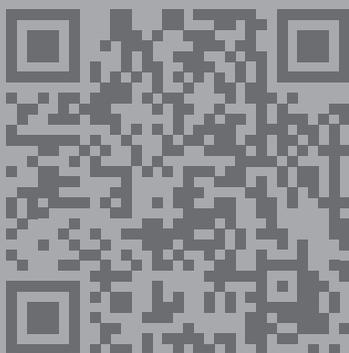
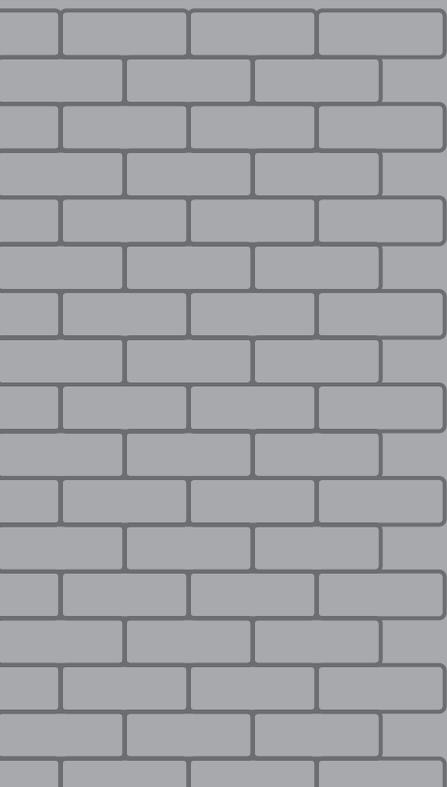


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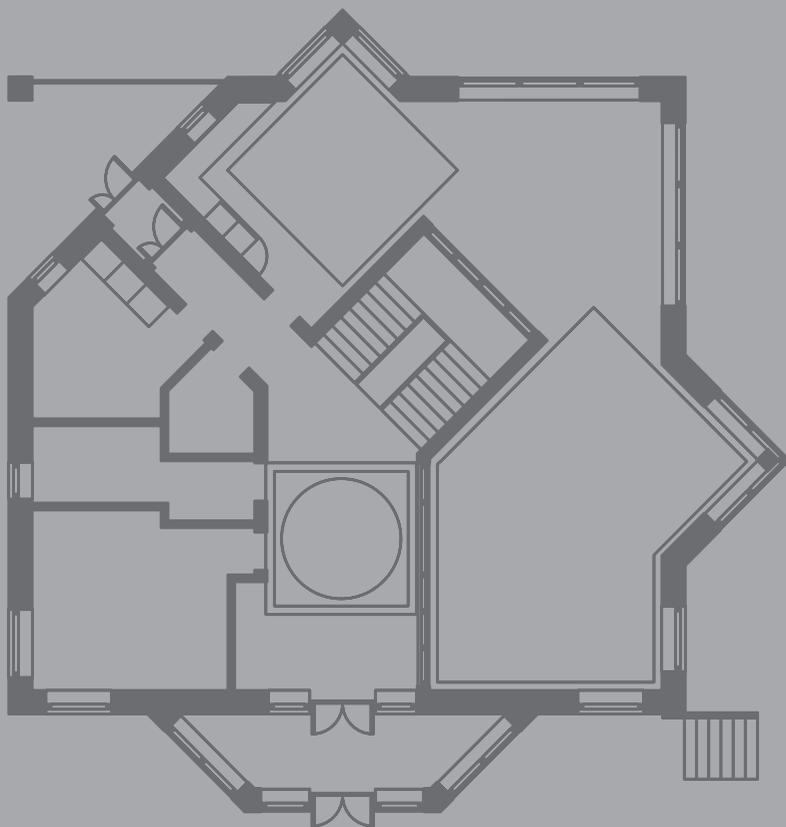
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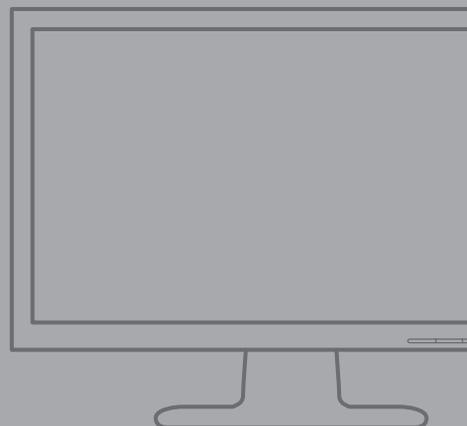
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EDITORS **ÖZDEN ŞAHİN**, **JONATHAN MUNRO** AND **CATHERINE M. WEIR**

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.



