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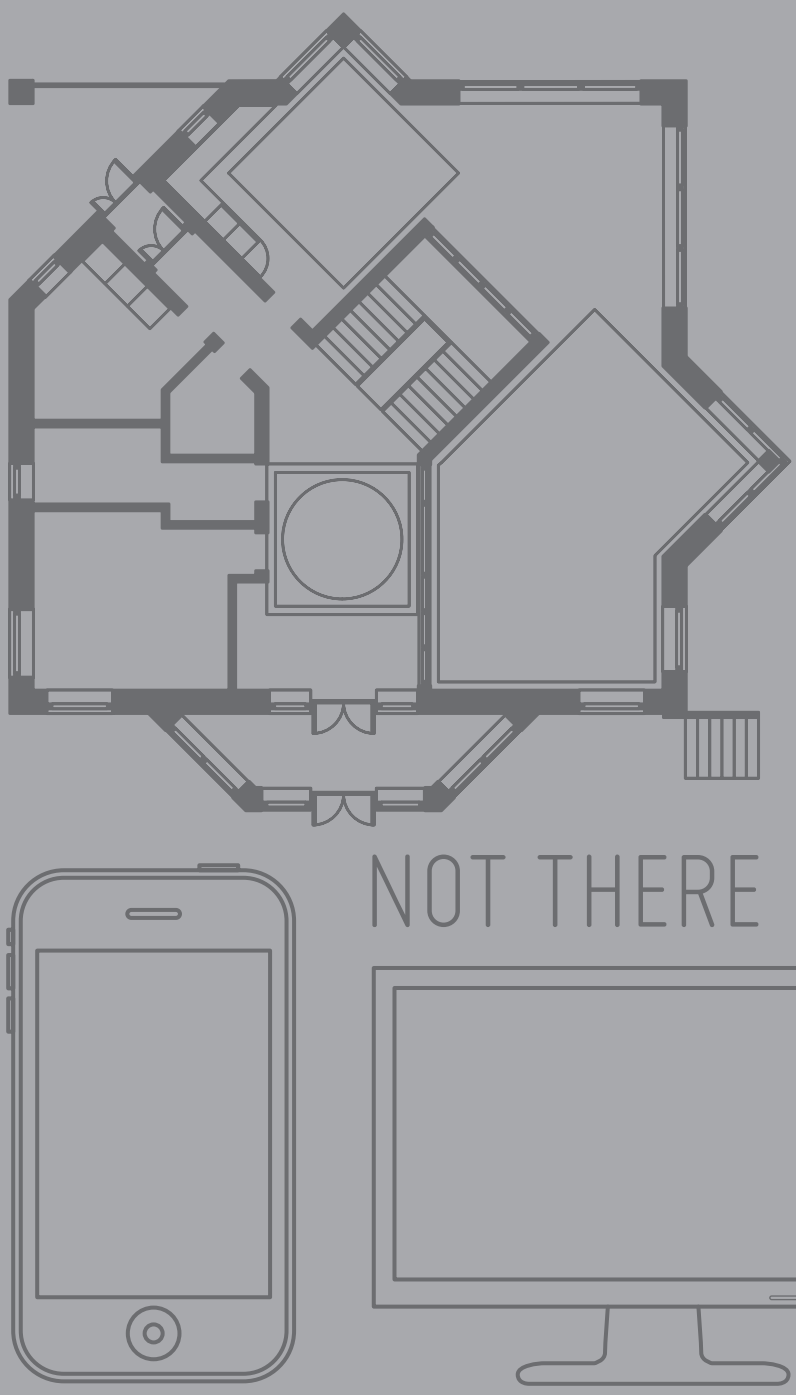
LEONARDO ELECTRONIC ALMANAC

VOL 19 NO 2 VOLUME EDITORS **LANFRANCO ACETI** AND **RICHARD RINEHART**
EDITORS **ÖZDEN ŞAHİN**, **JONATHAN MUNRO** AND **CATHERINE M. WEIR**

This LEA publication has a simple goal: surveying the current trends in augmented reality artistic interventions. There is no other substantive academic collection currently available, and it is with a certain pride that LEA presents this volume which provides a snapshot of current trends as well as a moment of reflection on the future of AR interventions.



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Leonardo Electronic Almanac
Volume 19 Issue 2
DATE OF PUBLICATION April 15, 2013
ISSN 1071-4391
ISBN 978-1-906897-23-9
The ISBN is provided by Goldsmiths, University of London.

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LEA PUBLISHING & SUBSCRIPTION INFORMATION

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- www.twitter.com/LEA_twitts
- www.flickr.com/photos/lea_gallery
- www.facebook.com/pages/Leonardo-Electronic-Almanac/209156896252

Leonardo Electronic Almanac is published by:
Leonardo/ISAST
211 Sutter Street, suite 501
San Francisco, CA 94108
USA

Leonardo Electronic Almanac (LEA) is a project of Leonardo/The International Society for the Arts, Sciences and Technology. For more information about Leonardo/ISAST's publications and programs, see http://www.leonardo.info or contact isast@leonardo.info.

Leonardo Electronic Almanac is produced by Passero Productions.

LEONARDO ELECTRONIC ALMANAC, VOLUME 19 ISSUE 2

Not Here Not There

VOLUME EDITORS
LANFRANCO ACETI AND RICHARD RINEHART

EDITORS
ÖZDEN ŞAHİN, JONATHAN MUNRO AND CATHERINE M. WEIR

The Leonardo Electronic Almanac
acknowledges the kind support
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Sabancı Üniversitesi

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Operational & Curatorial Research in Contemporary Art, Design, Science & Technology

Not Here, Not There: An Analysis Of An International Collaboration To Survey Augmented Reality Art

Every published volume has a reason, a history, a conceptual underpinning as well as an aim that ultimately the editor or editors wish to achieve. There is also something else in the creation of a volume; that is the larger goal shared by the community of authors, artists and critics that take part in it.

This volume of LEA titled *Not Here, Not There* had a simple goal: surveying the current trends in augmented reality artistic interventions. There is no other substantive academic collection currently available, and it is with a certain pride that both, Richard Rinehart and myself, look at this endeavor. Collecting papers and images, answers to interviews as well as images and artists' statements and putting it all together is perhaps a small milestone; nevertheless I believe that this will be a seminal collection which will showcase the trends and dangers that augmented reality as an art form faces in the second decade of the XXIst century.

As editor, I did not want to shy away from more critical essays and opinion pieces, in order to create a documentation that reflects the status of the current thinking. That these different tendencies may or may not be proved right in the future is not the reason for the collection, instead what I believe is important and relevant is to create a historical snapshot by focusing on the artists and authors developing artistic practices and writing on augmented reality. For this reason, Richard and I posed to the contributors a series of questions that in the variegated responses of the artists and authors will evidence and stress similarities and differences, contradictions and behavioral approaches. The interviews add a further layer of documentation which, linked to the artists' statements, provides an overall understanding of the hopes for this new artistic playground or new media extension. What I personally wanted to give relevance to in this volume is the artistic creative process. I also wanted to evidence the challenges faced by the artists in creating artworks and attempting to develop new thinking and innovative aesthetic approaches.

The whole volume started from a conversation that I had with Tamiko Thiel – that was recorded in Istanbul at Kasa Gallery and that lead to a curatorial collaboration with Richard. The first exhibition *Not Here* at the Samek Art Gallery, curated by Richard Reinhart, was juxtaposed to a response from Kasa Gallery with the exhibition *Not There*, in Istanbul. The conversations between Richard and myself produced this final volume – *Not Here, Not There* – which we both envisaged as a collection of authored papers, artists' statements, artworks, documentation and answers to some of the questions that we had as curators. This is the reason why we kept the same questions for all of the interviews – in order to create the basis for a comparative analysis of different aesthetics, approaches and processes of the artists that work in augmented reality.

When creating the conceptual structures for this collection my main personal goal was to develop a link – or better to create the basis for a link – between ear-

ISSN 1071-4391 ISBN 978-1-906897-23-9

lier artistic interventions in the 1960s and the current artistic interventions of artists that use augmented reality.

My historical artist of reference was Yayoi Kusama and the piece that she realized for the Venice Biennial in 1966 titled *Narcissus Garden*. The artwork was a happening and intervention at the Venice Biennial; Kusama was obliged to stop selling her work by the biennial's organizers for 'selling art too cheaply.'

"In 1966 [...] she went uninvited to the Venice Biennale. There, dressed in a golden kimono, she filled the lawn outside the Italian pavilion with 1,500 mirrored balls, which she offered for sale for 1,200 lire apiece. The authorities ordered her to stop, deeming it unacceptable to 'sell art like hot dogs or ice cream cones.'" [1]

The conceptualization and interpretation of this gesture by critics and art historians is that of a guerrilla action that challenged the commercialization of the art system and that involved the audience in a process that revealed the complicit nature and behaviors of the viewers as well as use controversy and publicity as an integral part of the artistic practice.

Kusama's artistic legacy can perhaps be resumed in these four aspects: a) engagement with audience's behaviors, b) issues of art economy and commercialization, c) rogue interventions in public spaces and d) publicity and notoriety.

These are four elements that characterize the work practices and artistic approaches – in a variety of combinations and levels of importance – of contemporary artists that use augmented reality as a medium. Here, is not perhaps the place to focus on the role of 'publicity' in art history and artistic practices, but a few words have to be spent in order to explain that publicity for AR artworks is not solely a way for the artist to gain notoriety, but an integral part of the artwork, which in order to come into existence and generate interactions and engagements with the public has to be communicated to the largest possible audience.

