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Virtual Reality and Augmented Reality

New Tools for Art and Politics

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Since the early 90s, visual artists have been attracted by VR technology and its great socio-political potentials: it is the pioneering case of feminist artist Jenny Holzer. However, despite the fact that nowadays mainstream artists like Marina Abramović, Jeff Koons or Ai Weiwei have gone virtual, VR promises are far from being completely fulfilled. On the AR side, artists have explored alternative ideas of power, also using this technology to denounce systemic racism. However, critics of these technologies also highlight the risk of developing a sort of an “armchair activism”. This paper will discuss how, by producing image-worlds (an-icons), VR and AR artworks can effectively address political and social issues. Nevertheless – like any other medium –, such technologies can both critically reveal and ideologically conceal relations of power.

Keywords: An-Icons, Augmented Reality, Contemporary Art, Image-Worlds, Politics, Virtual Reality.

1. Rhetorical effects in Virtual and Augmented Reality

Virtual Reality (VR) takes you there in the digital world. Augmented Reality (AR) brings the digital into your real world. In the former case, you are teleported away from your actual environment (and from your own body), and you experience a distance which suddenly becomes a close presence; in the second case, while you keep perceiving your present world, 3D objects from another space-time break into your environment, making themselves present and near. A veritable dialectic between

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distance and nearness, absence and presence, is modulated differently in the two digital environments. And yet, in both cases it is a matter of a basic polarity – near/far – that significantly impacts on our aesthetic and socio-political relationship with others and the world, precisely because its elementary spatial nature is capable of assuming more and more complex symbolic layers of meaning.

While following different paths, and exploiting distinct technologies, VR and AR nevertheless seem to share some fundamental properties which pertain to what may be called their *rhetorical* nature.

Firstly, they aim to achieve *unframedness*. Once you put on VR head-mounted displays (like Oculus Rift or HTC Vive) or AR devices (like Magic Leap One or Microsoft HoloLens 2), you can no longer execute a straightforward yet crucial operation, as has been possible for centuries in the relation between human beings and their images (be they paintings or photographs, sculptures or movies, drawings or TV series). Traditionally, images have occupied a specific place in the real world, marked by a framing device that signals the peculiar iconic nature of these objects, to which different rules apply, rules differing from those regulating the real world: our gaze can always decide to point “off-image”, as it were, by focusing on parts of the visual field which do not belong to the image. This freedom is dramatically limited, and ideally negated, in VR and AR environments. In virtual 360° worlds, the visual field is saturated with images: anywhere I turn my head, I will see images constantly unfolding before my eyes (fig. 1). In augmented environments, the 3D digital objects tend to become perfectly integrated within my peripersonal space-time, so that I can interact both with them and with actual objects. In both cases, the isolation performed by the frame assuring an “island-like” (Simmel, 1902; Ortega y Gasset, 1921) quality of the image gives way either to a total substitution of the real world by the iconic world (VR) or to a seamless integration between the real and the iconic world (AR). For VR as well as for AR we can speak of a process of “environmentalisation” of the image: the image trespasses its own boundaries and either replaces reality or incorporates itself into it.

Of course, one may object that the framing is far from having been abolished. It has just been reformulated: I decide to wear the VR or AR device; I access the digital world; I conclude the experience; I take off the device. This sequence amounts to a specific temporality carved out from the real temporal flow. Moreover, it is a temporal sequence during which I feel on my head the weight of the device itself (not to mention the framing constituted by a smartphone when this is used as an AR device). However, if we consider the rapid pace of nanotechnological and biotechnological developments – predicted by visionary representations of our imminent cyborg future, like those offered in TV series such as *Black Mirror* (2011-



FIG. 1. “Samsung’s Virtual Reality MWC 2016 Press Conference” by pestoverde is licensed with CC BY 2.0 (<https://www.flickr.com/photos/pestoverde/26666393696/in/photolist-GCqeNy-GfEBxy>). To view a copy of this license, visit <https://creativecommons.org/licenses/by/2.0/>.

2019) or *Westworld* (2016-2020) –, we can easily expect a progressive weakening of our capacity to distinguish a virtual environment from a real one based on those marks that still ensure a prop to draw such a distinction.