NOT THERE



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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

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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 similari-

ties 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 led 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-

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 contem-

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).

porary 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

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

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 by-passing 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

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



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

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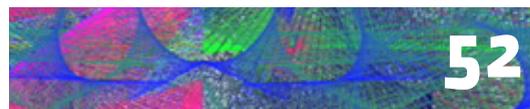
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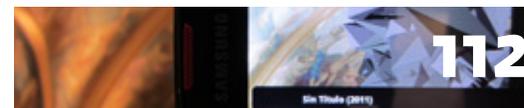
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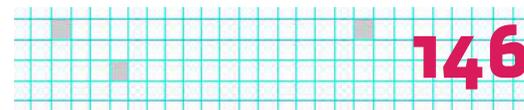
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LEAF++

Transformative Landscapes

by

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INTRODUCTION

In his work on the "Third Landscape," Gilles Clément introduces what he defines as our need to re-train our recognition and understanding of what we envision as the space between human and natural landscapes: "The Third Landscape – an undecided fragment of the Planetary Garden – indicates the sum of the spaces in which man gave up to nature in the evolution of the landscape. It regards urban and rural forgotten places, spaces for transit, industrial wastelands, swamps, moors, bogs, but also the sides of roads, rivers and train tracks. The whole of these forgotten places are reserves. De facto reserves are: inaccessible places, mountain tops, uncultivated places, deserts. Institutional reserves are: national parks, regional parks, natural reserves [sic]." The notion of a Planetary Garden encompasses the multiple, overlapping scales and conflicting ways we mediate the contexts of what is visible in urban or territorial space: indeterminate and universal; situated at the fringe or frontier; dynamic or static; oppositional or complementary. This border between what is seen as natural or artificially constructed continuously takes form before our very eyes. Contemporary landscapes encompass both the historical materiality and experiential form of what is marked as terrain.

The quotidian life forms surrounding us – grassy hillsides, flora and fauna – are generally restricted to a forcibly, objectified routine of recognizing and experiencing these life forms as that which is necessary for our use, trees to give us shade or to line our streets, fruits and vegetables to supply our nutritional needs.

ABSTRACT

Landscapes mark a certain terrain, delineating here from there and beyond: places and spaces of reference for our memories, our actions, helping us to place our being in specific moments. From private gardens to rolling hillsides in the country, landscapes represent overlapping visions of what is universal and at the same time personal. A multi-sensory experience we build and engage in anywhere, at any time. LEAF++ is a presentation and research project, an attempt at combining what we experience as individuals and, through the use of open source augmented reality (AR), adding on to the layers of what can be experienced by the wider community of users of a given site. The AR system combines computer vision techniques and allows for interactive experiences, educational contents and other information to be attached to leaves and other parts of plants: users contribute their own images, video, audio or other multi-media information to existing data available such as information about the plant's habitat and biophysical characteristics. The LEAF++ project has been applied to not only identify Gilles Clément's Third Landscape but also create a transformative view on urban space and foster experiential, analytical and aesthetic links between a diverse audience's visions, perceptions and behaviors.

It seems that we have distanced ourselves from the earlier life worlds of these objects – the seasonality of the produce we eat, the habitats in which they were grown, the geographies they have crossed to be placed on our shelves and in our kitchens. Previous studies have been concerned with analyses on exploring and enhancing this lost connectivity: encouraging farmers abroad to plant export-oriented varieties of fruits and vegetables all year round in order to satisfy the consumers who have been led to expect off-season produce any time of year.