"By then, Kusama was widely assumed to be a publicity hound, who used performance mainly as a way of gaining media exposure." [2] The publicity obsession, or the accusation of being a 'publicity hound' could be easily moved to the contemporary group of artists that use augmented reality. Their invasions of spaces, juxtapositions, infringements could be defined as nothing more than publicity stunts that have little to do with art. These accusations would not be just irrelevant but biased – since – as in the case of Sander Veenhof's analysis in this collection – the linkage between the existence of the artwork as an invisible presence and its physical manifestation and engagement with the audience can only happen through knowledge, through the audience's awareness of the existence of the art piece itself that in order to achieve its impact as an artwork necessitates to be publicized.

Even if, I do not necessarily agree with the idea of a 'necessary manifestation' and audience's knowledge of the artwork – I believe that an artistic practice that is unknown is equally valid – I can nevertheless understand the process, function and relations that have to be established in order to develop a form of engagement and interaction between the AR artwork and the audience. To condemn the artists who seek publicity in order to gather audiences to make the artworks come alive is perhaps a shortsighted approach that does not take into consideration the audience's necessity of knowing that interaction is possible in order for that interaction to take place.

What perhaps should be analyzed in different terms is the evolution of art in the second part of the XXth century, as an activity that is no longer and can no longer be rescinded from publicity, since audience engagement requires audience attendance and attendance can be obtained only through communication / publicity. The existence of the artwork – in particular of the successful AR artwork – is strictly measured in numbers: numbers of visitors, numbers of interviews, numbers of news items, numbers of talks, numbers of interactions, numbers of clicks, and, perhaps in a not too distant future, numbers of coins gained. The issue of being a 'publicity hound' is not a problem that applies to artists alone, from Andy Warhol to Damien Hirst from Banksy to Maurizio Cattelan, it is also a method of evaluation that affects art institutions and museums alike. The accusation moved to AR artists of being media whores – is perhaps contradictory when arriving from institutional art forms, as well as galleries and museums that have celebrated publicity as an element of the performative character of both artists and artworks and an essential element instrumental to the institutions' very survival.

The publicity stunts of the augmented reality interventions today are nothing more than an acquired methodology borrowed from the second part of the XXth century. This is a stable methodology that has already been widely implemented by public and private art institutions in order to promote themselves and their artists.

Publicity and community building have become an artistic methodology that AR artists are playing with by making use of their better knowledge of the AR media. Nevertheless, this is knowledge born out of necessity and scarcity of means, and at times appears to be more effective than the institutional messages arriving from well-established art organizations. I should also add that publicity is functional in AR interventions to the construction of a community – a community of aficionados, similar to the community of 'nudists' that follows Spencer Tunic for his art events / human installation.

I think what is important to remember in the analysis of the effectiveness both in aesthetic and participatory terms of augmented reality artworks – is not their publicity element, not even their sheer numbers (which, by the way, are what has made these artworks successful) but their quality of disruption.

The ability to use – in Marshall McLuhan's terms – the medium as a message in order to impose content bypassing institutional control is the most exciting element of these artworks. It is certainly a victory that a group of artists – by using alternative methodological approaches to what are the structures of the capitalistic system, is able to enter into that very capitalistic system in order to become institutionalized and perhaps – in the near future – be able to make money in order to make art.

Much could be said about the artist's need of fitting within a capitalist system or the artist's moral obligation to reject the basic necessities to ensure an operational professional existence within contemporary capitalistic structures. This becomes, in my opinion, a question of personal ethics, artistic choices and existential social dramas. Let's not forget that the vast majority of artists – and AR artists in particular – do not have large sums and do not impinge upon national budgets as much as banks, financial institutions, militaries and corrupt politicians. They work for years

1. David Pilling, "The World According to Yayoi Kusama," *The Financial Times*, January 20, 2012, http://www.ft.com/cms/s/2/52ab168a-4188-11e1-8c33-00144feab49a.html#axzz1kDck8rzm (accessed March 1, 2013).

2. Isabelle Loring Wallace and Jennie Hirsh, *Contemporary Art & Classical Myth* (Farnham; Burlington, VT: Ashgate, 2011), 94.

ISSN 1071-4391 ISBN 978-1-906897-23-9
ISSN 1071-4391 ISBN 978-1-906897-23-9

with small salaries, holding multiple jobs and making personal sacrifices; and the vast majority of them does not end up with golden parachutes or golden handshakes upon retirement nor causes billions of damage to society.

The current success of augmented reality interventions is due in small part to the nature of the medium. Museums and galleries are always on the lookout for 'cheap' and efficient systems that deliver art engagement, numbers to satisfy the donors and the national institutions that support them, artworks that deliver visibility for the gallery and the museum, all of it without requiring large production budgets. Forgetting that art is also about business, that curating is also about managing money, it means to gloss over an important element – if not the major element – that an artist has to face in order to deliver a vision.

Augmented reality artworks bypass these financial challenges, like daguerreotypes did by delivering a cheaper form of portraiture than oil painting in the first part of the XIXth century, or like video did in the 1970s and like digital screens and projectors have done in the 1990s until now, offering cheaper systems to display moving as well as static images. AR in this sense has a further advantage from the point of view of the gallery – the gallery has no longer a need to purchase hardware because audiences bring their own hardware: their mobile phones.

The materiality of the medium, its technological revolutionary value, in the case of early augmented reality artworks plays a pivotal role in order to understand its success. It is ubiquitous, can be replicated everywhere in the world, can be installed with minimal hassle and can exist, independently from the audience, institutions and governmental permissions. Capital costs for AR installations are minimal, in the order of a few hundred dollars, and they lend themselves to collaborations based on global networks.

Problems though remain for the continued success of augmented reality interventions. Future challenges are in the materialization of the artworks for sale, to name an important one. Unfortunately, unless the relationship between collectors and the 'object' collected changes in favor of immaterial objects, the problem to overcome for artists that use augmented reality intervention is how and in what modalities to link the AR installations with the process of production of an object to be sold.

Personally I believe that there are enough precedents that AR artists could refer to, from Christo to Marina Abramovich, in order develop methods and frameworks to present AR artworks as collectable and sellable material objects. The artists' ability to do so, to move beyond the fractures and barriers of institutional vs. revolutionary, retaining the edge of their aesthetics and artworks, is what will determine their future success.

These are the reasons why I believe that this collection of essays will prove to be a piece, perhaps a small piece, of future art history, and why in the end it was worth the effort.

Lanfranco Aceti
Editor in Chief, Leonardo Electronic Almanac
Director, Kasa Gallery

ISSN 1071-4391 ISBN 978-1-906897-23-9

Site, Non-site, and Website

In the 1960's, artist Robert Smithson articulated the strategy of representation summarized by "site vs. non-site" whereby certain artworks were simultaneously abstract and representational and could be site-specific without being sited. A pile of rocks in a gallery is an "abstract" way to represent their site of origin. In the 1990's net.art re-de-materialized the art object and found new ways to suspend the artwork online between website and non-site. In the 21st century, new technologies suggest a reconsideration of the relationship between the virtual and the real. "Hardlinks" such as QR codes attempt to bind a virtual link to our physical environment.

Throughout the 1970's, institutional critique brought political awareness and social intervention to the site of the museum. In the 1980's and 90's, street artist such as Banksy went in the opposite direction, critiquing the museum by siting their art beyond its walls.

Sited art and intervention art meet in the art of the trespass. What is our current relationship to the sites we live in? What representational strategies are contemporary artists using to engage sites? How are sites politically activated? And how are new media framing our consideration of these questions? The contemporary art collective ManifestAR offers one answer,

> *"Whereas the public square was once the quintessential place to air grievances, display solidarity, express difference, celebrate similarity, remember, mourn, and reinforce shared values of right and wrong, it is no longer the only anchor for interactions in the public realm. That geography has been relocated to a novel terrain, one that encourages exploration of mobile location based monuments, and virtual memorials. Moreover, public space is now truly open, as artworks can be placed anywhere in the world, without prior permission from government or private authorities – with profound implications for art in the public sphere and the discourse that surrounds it."*

ManifestAR develops projects using Augmented Reality (AR), a new technology that – like photography before it – allows artists to consider questions like those above in new ways. Unlike Virtual Reality, Augmented Reality is the art of overlaying virtual content on top of physical reality. Using AR apps on smart phones, iPads, and other devices, viewers look at the real world around them through their phone's camera lens, while the app inserts additional images or 3D objects into the scene. For instance, in the work *Signs over Semiconductors* by Will Pappenheimer, a blue sky above a Silicon Valley company that is "in reality" empty contains messages from viewers in skywriting smoke when viewed through an AR-enabled Smartphone.

AR is being used to activate sites ranging from Occupy Wall Street to the art exhibition ManifestAR @ ZERO1 Biennial 2012 – presented by the Samek Art Gallery simultaneously at Bucknell University in Lewisburg, PA and at Silicon Valley in San Jose, CA. From these contemporary non-sites, and through the papers included in this special issue of LEA, artists ask you to reconsider the implications of the simple question *wayn* (where are you now?)