This process of iconic environmentalisation brings us to the second property shared by VR and AR environments, a property which is intimately connected to unframedness: *presentness*. Framed pictures like paintings, photographs, and films are certainly presences in the real world, things among other things. I perceive them through my eyes, just like any other presence in my visual field. And yet, such pictures introduce us to a sort of “unreality” (Fink, 1930). While I can say that I am two meters away from the painting hanging on the wall in my room, it is much more problematic to affirm that I am twenty meters away from the little man represented in the same painting. Actually, that man is not “little” at all: on the contrary, compared to other objects represented in the painting, he seems pretty big. And yet, if I measure his figure, it is just ten centimetres tall. But I cannot apply to the spatial relationships established within the painting the same rules that govern my actual spatial world: there is no continuity between the iconic and the real domain.

On the contrary, once I have plunged into the VR world, I no longer find myself *in front* of the picture (be it supported by a canvas, a wooden

panel, or a sheet of paper); I am rather *inside* the image, immersed in a 360° environment which elicits actions and movements, affordances and agencies: my own presence is transported into the digital world. Conversely, in the case of AR, digital objects are immersed in my own actual world, diving into it, as it were, becoming present and manageable just like any other real object.

To describe this aspect of the iconic environmentalisation, we could draw on Uexküll's theoretical biology, and in particular on his notion of the environment as *Umwelt*: literally, a world (*Welt*) which unfolds around (*um*) me. Uexküll (1934) insisted that the *Umwelt* is not just a question of perception, but also of action: he conceived of it as composed of a *Merkwelt* (a world that makes me notice – *merken* – things) and a *Wirkwelt* (a world we can have an effect on – *wirken* – through our actions). On the one hand, the *Merkwelt* points to the technological efforts progressively made to achieve not just a visual effect of presence, but an increasingly *multisensory* experience: spatialized sounds and binaural recordings producing a 3D stereo sound sensation, but also haptic and somatosensory feedback and olfactory stimulations, aim to ensure a truly multimodal engagement, which promises to substitute the Internet of Things with the Internet of Senses by 2030 (Bayern, 2019). On the other hand, the *Wirkwelt* calls for interactivity and manipulation: the traditional (Kantian in broad terms) subject absorbed in the disinterested aesthetic contemplation of the artwork gives way to an active experiencer engaged in an interaction with “operative” (Farocki, 2004) or “operational” images (Paglen, 2014) (fig. 2).

While this is pretty obvious for AR technology (if we think of its applications in domains such as the military, architecture and urban design, healthcare or education: see some examples in Marr, 2018), further specification is needed for VR environments: here a major distinction is to be considered, namely the one between 3 and 6 Degrees of Freedom (DOF) that is made possible by different headsets – a terminology imported from biomechanics and robotics, and referring to the movements of robot arms and joints for the execution of various manoeuvres.

Unframedness and presentness are strictly intertwined with a third property – probably the most paradoxical – of VR and AR environments: *immediateness*. These technologies aim to create an effect of immediacy through the extensive employment of highly sophisticated techniques. Immediateness strives to satisfy the “myth” (Bolter and Gromala, 2003) of medium transparency: medium opacity is blurred and concealed in many ways to the full advantage of what is directly exhibited as reality itself in the mediated environment.

In this respect, VR and AR environments seem to challenge mainstream Western theories of the image, which have stressed the twofold nature of every iconic representation as something composed by the *representing*



FIG. 2. “Hololens augmented reality patent” by sndrv is licensed with CC BY 2.0 (<https://www.flickr.com/photos/94549193@N00/36314167451>). To view a copy of this license, visit <https://creativecommons.org/licenses/by/2.0/>.

medium and the represented object. Various authors have maintained that the observer of a picture has the liberty to focus her attention either on what the picture represents or on the concrete support materialising the picture as a spatial object: e.g., either on the landscape appearing in the painting or on the canvas and pigments, either on the face portrayed or on the grain and weight of the photographic paper. Husserl’s distinction between *Bildding*, the image thing, and *Bildobjekt*, the image object (Husserl, 1904-1905, p. 21); Panofsky’s account of how we identify a recognisable figure emerging from lines and colours at the “pre-iconographical” level (Panofsky, 1939, p. 5); Marin’s dialectic between opacity and transparency (Marin, 1988, p. 256); Wollheim’s twofoldness theory, which distinguishes between “seeing the medium” and “seeing the object” (Wollheim, 1980, p. 143); and Boehm’s notion of “iconic difference” (Boehm, 1994): notwithstanding the specific ideas behind each of these theories, they were all developed precisely to ensure the interdependence between the representing medium and the represented object.