Beyond our world view and supermarket aisles, we fail to see the surrounding plant life which fills the areas just outside of the urban landscape. Plants and

produce are relegated to the periphery, taken for their aesthetic or nutritive and not biological contribution to our co-inhabited space, hidden from view of the majority of people. Their beneficial characteristics and contribution to enhancing the biosphere as well as the inequities of their production are masked in our quotidian existence. Thus, the point of departure for this research has been the recognition of these hidden dynamics, the mediation of our knowledge and desire of these co-inhabitants of the shared landscape which has motivated the development of the LEAF++ project.

We embarked upon this process by firstly developing a strategy for a framework which could help in transforming the Third Landscape into an interstitial,

alternative way of critically and creatively engaging the politics and experience of landscapes. The focus was on increasing our awareness and knowledge and expanding our frames of reference of the (un)natural environments which surround our urban daily lives. We decided to create an augmented reality application which would utilize a digital platform to allow users to develop their own alternative, participatory strategies for re-engaging with various plant forms typically found in a limited number of specified regions. By combining a digital field guide and the already existing libraries of scientific information on various species with the unlimited potential for user-built contents, linked through the use of smartphone technology, LEAF++ finds room for oppositional spaces to be situated alongside a mainstream experience of nature. LEAF++ is connected to a Content Management System (CMS), which is supplied with contributions from people who can upload multimedia contents – such as images, texts or videos – and link them to the physical components of plants and trees. The user-generated content is linked, via the CMS, to specific leaves which have been pre-identified and included within the database for visual recognition. LEAF++ not only functions as a digital field guide for the identification of local flora but also allows for a connective, interactive environment to be created and established among people of all ages and dispersed across many different settings. The CMS works as a wiki, collaborative and connective environmental education platform in order to catalyze and enhance an appreciation, expression and interaction with nature.

THEORETICAL FRAMEWORK

Augmented reality is a way of attaching electronic objects to physical ones. Throughout history, the human production of space and objects ^{5,6,7} and continual augmentation has been taking shape, firstly through

the imposition of cultural features to our immediate reality ^{5,6,7} and more recently through the use of digital technologies which expand beyond the computer and become merged with the physical environment. This research has built on the wealth of literature already carried out on AR for its potential in enhancing learning contexts, practices and processes. As argued by Chris Dede and Sasha Barab, immersive learning environments, as in digital environments, have at least three elements or ways of enhancing education: “multiple perspectives, situated learning, and transfer”; furthermore contending that, “The more a virtual immersive experience is based on design strategies that combine actional, symbolic, and sensory factors, the greater the participant’s suspension of disbelief that she or he is ‘inside’ a digitally enhanced setting.” ⁸ Eric Klopfer regards AR applications as having the potential to “place learners in real-world contexts that promote transfer of learning from one context to another.” ⁹ Other studies have highlighted the difference between AR-learning environments and traditional process by showing that AR has been particularly effective in engaging and fostering social learning situations in which the participants are actively exploring and developing multiple pathways to deal with open-ended issues, especially through the mixing of various realities and a real-world setting. ^{10,11,12,13}

LEAF++: ENGAGING COLLABORATIVE LEARNING ENVIRONMENTS

LEAF++ functions as a ubiquitous, interactive system of information which can be employed according to various usage scenarios to produce a new view which, through the use of augmented reality, allows for an additional layer to be added to our visual landscape. This new ‘eye’ on the world links natural landscapes to an experience of the user’s determination. By taking a picture of a leaf with the camera of a smartphone, a

pre-set 3D feature recognition system is able to scan the form of the leaf and identify specific physical characteristics of the leaf. Once these are recognized, the system retrieves the associated information and content (taken from pre-selected sources and providing information on characteristics such as species, habitat, endangered status), as well as multimedia content ranging from interviews with local wildlife experts to recipes and herbal properties for medicinal uses. The CMS, built using a WordPress engine which has been modified to enable collaborative and multi-user functions, is used to organize and publish contents directly onto the physical leaves by linking the user-generated and pre-determined information. This allows the users themselves to design, create and collaboratively build the multimedia contents associated with the leaves and establishes a complex matrix of dialogic notes in the process.