Richard Rinehart
Director, Samek Art Gallery, Bucknell University

ISSN 1071-4391 ISBN 978-1-906897-23-9

Leonardo Electronic Almanac
Volume 19 Issue 2

 ISSN 1071-4391 ISBN 978-1-906897-23-9

ISSN 1071-4391 ISBN 978-1-906897-23-9

Location-based virtual interventions

Transcending space through mobile augmented reality as a field for artistic creation

by

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ABSTRACT

Location-based virtual interventions provide a new field for artistic creation through the use of augmented reality technology for mobile electronic devices. *This field considers the possibility of transcending the physical and territorial boundaries of a real space as axes of a new kind of artistic work which re-conceptualizes urban, rural, public and private spaces in terms of virtual content, and vice versa. In addition, this new configuration of a hybrid space (real/virtual) allows for the questioning of spaces of art legitimation and positions of power, their history and access to them. In accounting for these new possibilities, a description will be provided of previous virtual reality experiences, fixed augmented reality, and the beginning of mobile augmented reality; those will be compared to the current situation of massive mobile devices and ubiquitous services. Taking into consideration the work of international artists and my personal experiences using this technology with aesthetic purposes, I will describe a very recent scenario of electronic arts.*

I. INTRODUCTION

In the last few years, mobile devices, like smartphones and tablets, have become small laptops which move together with the subject who carries them; he/she has the possibility of using these devices "while" the relocation is performed. The user interacts, not only with mobile networks, but also with Internet, Global Positioning Systems (GPS), takes photographs and creates video, alowing them to visualize the world around them. S/he is also able to eventually access virtual content which connect the informational world of data to the real geographical space.

The boom of the Internet in the last twenty years and the production of specific content for the Internet assume a virtual, immaterial and untranscending character of a particular localization; all this from the point of view both of the creator and the spectator/consumer/user. Internet content is accessible to all in, anytime, anywhere and exactly the same for everyone. This characteristic, which might be pointed as one of the most interesting aspects of the Internet towards the democratization of information, also creates a disconnection from the sense of "place" and the perception of what the term "local" means.

The Internet virtual world, which so far had been portrayed as a separate, parallel cartography with no points of contact with the real world, can now start to be linked directly to material and physical space by means of mobile augmented reality technology.

In the artistic field, the relationship of a work of art with the specific space where it is exhibited has been explored by the Soviet constructivist movement since the beginnings of the twentieth century; it is also displayed in the different forms of sculpture in the expanded field, such as installations, interventions and land-art. At the same time, we might also consider the Latin-American mural painting movement and current urban interventions with stencils or graffiti as more direct access predecessors to works and interventions in non-authorized spaces.

As we mentioned before, in the particular field of electronic art, virtual creations generally established themselves as a world disconnected from real space. Through the technical possibilities provided by new mobile electronic devices and the use of augmented reality applications, both worlds can now connect to each other, and can be accessed in a massive and decentralized way.

This new field, named "electronically augmented spaces" by Lev Manovich, [1] translates physical spaces into data: information is extracted using surveillance and monitoring mechanisms, and then they are augmented with data and information, generally through screens. Creating tension between these two elements and overlaying virtual information over the real view of physical space (depending on the position of the spectator/user), it is possible to produce what Manovich called the "poetics of augmented space."

In connection to this, we will analyze in detail some productions which propose subversion of physical laws (gravity, mobility, size) and property laws (territorial, access control, copyright) through a virtual intervention linked to the place where its is located in physical space.

ISSN 1071-4391 ISBN 978-1-906897-23-9
ISSN 1071-4391 ISBN 978-1-906897-23-9

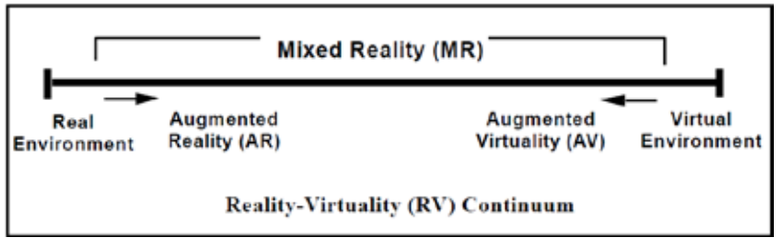

Image 1. Simplified drawing of the different virtuality levels. Included in "Augmented Reality: A class of displays on the reality-virtuality continuum." Image courtesy of Paul Milgram. All rights reserved.

On the basis of the various levels of virtuality classified by Milgram, Takemura, Utsumi and Kishino, [2] our research will first clarify the technical and conceptual differences between the Virtual Environment and Augmented Reality. Based on the characteristics of each level, some examples will be provided of electronic art works which have used those systems. We will then move forward to analyze the new possibilities arising from the use of mobile augmented reality technology compared to those mentioned above.

II. VIRTUAL REALITY: THE WORLD IN THE CAVE

If we are to narrow down our definition of virtuality and mixed spaces, we can take one of the better known concepts in the field of virtual works: virtual reality.

Although this concept can be related to Plato and his premises on the different levels of reality and the world of Ideas, as well as his celebrated "Allegory of the Cave," it has a much more recent history. Antonin Artaud uses this term in his 1932 book *The Theater and its Double* [4] when he refers to the identity of the characters, objects, images and everything which composes the virtual reality of theater in connection with the alchemical spirit. However, it is in the late 1980s and during the 1990s that this expression will be associated with an interface "that uses computers and human-computer interfaces to create the effect of a three-dimensional world in which the user interacts directly with virtual objects." [5] We can mention some developments in this sense: the 1956 "Sensorama" system by Morton Heilig, the head-mounted display (HMD) "Headsight" by C. Comeau and J. Bryan at Philco Corporation during 1961, the electronic flight simulators in England and the U.S. as from the 1970s, the "Sayre Glove" by R. Sayre, D. Sandin, and T. DeFanti in 1977 with its following versions like the "Digital Data Entry Glove" by G. Grimes in Bell Labs, or the "DataGlove" by T. Zimmerman, and the virtual reality immersion system "CAVE" launched in 1992. All this in addition to commercial use by Jaron Lanier, films like "Tron" (1982), the concept of Holodeck in "Star Trek," and fiction books like "Neuromancer" by William Gibson and "Lawnmover" by Stephen King. [6] [7] [8] [9]

We will identify the features of the CAVE system as one of the paradigmatic developments in this sense to differentiate it from those systems of augmented reality which will be described later. Here the user is inside a space with stereoscopic contents projected on three of the walls and the floor; they modify following the movements of the user's body to simulate immersion in a three-dimensional virtual space.

Image 2. CAVE (CAVE Automatic Virtual Environment) system. Image on the right is of public domain. Image on the left is courtesy of Advanced Visualization Lab, Pervasive Technology Institute at Indiana University. All rights reserved.

The evident intention is to generate a "simulation" of reality, in human perceptive time, especially through sight and interaction. This always occurs in a limited, monitored real space within the three walls, and by means of cables which reduce mobility to the boundaries of the screens. Virtual space is entirely disconnected from real space; in fact, the surfaces where the projections are displayed block the sight beyond the images. The purpose is precisely to lose track of physical space where, in turn, the illusion is created. This is one of the great differences in connection to what we will call "augmented reality."

For the artistic world, the possibilities offered by virtual reality were of great interest since its first inception. This could be due to, what the artist and theorist Jeffrey Shaw claimed: "The traditional activity of art has been the representation of reality – manipulating materials to create tangible mirrors of our experience and desire. Now with the mechanisms of the new digital technologies, the artwork can become itself a simulation of reality – an immaterial digital structure encompassing synthetic spaces which we can literally enter." [10]

In 1975 Myron Krueger created the first version of *Videoplace*, where through cameras and video projectors people in different rooms shared a virtual space that was projected on a screen; their bodies became colored silhouettes interacting with the rest of the participants in real time. A second version of the work was produced in 1984 where Krueger included a process of analysis and recognition of images to create more complex interactions among the spectators' movements and some graphics displayed in the virtual space on the screen. [11]

Another iconic work in virtual reality systems was *The Legible City* (1989) by Jeffrey Shaw. A user navigates around a three-dimensional virtual city made up of words through an interface similar to a bike. The course of the simulation is controlled with the speed of riding and the direction of the handlebars.

The idea of immersion was a big part of the goal in the development of systems and interest of artists which worked with virtual reality, and provides as a reference the analysis of Oliver Grau. [12] Immersion is one of the possible lines to working with virtual creations, and maybe the counterpart of what we will analyze in this paper. In other words, the dream of a virtual simulation notion through computer systems builds its illusion upon the denial of the physical space where it is being performed.

Image 3. *Inverter la terre, 1986,* Jeffrey Shaw. Museum of Science and Industry, La Villette, Paris, France. © Jeffrey Shaw. All rights reserved.

This is why a previous piece by Jeffrey Shaw named *Inventer la Terre* (1986) may turn out to be more interesting to us. In this case, one of the possible views when the spectator watched through the metal column (a sort of periscope) was the (optical) real direct image of the museum with an overlaying virtual image through an optical simulation; this created the sense of coexistence among the virtual objects and the physical space.

III. FIXED AUGMENTED REALITY: FROM ENGINEERING TO ART

One of the key moments in the beginning of augmented reality technology is the development by Ivan Sutherland of the Head-mounted Display in 1968. [13] This helmet was used at the same time to watch the "real" space in which the user was located (exactly as it would be seen without the helmet) and overlaying 'virtual' contents, depending on the point of view and the subject's movements.

Image 4. *Head Mounted Display,* 1968, Ivan Sutherland. Screenshots from video documentation. © Ivan Sutherland.

ISSN 1071-4391 ISBN 978-1-906897-23-9
ISSN 1071-4391 ISBN 978-1-906897-23-9

Some years before, in 1965, Ivan Sutherland himself had presented in his famous "The Ultimate Display" [14] the idea of mixing virtual contents with "real" physical spaces. He proposed an interface layout which intended to associate the virtual with the real world to the point where a virtual bullet would impact the real user's body, killing him/her.

The development of this kind of technology gained new momentum with the experiments of Tom Caudell and David Mizell at the Boeing company, published in 1992, when the term "augmented reality" is coined. [15] In this case, augmented reality was applied to the assistance of workers in a highly complex task as the manual assembly of thousands of cables during the manufacturing of commercial airplanes.