On the contrary, VR and AR environments aim to increasingly limit, and ideally to annul, our capacity to freely orient our gaze towards one level or the other, by blending the two aspects of iconic representation into one experience. Just to provide an example, once I have put on my virtual headset and adjusted the controllers, there is no way I can concentrate my attention on the materiality of the surface displaying the images, as I could do by adjusting the angle of my PC screen when watching a movie or by focusing on the craquelures of a wooden panel. This powerful transparency

effect promotes in the user a belief in direct and non-mediated access to the real, in an unfiltered and authentic ingress into the true world. In the case of historical fakes, the manipulative editing of photographs (indexical images *par excellence*, in charge of the documentary witnessing of the event that really occurred) could be exposed through a scrupulous investigation of the alterations of the material support, but with the new digital media the possibility of such demystification seems dramatically reduced.

So far, we have sought to highlight what distinguishes VR and AR environments (by virtue of their unframedness, presentness, and immediateness) from classes of pictures like paintings, photographs, and movies that have historically preceded them. However, we should not think of VR and AR as having broken into our iconosphere out of the blue. Quite on the contrary, it took a very long time to pave the way for their appearance. We may venture the hypothesis that – at least in our cultural tradition – all epochs, according to the available image-making technologies, have attempted to develop specific immersive strategies to promote an experience of frameless and transparent pictures inducing a strong feeling of presence, of “being there”. Among the milestones along this path, we must certainly mention the ancient tradition of illusionistic trompe l’œil painting, Renaissance perspectival constructions, dioramas and panoramas, phantasmagoria, stereoscopes, and 3D cinema (Grau, 2003; Griffiths, 2008). Some theorists go as far as to find proof of such strategies even at Lascaux (Nechvatal, 2005).

This peculiar class of pictures calls for a *critical* investigation into the various meanings of the concept of “critique”: in the Kantian sense, of course, of an examination of the conditions of possibility and limits of VR and AR technologies; but also in the sense of a renewed critique of the ideology of such apparatuses, in the wake of Althusser (1970), Baudry (1974-1975), and Žižek (1994). At the beginning of this section, we have written of the “rhetorical nature” of VR and AR environments. After addressing the three main properties they share – namely unframedness, presentness, and immediateness – it has become clear that such properties define the phenomenological *effect* that such technologies aim to produce on the user, rather than their actual (one may say: ontological) *nature*. The images obtained through these technologies are framed yet designed to appear unframed; they are representational yet intended to evoke sheer presence. They are highly mediated, but nevertheless work towards transparency. This aspiration is powerfully sustained and expressed by the regime of rhetorical discourse surrounding VR and AR technologies, often advertised as “the magic of presence”, “the ultimate empathy machine”, and the like.

We propose to name this critical investigation “an-iconology” (Pinotti, 2020), understood as a theoretical and historical approach to “an-icons”: pictures (*icons*) which tend to negate (*an-*) their iconic status, producing the

effect of being the reality they represent. We think that such an investigation is urgent, to the extent that immersive AR and VR environments promise to become more and more pervasive in our daily existence and professional lives. Nowadays (not least on account of the Corona pandemic) we spend several hours per day *in front* of a screen (be it a TV, computer, tablet, or smartphone). What would happen if, instead of being in front of a screen, we were immersed in it? Moreover, we should consider the fact that in just a few years we have become accustomed to touch screens, and that for young “touch natives” the experience of an image has become both a visual and a haptic issue. What will happen when “immersive VR and AR natives” become not the exception, but the norm? It is evident that such questions entail not just an aesthetic or technological implication, but also a political one, to the extent that they affect the way in which we live together in the “polis” as a social space.

As has often been proved in the history of our cultural tradition, artistic practices are a veritable two-faced herm: on the one hand, they can be efficiently put to the service of ideology, mystification, and propaganda. On the other hand, they seem to possess a powerful capacity to develop critical insights and to expose ideological masks. This double face is no less true of VR and AR artistic applications, as the following section will show.

2. The promises of Virtual Reality

VR was born in the late 1960s when Harvard scholar Ivan Sutherland designed the first headset. According to this pioneer, “with appropriate programming such a display could literally be the Wonderland into which Alice walked” (Sutherland, 1965, p. 508) and the “objective in this project has been to surround the user with displayed three-dimensional information” (Sutherland, 1968, p. 757). Given this very ambitious goal of enclosing the viewer in a 3D world of data, the results achieved did not live up to expectations and VR experienced a revival only later, at the turn of the 1990s. At that time, the debate involved not only IT specialists but also a wider community of researchers and intellectuals. Among these, American philosopher Donna Haraway, a prominent scholar of the relationship between humans and machines, expressed her view in her short text *The Materiality of Information*: “One of the things that strikes me most about VR at the present is the extraordinary gap between the descriptions of what VR will provide and the actual technology and people’s experiences of it to date” (Haraway, 1992, p. 17). What she notes is the disappointment regarding her own personal experiences with this technology, such as the first time she tried it, in the Washington University computer labs, in a kind of vault protected by a locked door inside a building that looked a lot like a prison.