The objective of LEAF++ was to enable a disseminated, ubiquitous and easily-accessible tool that enables an interactive, natural environment to be created utilizing and catalyzing an innovative, suggestive and user-generated physical contact with the physical components of our surroundings. The individual knowledge, wisdom and interest held by each one of us as regards our own personal interpretations is generally codified within our individual minds, but through the LEAF++ application we are able to open the floodgates to fill the collective experience of human-nature interaction.

METHODOLOGY AND TECHNICAL DESCRIPTION

The LEAF++ project has been designed and implemented through the following methodological steps:

- » initial briefing, which produced the definition of the concept;
- » the choice and experimentation of several technologies which could be used to realize the concept;
- » the design and implementation of several prototypes, which were used in an iterative, participatory process;
- » the generalization of the best prototypal solutions into an open platform;
- » the use of the resulting platform to create two use cases, for education and artistic performance.

Thus, LEAF++ is the means to create and define new cognitive landscapes. A cognitive landscape can be thought of as resulting from the mental elaboration by every organism of the perceived surroundings. ¹⁴ Within the framework of this process we continued in describing and laying out a set of objectives for the operational functions of LEAF++. These were later used in forming the conceptualization of LEAF++:

- » to create a tool for vision or, even more desirably, a new or mediated vision;
- » to create an accessible and natural interaction metaphor, as close as possible to the practices to those which we are accustomed to; one which is easily executable by a wide range of persons across cultures, age groups, skills;
- » to create an open platform, distributed as documented Open Source software, so that it will, in and of itself, create an active ecosystem of practitioners wishing to use and modify it to enable more practices and possibilities for vision, awareness, understanding, expression and ubiquitous knowledge sharing;
- » to create a usable information and interaction layer that is easily hooked onto the elements of the natural environment and that is accessible through mobile devices;

- » to create a process which harmoniously conforms with the processes of our vision; just as we interpret what we see geometrically, symbolically, culturally or through our memories, experiences and relationships, LEAF++ should progressively populate our mediated field of vision with aesthetics, information, knowledge, possibilities for relation, understanding and interaction, just as details progressively emerge while we look at things;
- » to design a platform that fosters collaborative educational processes and practices;
- » to create an aesthetic, sensorially stimulating, cognitively suggestive experience; one which is able to trigger wonder and emotion, to inspire action and participation, to activate cultures and open dialogues.

Continuing this line of thought, the research group next began developing the specific processes which were to be carried out in order to implement these objectives. One of the most crucial factors in this process was the recognition of LEAF++ for its capabilities in characterizing a new 'vision.' The current status and use of already existing AR systems was dissatisfactory in terms of their interaction metaphors, or in the ways their interfaces were set up for physical interaction. Many of these utilize a movie-inspired framework in which the interface for the augmented reality vision resembles a set of equipment dials, radar or sonar machines with floating icons and other elements which are similar to a video-game aesthetic. While this may be aesthetically pleasing and user-friendly in terms of design, this was incongruent to the feel of a new 'vision' which we were striving for. Our vision was composed of more of a transparent, lens-like viewer which would be transparent enough to allow the real-world background to be visible and onto which the AR layer would most naturally add to. An additional research challenge was posed by the limitations of GPS (Global Positioning System), compass and accel-

erometer which drive many AR systems. We sought to overcome this by focusing instead on a strongly computer vision based approach, which could be capable of bypassing the invasive nature of the more market-oriented AR techniques, contrasting greatly with the goals of the research project.

A primary objective for the project, not merely from a strategic standpoint but also in terms of our personal beliefs, was that the LEAF++ project would be open in terms of the technologies used and created throughout all the processes. As such, the research team decided to avoid the use of commercial platforms for computer vision based AR, even ones free of charge, and instead develop our own technology to be released to the international scientific and artistic community for open usage (the source codes for all the software used in LEAF++ is available through the project's website under a GPL3 license). Developing an open, working platform for the project was essential to the beliefs in pursuing a project which is fundamentally pursuing the system for open, accessible and shared knowledge.

During the second phase of the project, the technological architecture was defined.