Image 5. *The Golden Calf*, 1994, Jeffrey Shaw. Ars Electronica, Linz, Austria. © Jeffrey Shaw. All rights reserved.

In the art field, one of the first projects that used augmented reality technology was *The Golden Calf* (1994) by Jeffrey Shaw, creating the virtual model of a "golden calf." This calf could only be seen through a screen overlaying the virtual model over a real-time view of the built-in camera; this created the illusion that the virtual object was lying on a platform, depending on the movements of the screen you could watch it from several points of view. This situation generated tension between what our eyes were seeing in that space which was only a platform of empty exposition, and a screen which displayed an object lying on that same platform.

The Golden Calf project, which pioneered the augmented reality technology from an aesthetic point of view (as well as Sutherland's, Caudell's and Mizell's developments in engineering), requires that the display be physically connected (with cables) to an electronic device generating real-time virtual information according to the position of the screen; but the display cannot go beyond the boundaries of the cable length nor function without the physical transportation of the device which supports the illusion. This shows that despite this work pioneering in the deployment of this technology, there are still far more possibilities when we think of the use of current mobile electronic devices; especially in delivering software through the Internet which can run on this type of devices, whatever their geographical location might be, since it is not necessary to physically carry a particular artifact to visualize it.

Nowadays, thanks to the massification of smartphones and tablets, augmented reality systems can be deployed without the aid of special hardware, making it possible to move freely through space nearly anywhere in the world.

This new phase of augmented reality technology which incorporates mobility and massification seems to open a new field for content creation; we will address in particular those contents related to aesthetic virtual production in terms of a specific site.

ISSN 1071-4391 ISBN 978-1-906897-23-9

IV. MOBILE AUGMENTED REALITY: UBIQUITY

The first experiences of mobile augmented reality are nearer in time as they need a mobile technological platform which could integrate data processing (a computer), a friendly entry interface (touch-sensitive and the motion sensors in the device) and an output interface (mobile display, for the head or the retina), geo-positioning, in many cases wireless data connection (to the Internet or other network), as well as the power necessary for all these elements to operate for a reasonable amount of time.

Although these elements were not integrated into mobile devices nor were introduced to the market massively until thethe twenty first century. In 1996 Steve Feiner and some colleagues created one of the first research and development projects which intended to achieve this: the MARS (Mobile Augmented Reality Systems) system. During their first year of work, they were able to create a functional prototype: "The Touring Machine." [16] This prototype was used to watch information on different points in the campus of the University of Columbia while a subject toured around within the perimeter. The equipment consisted of a backpack with a notebook which apart from having a graphic card for 3D images processing, included GPS data, a handheld PC connected by a wireless modem to the University network and a see-through head-worn display which allowed the view of reality with overlaying digital information.

Image 6. First prototype of the MARS (Mobile Augmented Reality System) system. 1997, © Steven Feiner, Blair MacIntyre, Tobias Hollerer, and Anthony Webster, Columbia University. All rights reserved.

Despite isolated attempts like Nokia's MARA (Mobile Augmented Reality Applications) project in 2006, [17] it is not until mass-marketing of smartphones during the past three years that we can talk about aesthetic and content production in terms of mobile augmented reality. This is especially so because for different reasons – which in my view have nothing to do with augmented reality – we are eventually presented with a palm-sized mobile electronic device which has all the technical requirements demanded by augmented reality. In other words, the conjunction of a small computer (powerful microprocessor, considerable amount of memory), touch screen, GPS and movement sensors (accelerometers), video camera and Internet connection (Wi-Fi, 3G or 4G) in the hands of an increasing number of people. Allowing for the visualization of aesthetic searches through the use of mobile augmented reality. This is comparable to the massification of the Internet in the middle of the 1990s and the first experiences of Net.art exploring a space without strict surveillance and legal regulations.

One of the turning points in the creation of contents from fixed augmented reality towards mobile devices, as well as a development that might be placed both in the engineering and aesthetic fields, is *The Invisible Train* (2004) by Daniel Wagner, Thomas Pintaric and Dieter Schmalstieg.

Their project consists of an application for personal digital assistants (PDA) which alows multiple users to control a virtual train running along a real prototype with a railway pattern. Users have to prevent trains from colliding by adjusting the speed of each virtual convoy.

ISSN 1071-4391 ISBN 978-1-906897-23-9

Image 7. *The Invisible Train*, 2004, Daniel Wagner, Thomas Pintaric and Dieter Schmalstieg. Courtesy of Vienna University of Technology.

Proposing the use of an augmented reality system within a standard mobile device marks the beginning of a growing tendency which would continue during the following years through the fusion of so-called PDAs and mobile phones into smartphones with the hardware needed to implement those systems. As these devices became more popular, new platforms were introduced, like *Wikitude* (2008) or *Layar* (2009), which were used to create augmented reality contents for various operating systems. For instance, a work created with Layar can now be accessed from Android, iOS, Blackberry and Symbian. Compatibility generated by these platforms simplifies programming through content creation, as well as reaching a greater number of users. Therefore, since around 2010, any user with an intermediate knowledge of programming (especially PHP and SQL) is able to use those platforms to create his/her own content which can later be visualized by a considerable audience.

Moreover, these massive delivery possibilities exist thanks to the ubiquitous nature of current mobile devices in terms of permanent wireless Internet services. Devices are permanently connected either through the cellular network or local access points, so it is possible to access mobile augmented reality systems and visualize their content overlaying the environment.

V. VIRTUAL INTERVENTIONS FOR MOBILE DEVICES

Processing capacity of mobile electronic devices, standardization of their operating systems, and the development of online software platforms for simplified augmented reality content creation gave rise to a series of aesthetic creations using these technologies. This might be considered as a new aesthetic field that we will call "location-based virtual interventions."

This type of technologies is necessarily related to the traditional artistic use of space, from sculpture and architecture to land-art and installations. They present, however, two distinguishing fundamental elements: the objects created are virtual and, thus, are not affected by gravity; it is also possible to place them anywhere in the world, whether a private or public space, with or without permission.

The most interesting works in the field of mobile augmented reality are precisely those which leverage the following two features: location of the virtual object establishing tension with the real space, and/or limit transgression of real materials by means of virtual immateriality. That is transcending space in two senses: on the one hand, real space where materials are not able to act in a particular way; on the other hand, control, territorial and property space.

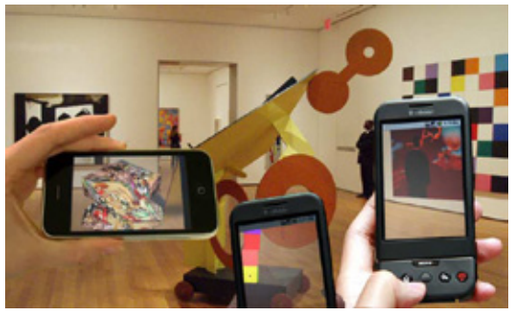

Image 8. *We are in MoMA,* 2010, Sander Veenhof and Mark Skwarek. Image courtesy of Sander Veerhof.

The group of artists Manifest.AR has created art works which constantly address spatial aspects of control, power and art legitimation. For example, in *We are in MoMA* (2010) Sander Veenhof and Mark Skwarek used the Layar platform to infiltrate a series of virtual objects in the space assigned to the building of the Museum of Modern Art in New York. This same group also launched at the Venice Biennal 2011 a series of virtual pavilions with various works at the central, and therefore, the most sought-after spot, the "Giardini" at Piazza San Marco. Among the set of virtual works included at the Biennal, one in particular is of special interest in terms of consideration over its own condition – the *Shades of Absence* by Tamiko Thiel. This work presents yellow silhouettes and virtual typography with words alluding to censorship; by clicking on the screen, we access a list of artists' names whose artworks at public spaces have been censored.

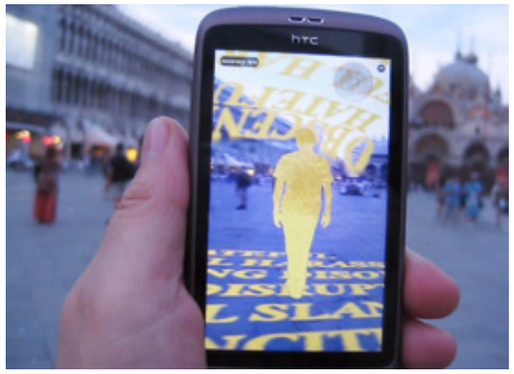

Image 9. *Shades of Absence: Public Voids,* 2011, Tamiko Thiel, Augmented Reality, Video still © Tamiko Thiel.

Public spaces; art exhibition spaces; legitimation, power, and controlled spaces. Public, private, guest, excluded and censored artworks – these elements which for centuries have been present in the art world, start intersecting. From rupestrian paintings placed in poorly accessible places to current urban graffiti, through religious images in churches or the Latin-American mural paintings, what differentiates them all is that these referents address those elements through pure materiality. There is a painting, a sculpture or an object in a real space. In the 1990s, those same elements were challenged through net.art virtuality, but nowadays there is a new range of possibilities regarding the connection of the immateriality of virtual objects with physical-real spaces. We could argue that if Internet cyberspace is as controlled as the physical-real space, then the conjunction of the Internet and the material space creates a yet unregulated new hybrid world; this, in turn, allows certain practices which violate the laws and controls of the two spaces where the hybrid space is supported.

Considering that one of the most interesting points in virtual interventions is the possibility of using space without surveillance "inside" a particular location, there is another aspect to explore in terms of immateriality and dimensions of the created objects. We are also faced with the possibility to transcend the three-dimensions of any material physical object, its location and dimensions; an example of this is Sander Veenhof's work *1px* (2011) which consists of the minimum possible expression of augmented reality data; another one is *Biggar* (2010) where the artist shows the biggest interactive virtual sculpture in the world: 7 billion objects placed around the Earth.

