teleholographic reality performance can resolve geographic obstacles faced by artists. With this approach, geographic span should no longer become obstacles for international artists to collaborate. This approach is potential to become a new alternative of virtual telecollaboration for international artists that are separated by space and time.
2. This work produces methods of hybrid teleholographic reality performance that combines reality bodies and teleholographic images.
3. Bodily experience between reality and teleholography as an implication of the use of cyberspace technology, which can open various new opportunities to develop creativity in performing art.
4. Ideas of the teleholographic reality performance also has relevance to the contemporary time considering that in such a constellation of the cyberspace era “human physical presence” can be represented by virtual images. The format of teleholographic reality performance, in this context, has a potential to become an expression and representation of performing art in the cyberspace era.
5. The dialogue impact between my body with the world of Internet technology has caused exploration activities which bring an awareness that creating a piece of art work that is considered unconventional using quite sophisticated technology with limited financial capacity can come true if there is a strong belief about what will be gained in a positive manner.
6. Teleholographic reality performance staging such as: choreography, stagecraft, sound, costumes, make up, light, etc. needs to be explored furthermore.
7. Teleholographic reality performance approach certainly has positive and negative impacts in humanity context. It needs further study, therefore, to find the impacts of this approach on humanity.

REFERENCES

- [1] Bracken, C. C., & Skalski, P. D. (2010). *Immered in Media Telepresence in Everyday Life*. New York: Routledge.
- [2] Campbell, P., & Adrian, K. (Ed.). (2001). *Psychoanalysis and Performance*. London: Routledge.
- [3] Damono, S. D. (2012). *Alih Wahana*. Editum
- [4] Giddens, A. (2009). *Konsekuensi-konsekuensi Modernitas*. Yogyakarta: Kreasi Wacana.
- [5] Hanna, J. L. (1987). *To Dance is Human*. Chicago: The University of Chicago Press.
- [6] Hill, P. (2006). *Lacan untuk Pemula*. Yogyakarta: Kanisius.
- [7] Packer, R., & Ken, J. (2002). *Multimedia: From Wagner to Virtual Reality*. New York: W. W. Norton Company Inc.
- [8] Robert, T. L. (2009). *Collaboration in Contemporary Artmaking: Practice and Pedagogy*. Ohio: The Ohio State University.
- [9] Sardar, Z., & Borris, v. L. (2001). *Cultural Studies for Beginners*. Yogyakarta: Mizan.
- [10] http://www.eyeliner3d.com/peppers_ghost_history.html
- [11] <http://whatis.techtarget.com/definition/holographic-telepresence>
- [12] Brenner, J. (2011). Interview through Skype, September 13, 2011. <http://en.wikipedia.org/wiki/Cyberspace>
- [13] http://www.eyeliner3d.com/fifpro_world_xi_player_awards.html
- [14] http://en.wikipedia.org/wiki/Augmented_reality
- [15] http://www.ex-ch.com/udk/courses/2010-ws-DigitalClass/AR_Technology_Survey
- [16] http://en.wikipedia.org/wiki/IP_address
- [17] <https://www.google.com/search?q=augmented+reality+show&source>