We chose to develop a mobile AR browser with the characteristics defined during the previous stage. The chosen mobile platform was Apple's iPhone, mostly due to the availability of a stable development environment and for its ease of use – to satisfy the requirements in terms of accessibility and usability – and due to the availability of multiple international development groups dealing with computer vision issues such as the ones involved in the project, thus allowing us to establish an effective mutual collaboration which proved to be both effective and rewarding.

The platform which was created for LEAF++ is composed by the following elements:

- » a trainable computer vision module
- » a cms (Content Management System)
- » a service infrastructure

A computer vision (cv) module is used to provide image recognition features to the system. The cv module uses SURF (Speeded Up Robust Features) algorithms and techniques to identify the various types of leaves. The SURF image detection techniques and descriptors are used in the system together with a customized version of the optimizations.¹⁵¹⁶ Specifically, the cv component is integrated in a system enacting the following process:

- » image acquisition
- » generation of feature descriptors
- » classification and initial configuration of the cms

A guided procedure allows the user to capture all the images that are required to correctly identify the relevant visual features of the leaves that are to be added to the system. In the next phase of the process an interface is used to navigate the groups of images of each feature and to use them in generating the SURF descriptors that will be used in the end system. Each descriptor uses information captured by the images as described above to create the data that is needed for the real-time image recognition process. An initial version of the descriptor is generated automatically and the user is guided through a series of iterations whose objective is to refine this initial information, thus producing a better, more efficient, descriptor: by iteratively modifying selected parameters, and using the leaves in front of the camera, the expected results are compared to the effective ones, thus identifying the needed modifications to the descriptors.

At the end of the process each one of them is associated to a series of keywords establishing a taxonomy

whose nodes are associated to the visual elements of the various types of leaves.

This taxonomy is used in the cms. The cms is implemented using a customized version of the WordPress content management platform. The taxonomy produced in the previous phase is reproduced inside WordPress under the form of a 'customized taxonomy.' Using the standard features of the cms it is, thus, possible to associate multimedia content – videos, sounds, texts, documents and interactive experiences – to each part of the taxonomy and, therefore, to the visual elements of the types of leaves that have been added to the system.

All the parts of the system for the usage experience are brought together by the service infrastructure. The iPhone applications can be modified and integrated with a set of software components which connect to the device's webcam and enable the real-time functions of the recognition process. The leaf recognition takes place and once identified is translated into a series of terms in the custom taxonomy, thereby fetching the associated and relevant contents from the network by interrogating the modified WordPress cms. Finally, the multimedia assets become progressively visible on the viewfinder of the smartphone and are coherently placed with the real-time, on-screen positioning of the leaf.

RESULTS

The LEAF++ project has shown real promise in terms of enhancing traditional educational practices in the natural and environmental sciences despite its current preliminary status. The use and development of an open platform has served two specific purposes:

- » as a connective education processes;
- » as an art performance.

The driving force behind LEAF++ has been a goal to allow any and all interested subjects to create their own ubiquitous education, knowledge sharing and information dissemination processes. FakePress Publishing is in the process of further developing this platform and is currently applying it in several multi-author publications on themes such as ecology, environmental sustainability, and food and nutrition studies. We are also using the LEAF++ platform in generating mobile information facilities on the seasonality of fresh produce, food miles traveled and the terms of production under which they have been grown that are accessible anywhere and are helping to create engaging, entertaining and suggestive ways of establishing a re-connection with the knowledge and traditional wisdom on food and ecosystem.

LEAF++ is also being used for the execution of an art performance in which the system is not connected to a set of databases containing information but, rather, to a generative audio and video engine. In this 'concert for augmented leaves' the performers use the leaves in front of cameras to generate suggestive audio and visuals. The performance is currently being developed into a fully participatory experience in which the audience takes the role of the performers and is free to move around urban space and generating the audio and video collectively, by augmented-looking at the leaves they come across.

Several authors have recently identified the new technological, managerial and cognitive challenges to teaching and learning posed by AR-based learning tools.¹⁷¹⁸ Alongside this up-and-coming research

agenda, LEAF++ contributes an applied investigation of some of these challenges in creating AR-enhanced, connective ecosystems and making a case for their free distribution among the international community of educators and researchers. However, recognition of the limitations of this rather limited applied study require further testing in a wider variety of topical areas and in other research projects.