Objects might be three-dimensional, ecstatic, or mobile, and there might be images, sounds, videos or texts. Although they can be modified according to other settings or sensors, they will build an augmented space which allows to perceive the real space in a different way, and to re-conceptualize digital virtual creations. Whether through the transgression of placing an artwork at some place without permission, or the construction of shapes which would be impossible to achieve in the real world, the way we connect to the aesthetic contents of mobile augmented reality depends on an alternative use of mobile electronic devices, space and experiences in proposed paths. In this way, political, ideological and philosophical readings are created through location-based virtual interventions.

VI. VIRTUAL INTERVENTIONS FROM ARGENTINA

From these experiences in the U.S. and Europe, we might argue that placing content without permission implies a critical questioning of surveillance spaces in the mechanisms of contemporary art legitimation. But at the same time, these centers of power are ratified when choosing the sites to intervene. For in these cases, the artwork can only be experienced by those who are able to travel to cities like New York or Venice, to name a few examples.

ISSN 1071-4391 ISBN 978-1-906897-23-9
ISSN 1071-4391 ISBN 978-1-906897-23-9

Image 10. *Untitled (site-specific ubicuity),* 2011, Alejandro Schianchi, virtual intervention, Creative Commons CC-BY Alejandro Schianchi. In Galerias Pacífico (Buenos Aires, Argentina) with the virtual content and the backgound of a mural made by latin-americans painters.

On the basis of this situation and my location in Buenos Aires, Argentina, I thought it should be somehow possible to go deep inside the political aspect of location-based virtual interventions. This is the origin of my work *Untitled (site-specific ubiquity) (*2011) consisting of an abstract, three-dimensional, open-source generated object which can be downloaded and modified. This work is placed in different spaces in the world, such as galleries, museums and cultural centers in Buenos Aires, as well as legitimate sites abroad, the Pompidou Centre (Paris), the Guggenheim Museum (New York), and ZKM (Karlsruhe). In this way, a citizen from Buenos Aires can experience exactly the same artwork as a Parisian – since the model is the same – , but each one will observe it from his/her own local environment. Legitimation arising from placing an artwork at international power spaces, without permission and at no relocation costs whatsoever, is somehow re-conceptualized through access to the same work and at the same time in the rest of the world. The issue of performing an intervention in a given territory from abroad inevitably results in a series of different relationships from those established by a local intervention; this is deepened when there are economic, political and social distances between both territories. In addition, the intention is to multiply the locations of the object as the artwork is presented at different events, as was recently the case in Paço das Artes (San Pablo) during the Arte.Mov festival; it could also be presented at a different site without the author's control through appropriation of the code.

Another location-based virtual intervention at Buenos Aires is *Video Dérive* (2011) which shows a series of video clips placed in different points of the city's downtown. These videos – recorded indoors and outdoors, close to and far from those points – can be played as the user walks along the city.

ISSN 1071-4391 ISBN 978-1-906897-23-9

Image 11. *Video Dérive*, 2011, Alejandro Schianchi, Virtual intervention, Creative Commons CC-BY Alejandro Schianchi. Watching one of the located videos in the same street that was recorded.

Video playback and the decision to walk along with the movements displayed develop diverse relationships between the user's context and the content watched from the mobile device screen. Differences and coincidences in space, time, elements and movements are created in a kind of spatial, audiovisual hypertext which is explored as the user tours around the streets of Buenos Aires. Users can even make a call to my personal mobile phone. Formats, roles and connections are intertwined between the author and the user, between fiction and documentary. We talk about fiction because in several of the clips that make up the work, the user always watches and follows the same character. Ultimately, this is a way of exploring urban space without a definite target, accessing the various video clips depending on the chosen journey.

VII. VIRTUAL INTERVENTION IN THE ARGENTINEAN PAMPA PLAINS

The transgressions of space, relative to physical and control limits through mobile augmented reality, which are mentioned in this paper can be articulated with the project I am currently developing.

This work consists of the virtual placement of a large-sized horizontal plane of 650 km long and 10 km wide over a territory of the Argentinean Pampas which was chosen for being particularly plain.

This virtual plane transcends physical boundaries in two senses, on the one hand for having two dimensions (no depth), and on the other hand, for being parallel to the ground without being in contact with it, nor subject to, the land, for example without experiencing the impact of gravity.

In this case, the questioning of the territory is related to the fact of trespassing thousands of private plots of

ISSN 1071-4391 ISBN 978-1-906897-23-9

land without permission. It promotes reflection upon the history of the land where the work is placed and its relationship with the use of wire fences.

Image 12. Virtual intervention project by Alejandro Schianchi in the Argentinian pampa region, Creative Commons CC-BY Alejandro Schianchi. Map view.

The first wire fences introduced in the country to identify the limits of the plots and, therefore, of private property were used in this region of extensive plains, where references are hard to find. *Gauchos* who moved freely through these lands in the beginnings of the 19th century started to find restrictions which would become increasingly widespread.

The virtual plane connects to this history by transcending the plots of land divided and allocated to landholders. By use of location-based virtual intervention, it is possible to create a conceptual and aesthetic connection between real space and virtual space. This is portrayed in an artwork which cuts across rural and urban spaces into the Río de la Plata.

The work also seeks to restore part of the *rioplatense* artistic tradition: from Lucio Fontana's spatial concept to Marcel Duchamp's production (reference) during his stay in Buenos Aires.

Image 13. Virtual intervention project by Alejandro Schianchi in the argentinian pampa region, Creative Commons CC-BY Alejandro Schianchi. Photomontage based on the image of Maximiliano Alba CC-BY-SA. Terrain view.

As for Lucio Fontana, the virtual plane may be seen as an incision into a section of space, although contrary to his notorious vertical slashes of the canvas, with a horizontal cut. Immateriality of work could be reflected in the premise of his "Television Manifesto of Spatial Movement" (1952) to create art which is "disconnected from the material;" through Jean-François Lyotard, [18] Paul Virilio, [19] and Peter Weibel [20] it will then be tightly connected to the subsequent tradition of electronic art.

In the case of Marcel Duchamp, while staying in Buenos Aires for nearly a year, he produced a stereoscopic piece, placing the segments of two opposing pyramids over the horizon of the Río de la Plata. His work *Stéréoscopie à la main* (1918) represents the conjunction of an abstract geometrical shape and a real space, which evidently called the French artist's attention. The flat horizon is characteristic of Buenos Aires perimeter; the plains extend into the provinces of La Pampa and Santa Fe in the Northwest, and into the East following the Río de la Plata river, setting up a very particular landscape which has served as inspiration to great part of the local art history and through which this location-based virtual intervention tries to establish a dialogue.

CONCLUSION

Mobile technologies allow for reflection upon the spaces revised in terms of artistic practices, creating a new point of contact between the virtual cartographies of telecommunications and data networks, and of a nomad body moving with augmented mobility through ubiquitous mediatisations.

A new territorialisation for visualizing immaterial data in real space is produced, as well as a connection between cyberspace and physical mobility, between global access and local experience.

Based on the above-mentioned examples, it is possible to see that this as a new, expanding aesthetic field and, therefore, lacks previous academic references. It is seen, however, as an important point for debate and of interest to the current electronic art field.

We have, then, reflected upon a new aesthetic field through space transgressions performed by location-based virtual interventions which will probably multiply along with the massification of mobile electronic devices and data connection systems ubiquity. ■

ACKNOWLEDGEMENTS

This article is dedicated to the friendship and memory of Norberto Griffa. His spirit still inspires me. I must also acknowledge Dr. Laurence Bender for his valuable suggestions, Professor Jorge Zuzulich for his interest in this subject, Dr. Pablo Jacovkis for his comments and Mariana Pierantoni for her collaboration.

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 ISSN 1071-4391 ISBN 978-1-906897-23-9

ALEJANDRO SCHIANCHI

interviewed by

Lanfranco Aceti & Richard Rinehart

Is there an 'outside' of the Art World from which to launch critiques and interventions? If so, what is the border that defines outside from inside? If it is not possible to define a border, then what constitutes an intervention and is it possible to be and act as an outsider of the art world? Or are there only different positions within the Art World and a series of positions to take that fulfill ideological parameters and promotional marketing and branding techniques to access the fine art world from an oppositional, and at times confrontational, standpoint?

The 'outside' concept of the art world is always present when you create artwork in a country like Argentina, especially since our cultural tradition has been based on the observation of what is going on in the European and American 'sources of legitimation.' I think it is in this respect that you might draw a border that defines 'outside' from 'inside.' Some institutions, museums and galleries set trends and legitimate certain artists and artwork because others, in turn, validate those spaces of legitimation, and in such a way the border is defined. This happens in my country and in many others, where you are much more renowned for an exhibition in the MoMA or the Tate than for the artwork you might display at a museum in Buenos Aires or South Africa. This is related to the several contributions of Lyotard's theory on postmodernism to the process of knowing how contemporary legitimacy works.

From this (conceptual and geographical) point of view, I believe that an intervention which has not been validated by those 'sources' might be considered as a more powerful and hegemonic action from the outside to the inside of art world. This is why I find virtual interventions so interesting, as they can be performed remotely and at low cost from the 'outside' to the 'inside.'

I feel that saying this seems to go against an idea which is precisely promoted by these 'sources of legitimation,' and which is mentioned in your question, about the so-called democratization of the art world – a much more horizontal positions-taking that art institutions adopt neither without being clearly outside nor inside 'something.' This reminds me of what André Lemos says in connection with a supposedly equal access to the Internet in his claim that "Those who can move more easily through cyberspace are also those which are more autonomous to physically move, and vice versa." We might add that those who can move more easily both through cyberspace and the physical world are certainly closer to the 'inside' of the art world.