It has been the aim of LEAF++ to attempt to test these waters and it is the hope that connective educational platforms, like LEAF++, will continue to the efforts in raising awareness and engaging people in the struggles faced in the surrounding Third Landscape. ■

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SALVATORE IACONESI, LUCA SIMEONE, ORIANA PERSICO, CARY HENDRICKSON

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?

We think that FakePress lives and operates across borders. On several occasions, we spoke with very different audiences when we presented the same installation at a scientific conference or at an art exhibit. In other cases, we exhibited in venues where the boundaries between the Art World and the scientific community were more blurred, such as in the Planetary Collegium Conferences or at ISEA. Yet, also in those venues, the feedback and the reactions we usually gather from different people coming from different disciplinary background are very diverse.

FakePress itself is composed of researchers with very different backgrounds: cultural anthropologists, engi-

neers specialized in robotics, environmental scientists, communication specialists, and marketing people.

The continuous exposition of these radically different grammars, languages, and points of view forces us to navigate across heterogeneity with a strong conversational method. A continuous dialogue allows us to connect and disconnect disciplinary and cultural components and elements and to articulate some sort of precarious patchwork.

In his *On the Edges of Anthropology*, James Clifford gives a beautiful description of the idea of articulation: "Articulation is the political connecting and disconnecting, the hooking and unhooking of elements – the sense that any socio-cultural ensemble that presents itself to us as a whole is actually a set of historical connections and disconnections. A set of elements have been combined to make a cultural body, which is also a process of disconnection, through actively sustained antagonisms. Articulations and disarticulations are constant processes in the making and remaking of cultures" (Clifford 2003, p.45).

Coming back to your question: our interventions are usually the results of those connections and disconnections across disciplinary borders. To continue on Clifford's work, when we end up with a fully branded and packaged marketing strategy for our work and start disseminating it towards different audiences we act as import-export specialists across socio-political and socio-material cultural borders.

We also find Clifford's definition useful because it highlights the spatial and temporal conditions of this connecting and disconnecting, suggesting that it is a process that can change over time and according to specific contexts.

"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?**

We tend to see our work very much in terms of *infra-structuring*.

Most of our projects live through the active engagement of the final users who, in most cases, use the platforms or the framework we created in order to perform their own design or artistic activities.

We release most of our projects with open source licenses and interested people can use both the platforms we designed and the programming codes behind them. Over time we have seen amazing examples of interventions performed by other people using our platforms or infrastructures.

Our current internal debate within FakePress is how to fine tune this infrastructuring strategy in order to increase its potential within the constructive design research framework. As argued by Koskinen et al., constructive design research "refers to design research in which construction – be it product, system, space, or media – takes center place and becomes the key means in constructing knowledge."

In line with this approach, we are trying to explore how to infrastructure a constructive design research

framework by stretching and extending the DIY approach behind our interventions.

The idea is that our platforms should somewhat go beyond being pure provisional and flexible configurations that can be quickly re-arranged according to the circumstances, and instead they should try to shape a more focused research framework that engages an increasing number of designers, artists, users who keep collaborating in a more stable way over time.

In these terms, it is difficult for us to position ourselves in terms of inside/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?

Our inspiration comes from many different directions and domains. In fact, each project we embrace requires a specific process in which we collaborate in the creation of a complete perspective of those researches, practices, products, artworks, and services that have addressed in some way the issues and themes we are about to face.

In this, we draw on multiple types of sources, which provide not only inspirational insights, but also a scenario of the relevancy and impacts of the themes we address in relation to different cultures and societies.

Over time, new technologies and communication strategies have allowed human beings to transform the ways in which they work, learn, relate, com-

municate and interact with their cities, objects and practices of their daily lives. This has happened with consumer products, widely adopted technologies, and with the emergence and transformation of new cultures which have opened up entire new spaces for human expression.

In our projects we try to gain a deep understanding of these processes on a global scale. Starting from an ethnographic point of view – and, thus, investigating on the practices of communities, groups, cities – and expanding into the observation of the visions suggested by emerging technologies and practices.