"In *The Truth in Painting*, Derrida describes the *parergon* (*par-*, around; *ergon*, the work), the boundaries or limits of a work of art. Philosophers from Plato to Hegel, Kant, Husserl, and Heidegger debated the limits of the intrinsic and extrinsic, the inside and outside of the art object." (Anne Friedberg, *The Virtual Window: From Alberti to Microsoft* (Cambridge, MA: MIT Press, 2009), 13.) Where then is the inside and outside of the virtual artwork? Is the artist's 'hand' still inside the artistic process in the production of virtual art or has it become an irrelevant concept abandoned outside the creative process of virtual artworks?

In my case, the production of virtual art has always been connected to the possibilities raised by its immateriality from the perspective of conceptual art tradi-

ISSN 1071-4391 ISBN 978-1-906897-23-9

tion. When an artwork is based on automatic processes, or processes which require little intervention from the artist, his/her 'hand' is largely displaced. For me this is personal research into certain features of virtual devices, but this may not necessarily be the case of all virtual artworks. I think that in many other works, the artist's hand is directly present in the gestures carried into the virtual world, but also in a more indirect way by virtue of what we may call style. Whether you see it in the writing code decisions – in software-like works such as *Contagious Paranoia* (2001) by Eva and Franco Mattes or my experimental open-source audiovisual *Untitled* (2010) – where the artist considers variable names and aesthetics within the code structure that supports and is attached to the artwork; or in the aesthetic decisions regarding color, shape, size and movement of the virtual work that has been created, making use of a broader sense of the artist's hand inside the artistic process.

Ultimately, there are always a number of decisions to be made by the artist, which will account for his/her 'hand' in the process. I am therefore outraged at the indiscriminate use of random functions in digital artwork, where the artist's decision is eventually reduced to the milliseconds of the execution system and there is no accountability for the decision on his/her part. This is what has led me to explore error as an aesthetic possibility in audiovisual devices, since I understand that, under those circumstances, there is a much more evident displacement of the artist's hand and decisions in favor of those of the device which is not responding as expected.

In short, I think that if there is indeed some sort of displacement of the artists' hand, this is not as much due to the very nature of the device, but rather to the fact, as explained by Vilém Flusser, that they have become functionaries of the hardware/software used for their production.

The 'inside' and the 'outside' limits of virtual productions are hard to place because, as Dubois claims, they build their own reality. However, we may imagine a border where the real world should support information for the virtual world to exist. Hard disks, solid-state memories, capacitors, and punched cards – the material support for simulation might be considered as the 'outside,' whereas the result of that virtual simulation might be considered as the 'inside.' In my work *Untitled* (2009), where I rebuild Kosuth's *One and Three Chairs* into a virtual multi-user world (Second Life), I play with the traditional border of artwork, since it is a virtual space where the virtual artwork is supported by another virtual system.

The interesting thing is that virtual interventions with augmented reality allow us to include the real world, which makes virtual illusion possible. This invalidates the difference described above and presents a hybrid world (real/virtual) where it is more difficult to set the border between 'inside' and 'outside.'

Virtual interventions appear to be the contemporary inheritance of Fluxus' artistic practices. Artists like Peter Weibel, Yayoi Kusama and Valie Export subverted traditional concepts of space and media through artistic interventions. What are the sources of inspiration and who are the artistic predecessors that you draw from for the conceptual and aesthetic frameworks of contemporary augmented reality interventions?

The Fluxus movement is an obviously important historical referent for creative output that connects art and life, as well as the traditional exhibition venues which are altered or extended into everyday public spaces. I would also mention other names like El Lissitzky, Gordon Matta Clark, Jenny Holzer and Jeffrey Shaw for both his works *Golden Calf* (1994) and *Inverter la terre* (1986), and Land Art made by Robert Smithson, and Christo and Jeanne-Claude for

ISSN 1071-4391 ISBN 978-1-906897-23-9

resignifying buildings or landscapes through interventions. I also think that graffiti art, through exemplary Bansky, has much to do with the attitude of virtual interventions, especially in those productions where the image is directly linked to the located space as his series performed in the wall that divides Israel and Palestine. From a theoretical point of view, I think Guy Debord is the most important reference, followed by Rosalind Krauss with her concept of "Sculpture in the Expanded field," Nicolas Bourriaud with his "Relational Aesthetics," and some concepts provided by Gilles Deleuze, such as "deterritorialization" and "reterritorialization"and his description of computerized societies in *Postscript on the Societies of Control*.

Regarding my particular style in virtual interventions, I find inspiration in many minimalist and conceptual artists: Richard Serra, Sol Lewitt, Donal Judd, Tony Smith, Robert Morris, Walter de Maria, Félix González-Torres. I also include traditional Latin-American mural paintings which depict social issues and exhibit to the general public, outside elitist artistic exhibition venues. Some artists are David Siqueiros, Diego Rivera, José Orozco, Antonio Berni, Leonardo Spilimbergo and Juan Carlos Castagnino. This is why I took interest in the virtual intervention through my work *Untitled (site-specific ubicuity)* (2011) of the dome at the Galerías Pacífico shopping mall, where we can find a mural painted by many of those artists. Some other Argentinean artists that have inspired me in terms of the intervention of galleries, museums and public spaces are Marta Minujín, David Lamelas, Alberto Greco, Nicolás García Uriburu and Horacio Zabala. In theoretical terms, the *Manifesto spaziale per la televizione* (1952) by Lucio Fontana is a forerunner in immaterial artistic creation.

For my latest virtual intervention, based in the Pampa plains, I found a connection with Marcel Duchamp's *Stereoscopie a la main* (1918), a work performed during his stay in Buenos Aires. This is an optical experiment where we can see an abstract geometric figure over the Río de la Plata river, combining the real world and a 'virtual' three-dimensional world.

In the representation and presentation of your artworks as being 'outside of' and 'extrinsic to' contemporary aesthetics why is it important that your projects are identified as art?

I don't think it is important that my projects should be considered art. I am interested by the tension itself between a virtual object not necessarily considered an artwork and some space which validates artistic productions. This is a sort of resignification of the 'ready-made' which inevitably goes beyond the art world and is rather connected with surveillance, monitoring, ownership, consumption, mass technology, communication and mobility issues. In this sense, *We are in MoMA* (2010) by the collective Manifest.AR provides us with an interesting example for reflecting upon the opportunities to challenge certain power spaces and art legitimation that arise from virtual interventions. In my case, through my work *Untitled (site-specific ubiquity)* (2011) I intended not only to place a virtual production in a legitimation space, but also to link it to some of the issues I mentioned before; first, by generating the virtual three-dimensional volume only through the code, and making it accessible to the public who are able to download it and modify it; and second, by placing the same object in different places, retrieving simple copy and reproduction possibilities opened up by digital devices. At the same time, it allows more people to access the experience of personally seeing the object through their own mobile device, without the need to be at a New York museum. I think this point reveals that Walter Benjamin's aura and reproducibility concepts are still valid and current, especially in regards to the political and social dimension in terms of massive access to an artwork. This is what has led me to think of virtual interventions not merely

ISSN 1071-4391 ISBN 978-1-906897-23-9

in the large international centers, like the Guggenheim and Centre Pompidou, but also in galleries, museums and public spaces in Buenos Aires.

On one hand I think that the conceptual and aesthetic implications of 'extrinsic to' something are amplified when an intervention is performed outside the borders of the artist's country of residence. Related to this, I am also attracted by this new field of virtual interventions which can be produced abroad, but is experienced at a local level.

On the other hand, when you are inside the art world a series of thoughts are developed which are specific to the art world. What I mean is that, if in order to do some critical thinking of the world, it has to be considered as art, then I think it's valid trying to have it regarded as such or as a means of delivering pleasure or, at least, of moving away from the advertising commercial or tourist interests suggested by most of the mobile augmented reality applications. So the work of art is related not as much to the romantic spirit of art as to a cultural strategy to stimulate critical thinking.

What has most surprised you about your recent artworks? What has occurred in your work that was outside of your intent, yet has since become an intrinsic part of the work?

Going back to watching the landscape, the place where I live and its surroundings, and noticing the differences between these places and some others far away. Going back to the 'here and now' awareness in the aesthetic experience, without dismissing the possibilities provided by digital and virtual productions.

The presence of all this was not so clear in my first work with mobile augmented reality, and it started to emerge in my second work. The first work, *Untitled (site-specific ubiquity)* (2011), focused on the opportunity of placing a virtual three-dimensional object anywhere in the world from a developing country, even inside the most important centers of art legitimation at a level of abstract spaces of power and control.

For my second work *Video Dérive* (2011), I wanted to experiment with video clips, so I started shooting in the surroundings of the place where I live, mainly for technical reasons such as defining the speed of connection, codec compression, etc. I found that carefully watching the territory where I move every day was critical to the process – searching for situations, images, spaces and sounds which might be connected to one another. Finally, an artwork which consists of short-length video clips located in different points in the city of Buenos Aires turns out to be some kind of multimedia hypertext in the real space, where depending on the viewer's circulation and interaction, different relations are developed between the content of the videos and their playback time and space. This experience, which forced me to see the relationship between space and audiovisual content, also helped me to reconnect with everyday local places, from my perspective as I had to choose what to record, and from the viewers' perspective as they walk along the streets watching a video which relates to the 'here and now.' All this has resulted in the latest production I am working on where I locate a virtual horizontal plane extending more than 600 km over the Argentinean Pampa plains. Reflecting on the history of private property limits in this area, when *gauchos* who moved freely over the land started to come across barbed wire fences which marked the perimeter of the lands. ■

ISSN 1071-4391 ISBN 978-1-906897-23-9

ALEJANDRO SCHIANCHI

statement & artwork

My artworks frequently portray some tension between their aesthetic and technological aspects; there is usually an electric, electronic, digital device or mechanism which sustains an illusion.

This illusion intends to exert some effect on the viewer's senses and, particularly, some thinking process.

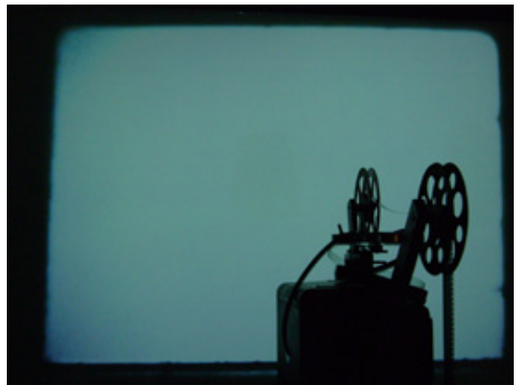
Stressing the limits and possibilities of each device, I look for virtual or real images, sounds and objects which come to a crisis with their condition; representation and virtuality issues, errors in apparatus, are all traversed by a resignification of concepts.

Due to my technical background in computer electronics and my aesthetic background in cinematography, I have always had a great interest in developing and linking both fields. I originally put this idea into action through videos, nourished by the migration from celluloid to digital format in cinema in the late 1990s, and through the massification of computers and the Internet.

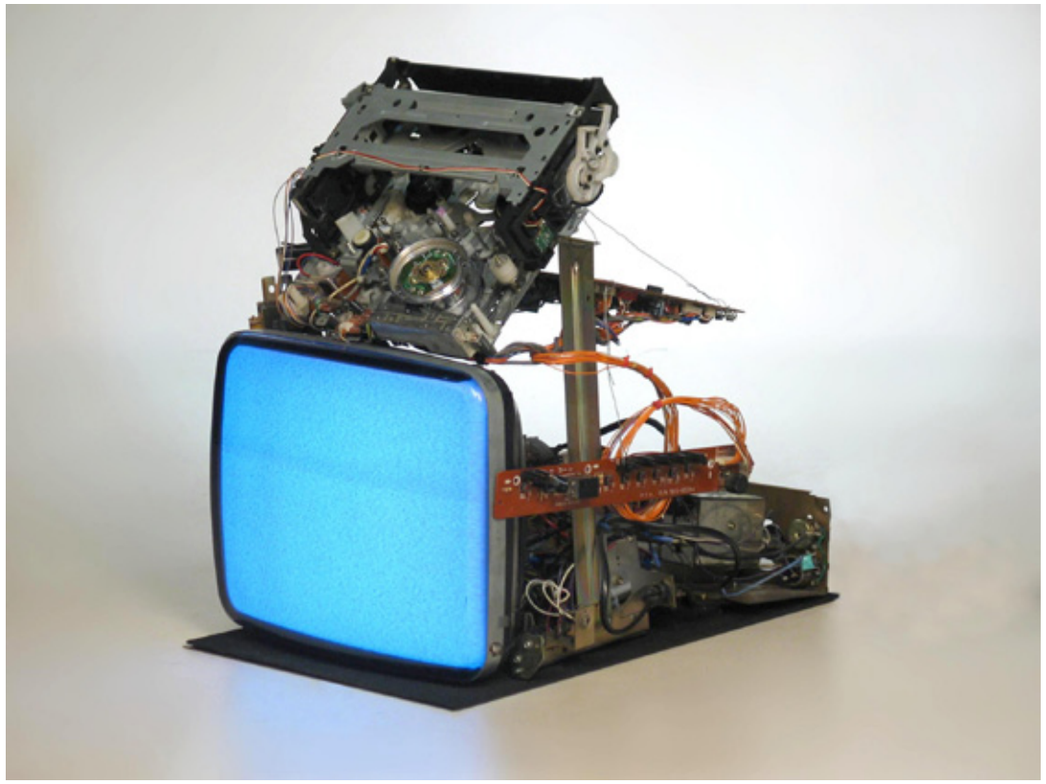
A couple of years later, I started producing objects and installations because I felt the need to explore spatial situations which were otherwise limited in plain images. In the last years I start working on multi-user virtual worlds and combining it with the real world, which has led me to carry out research on the field of mobile augmented reality.

Untitled, 2001, Alejandro Schianchi, digital video, Creative Commons CC-BY Alejandro Schianchi. Digitized Lumiere brother's film.

Given the conceptual nature of my production, together with my academic activity, I understand that theoretical production is as important as the execution of artwork, in virtue of an intellectual process worthy of causing aesthetic, technological, social and philosophical concerns which will be connected to and reinforced by art production. ■



Untitled, 2002, Alejandro Schianchi, 16 mm., Creative Commons CC-BY Maximiliano Schianchi. Fade from black to white in ten minutes.



Untitled, 2006, Alejandro Schianchi, video object. Copyright Gianni Mestichelli. An image of the argentinian dictator Videla is erased through time.

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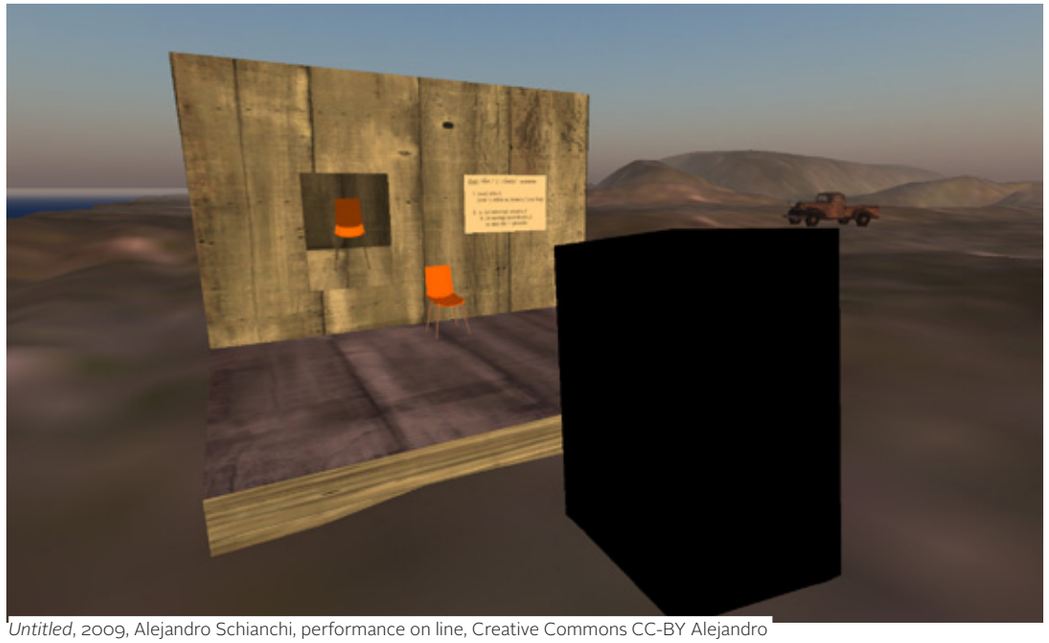

Untitled, 2009, Alejandro Schianchi, performance on line, Creative Commons CC-BY Alejandro Schianchi. Virtual version of Kosuth's "One and three virtual chairs."

Untitled, 2009, Alejandro Schianchi, installation, Creative Commons CC-BY Alejandro Schianchi. Installation version with a photo of the Kosuth work, a video projection, and a mirror.

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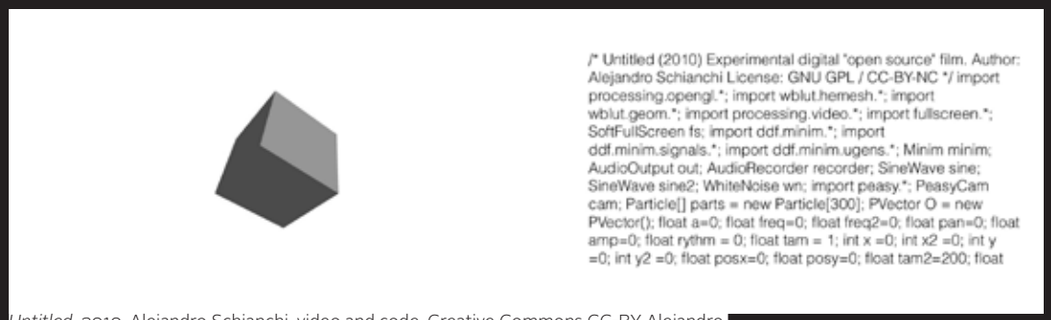
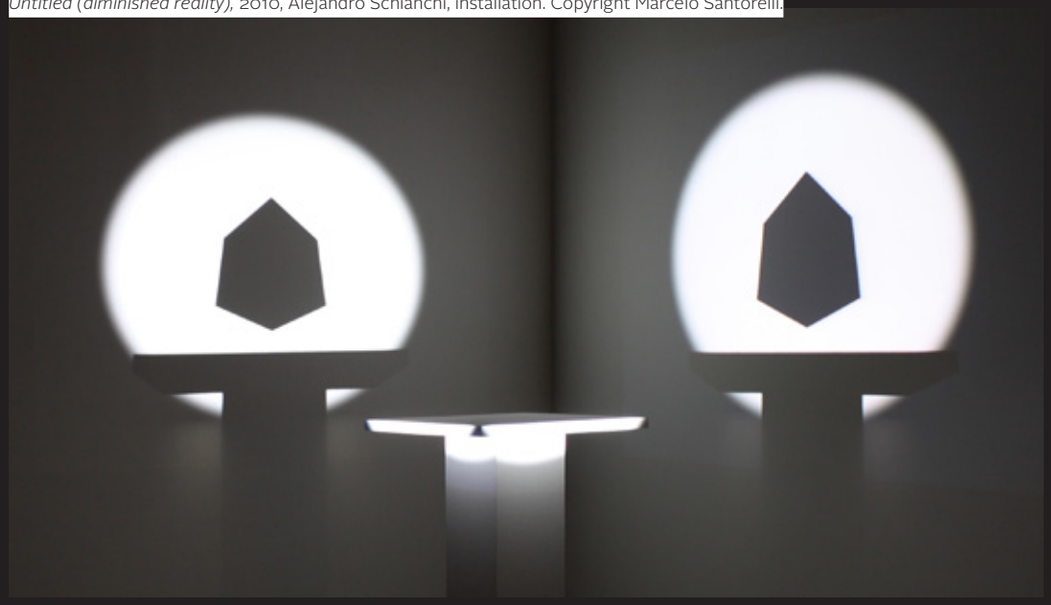


Untitled, 2010, Alejandro Schianchi, video and code, Creative Commons CC-BY Alejandro Schianchi. The video is generated only by an open-source code.