In this perspective, our inspiration can come from consumer products (just like in the case of the Sony Walkman, which produced the first widely adopted form of augmented reality, in the form of customizable sound environments through which we can shape the perception of our surroundings), or from the pioneering experiments of researchers such as Ivan Sutherland or Douglas Engelbart (who have conceived forms of interaction which have completely transformed the ways in which we perceive our current possibility to relate to data and information), or from the research of people such as Edward Tufte (who have contributed to the formalization of the strategies according to which we are now able to understand and represent information). All the time looking back to the radical interventions in arts and culture of individuals and groups such as the Surrealist, Dada, Conceptual, Performative and, more recently, technology based arts, and all the urban practices which have provided insights about the possibilities to reinvent the spaces and processes of cities (such as rave cultures, skateboarding, street arts) which have provided breakthrough scenarios in our perception of our lives and cultures. The process of merging these sources of inspiration to the theoretical approaches of individuals such as Walter Benjamin, Michel de Certeau,

and all the others who have provided novel points of view on our lives in urban spaces, and then using this knowledge in the observation of emerging products, services and practices, constitutes our main form of inspiration.

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?

We experience the domain of aesthetics as being instrumental to the goals which we set forth in each project, and, in general, we refer more to the concept of *experience*.

Aesthetics is part of the wider scenario of the experience that is produced in people when dealing with a certain artwork, product, service or other form of interaction.

Aesthetics can be chosen according to multiple strategies, referring to, amongst others, the definition of the intended targets of fruition, or in support of the look and feel of the experience, or to refer to the specifics of selected cultural contexts. Even more, aesthetics can (and should) be chosen to promote the positive, constructive encounter and interrelation of multiple cultural contexts, referring to the archetypal, contextual, symbolic, semiotic and ontological dimensions of each one of them; and understanding how to combine them to obtain significant, insightful, satisfactory, empowering and inspiring experiences for all actors involved.

On top of that, aesthetics – in the more general terms of the framework of sensorial experience – can be used to suggest the active participation of individuals and communities to the proposed processes and experiences, describing the cognitive approaches according to which users perceive the possibility and

opportunity to become active agents, defining affordances for objects, spaces and social contexts. In this scenario, Art can play a significant role.

Art has had a strategic role throughout human history. It is both a sensor and an actuator of the emerging issues of societies, and has always allowed approaches which are able, on one side, to address fundamental issues and, on the other side, to generate visions and insights on the scenarios of possibility.

For this reason, collaboration between arts and research, design, architecture and other human practices represents enormous value.

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?

One of the main foci of our projects is the idea of enabling novel forms of expressions for multiple cultures, allowing different voices and points of view to participate in the process. Many resources are dedicated in this direction and the technological systems used in projects commonly support dozens of different languages and experiences which can be customized according to the different cultural contexts in which they will be used.

One surprising thing that has started to happen in our projects is the (previously unexpected) responses from parts of the world which classically have been very hard to get involved. In projects such as LEAF++, or *The Electronic Man* produced by FakePress, users have started to appear in places characterized by high degrees of digital divide and (as of yet) limited strategies dedicated to digital inclusion, such as multiple locations in Africa, South and Central America, and Asia.

This occurrence has proven to be truly insightful for our team, as we have realized the possibility to use our projects as both a tool to promote digital inclusion and as an indicator of the current state of digital citizenship in these locations.