Untitled (diminished reality), 2010, Alejandro Schianchi, installation. Copyright Marcelo Santorelli.



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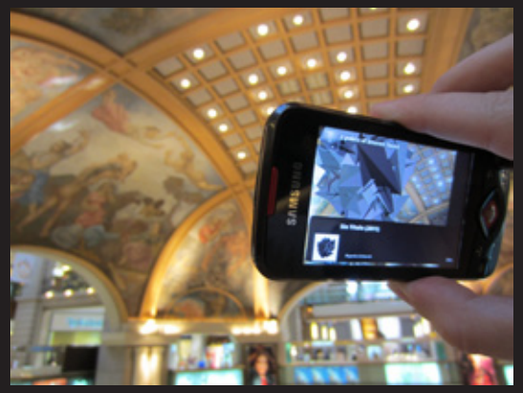
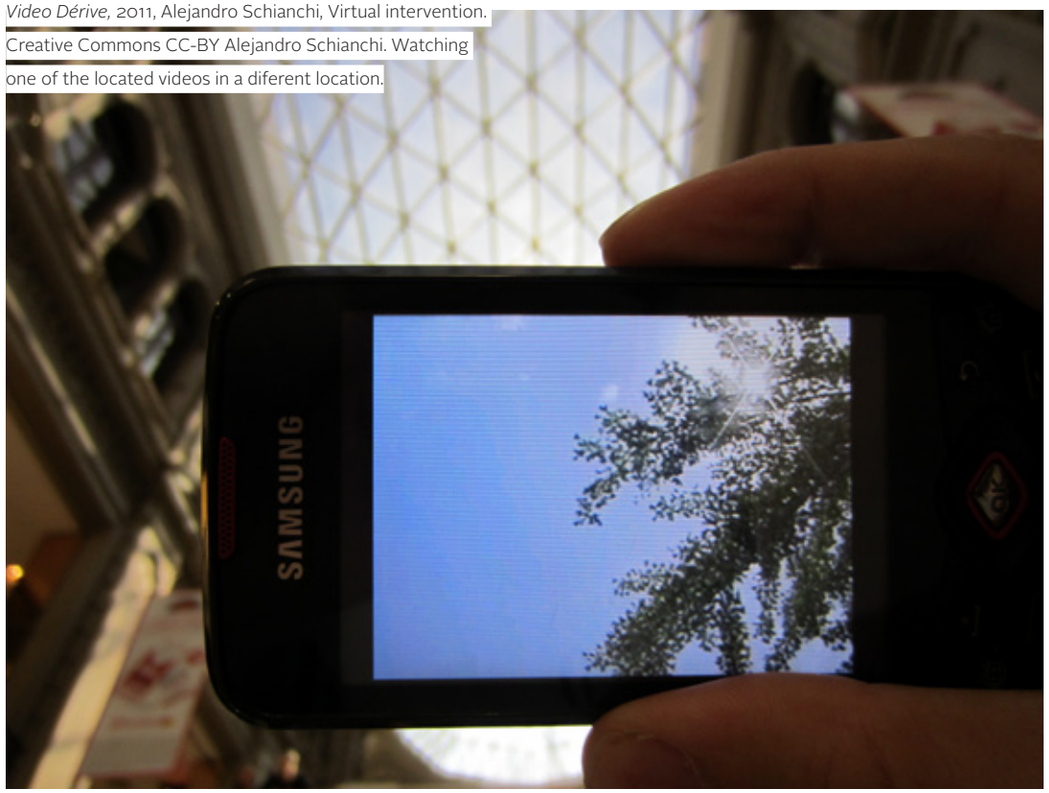


Untitled (site-specific ubicuity), 2011, Alejandro Schianchi. Virtual intervention, Creative Commons CC-BY Alejandro Schianchi. In Galerias Pacífico (Buenos Aires, Argentina) with the virtual content and the background of a mural made by latin-americans painters.

Untitled (site-specific ubicuity), 2011, Alejandro Schianchi. Virtual intervention, Creative Commons CC-BY Alejandro Schianchi. The virtual object located in the Guggenheim Museum, New York. Photomontage based on the image of Matt Olson CC-BY-SA.

Untitled (site-specific ubicuity), 2011, Alejandro Schianchi. Virtual intervention, Creative Commons CC-BY Alejandro Schianchi. A street in Buenos Aires with the virtual content near a cultural center in Buenos Aires, Argentina.

Video Dérive, 2011, Alejandro Schianchi, Virtual intervention. Creative Commons CC-BY Alejandro Schianchi. Watching one of the located videos in a diferent location.



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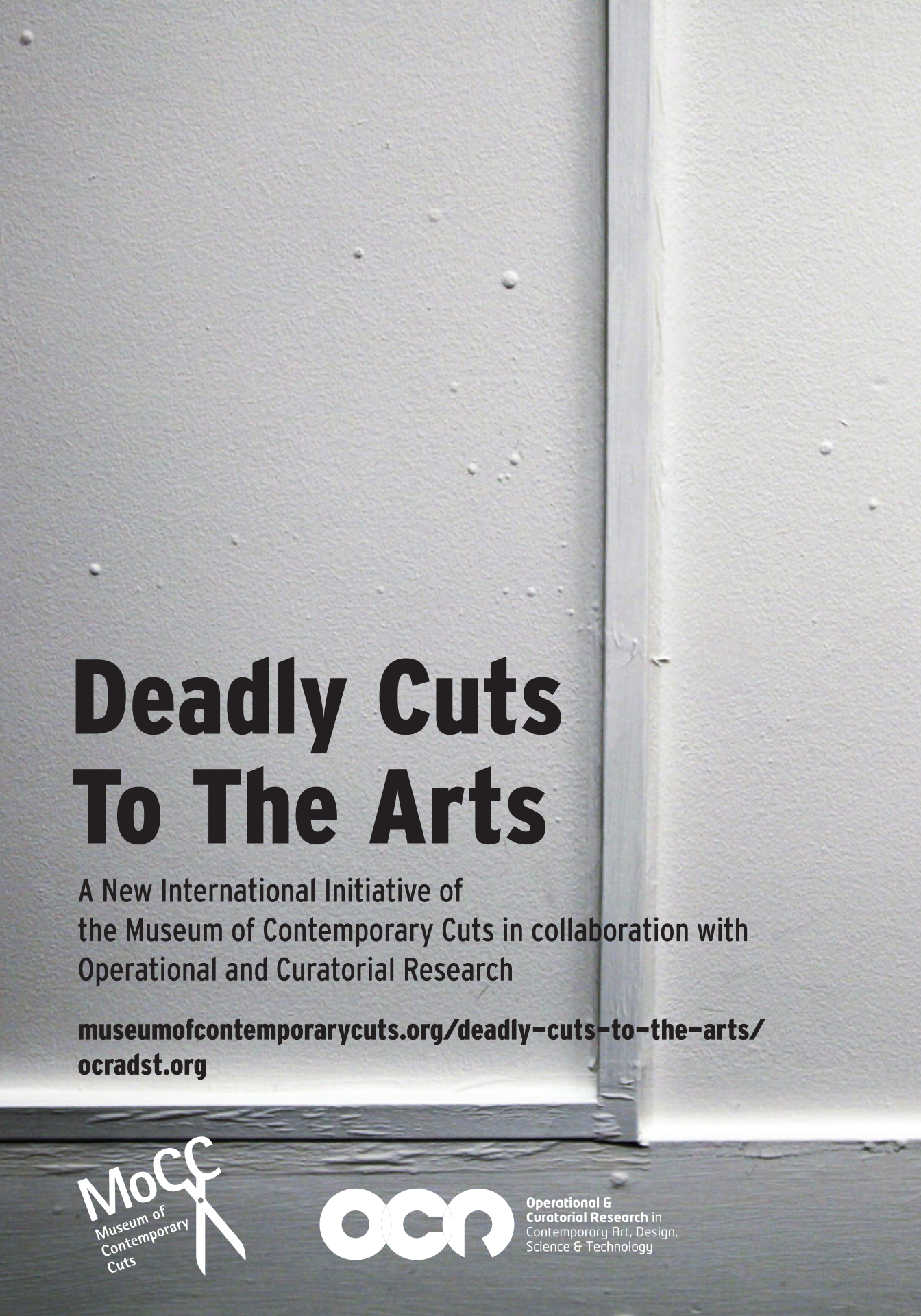

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