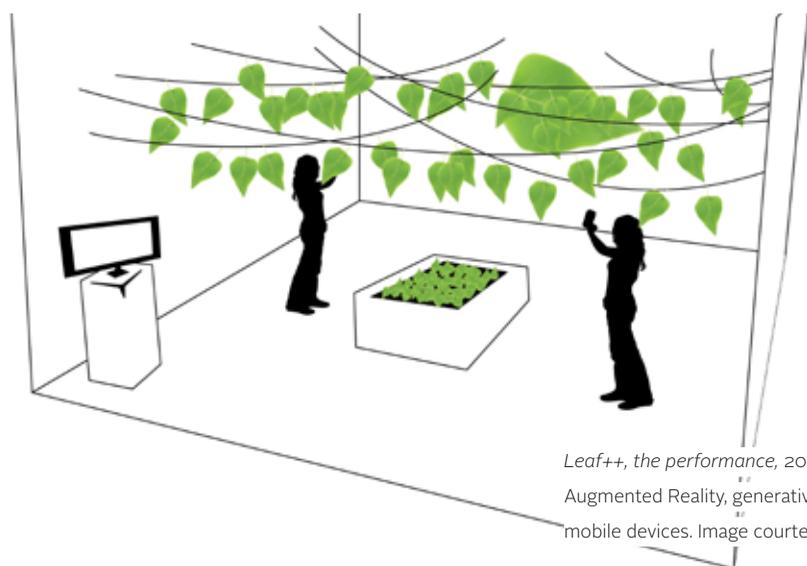
Since the first occurrence of interactions coming from these locations, we have started to purposefully address these issues, in a series of different ways. The practices of radical openness have proven to be quite successful: each project is released together with the technologies used to create it and their documentation, under open licenses such as Creative Commons and GPL; tutorials and how-to's have been commonly produced; workshops have been designed and performed, to use constructivist strategies to the adoption of these technologies and to support communities into understanding the new opportunities and to devise their own innovative practices in participatory ways.

In this process, access to the domains of arts and creativity has proven to be strategic, allowing us to enact initiatives which are able to inspire and to suggest visions, and to create access for children and disadvantaged communities. ■

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Leaf++, the installation, 2011, FakePress Publishing. Leaves, Augmented Reality, mobile devices and info-aesthetic visualizations. Image courtesy of the authors.



Leaf++, the performance, 2011, FakePress Publishing. Leaves, Augmented Reality, generative sound and visualizations and mobile devices. Image courtesy of authors.

In our research, we explored these new spaces by investigating new forms that such innovative practices can assume.

We designed a next-step publishing house producing cross-medial, multi-author, open-ended narratives that are built on constructions of networked, pluralistic, non-deterministic, interpretative layers of reality through location-based, augmented reality, spime and natural/gestural interfaces.

FakePress, the name of the publishing house, aims at a potential redefinition-through-disarticulation of practices that refer to narratives, education, knowledge sharing and distribution, communication, interaction, emotion and relation.

In this scenario, what is a Publisher? What processes does it enact? What are the media, spaces and tools it can use?

Leaf++, feature detection at different settings, 2011, FakePress Publishing. Leaves, SURF Computer vision algorithms. Image courtesy of the authors.



Traditionally, publishing houses select, filter and edit content before disseminating it. In the process, the roles of the content producers and of the content receivers are established in relation to one another. In FakePress, these concepts are maintained but also disassembled and reassembled following a different logic, enacting a different set of processes and, within/amongst them establishing new forms of relations which evolve along different, nonlinear, axes in time, space and activities.

In this reinterpretation of the editorial process, design starts off with imagining and formalizing experiences, starting from a set of behavioural observations and a series of axioms:

- » multi-authoriality, meaning that content is to be natively hosted in an environment that assumes and allows for the presence of multiple voices, points of view and layers for interpretation, at any time and place;
- » interactivity, so that content can be updated, extracted, remixed, re-contextualized, distributed, and reviewed;
- » open-endedness, and focus on continuous – or continuable – ongoing streams, more than on complete narratives;
- » sensoriality, also allowing for the new tactile experiences enabled by digital interactive technologies, by natural and gestural interfaces, by interactive environments, and by the availability of digital infoscapes superimposed to the physical domain;
- » ubiquity, and accessibility, leveraging mobile, wearable, and location based technologies;
- » sustainability and social significance, by enacting a critical evaluation process.

Axioms and behaviours are used to shape the publication, which can assume multiple manifestations: mobile, location-based applications, devices, technological wearable garments, websites, electronics, architecture or physical designs are all possible media used in this process. ■



Leaf++, image optimization in preparation of feature detection, 2011, FakePress Publishing. Leaves, SURF Computer vision algorithms. Image courtesy of the authors.

Deadly Cuts To The Arts

A New International Initiative of
the Museum of Contemporary Cuts in collaboration with
Operational and Curatorial Research

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Operational &
Curatorial Research in
Contemporary Art, Design,
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