For the American philosopher, while VR is certainly interesting, all it can offer at present – by contrast to the extraordinary ability of cinema to immerse the viewer in another world – is only a promise:

What VR promises is the ability to take a human body and make multi-media and multi-sensory presentations with real-time feedback, so that you don't have the gap that disrupts the reality effect. [...] At the same time, you can produce a particular kind of "Alice in Wonderland" effect: a scaling issue, so that you can become very large or very small, and either inhabit a world at a different sense of scale, or surround a world. The promise of VR is to produce a different set of conventions (Haraway, 1992, p. 19).

Comparing this promise to others that have remained largely unfulfilled, such as that of nuclear energy, the author of *A Cyborg Manifesto* ultimately argues that it will not necessarily be a vain expectation, since even expectations and ideas actually act socially, economically and politically: "Something doesn't have to happen to be effective, that wasn't the point. The point is, the common sense of the production of possible worlds becomes something everybody now takes for granted" (Haraway, 1992, p. 20). The question then is *who* will produce these worlds and *what* they will be like.

These are the questions that American artist Jenny Holzer tries to answer in the same volume: for Haraway's intensely political contribution is featured in a book published on the occasion of a contemporary art exhibition in a commercial gallery, the New Yorker Jack Tilton Gallery. Held in the summer of 1992, this pioneering yet little-known exhibition was curated by another woman, Janine Cirincione, and entitled *Through the Looking Glass: Artists' First Encounters with Virtual Reality*¹. The exhibition, in which other artists such as Matt Mullican and VR pioneers like Jaron Lanier took part, presented projects for artworks to be realized with VR², but also real experiences accessible with headsets in the gallery spaces. The ground-breaking nature of these early problematic attempts is reported in a review published in the "New York Times": "The equipment required to produce the full three-dimensional illusion of virtual reality is still expensive and unwieldy. For this reason, most of the pieces in *Through the Looking Glass* are presented as sketches or proposals, rather than as working systems" (Hagen, 1992).

The volume including Haraway and Holzer's texts contains contributions that are not strictly related to the artworks on display. It features interviews with intellectuals, artists, and operators in the sector, who were

¹ Curated by Janine Cirincione, Jack Tilton Gallery, New York, 4 June-17 July 1992.

² The works exhibited were not exclusively realized or designed for VR, since they included interventions that today we would define in the broader context of new media art (Hagen, 1992).

all asked the following question: “What types of cultural futures should we create with digital technology – specifically virtual reality?” (Cirincione and D’Amato, 1992, p. 3). This question presupposes an awareness of digital technology as a design tool in the broadest possible sense, as well as a political problem in a more general sense.

Already well known for her research on language and as a leading feminist in the American art scene of the Eighties, Jenny Holzer began her career with the series *Truisms* (1977-1979) and *Inflammatory Essays* (1979-1982): sentences or entire texts characterized by a rational analysis of contemporary society, projected on the facades of buildings in public places or created through the use of LEDs in exhibition spaces, as well as through various other media. At the time when she answered Janine Cirincione’s questions, the artist had recently won the Golden Lion for the best pavilion (the American one) at the 44th Venice Biennale and was developing a VR project. From an artistic point of view, this was a pioneering work to be realized through a technology whose potential was still little known to the general public. In this respect, Holzer took a risk, especially considering that her research had largely focused on written texts rather than on the production of images or environments.

By asking Holzer about her design intentions, Cirincione touched precisely on this topic, namely the future and destiny of language in VR, reminding her of what Jaron Lanier, the founder of the company VPL (Virtual Programming Languages) Research, had said about the progressive reduction of the importance of written and spoken language in VR. According to the inventor of the expression “Virtual Reality”, in a virtual world, everything will be actable, demonstrable or communicable in a way that will preclude the need for language.

Declaring her intention to use some old texts in the new project, but also her new “war writings”, Holzer disagreed with this verdict. The artist defended verbal communication against the idea of acting in a virtual environment, intending to use VR first to communicate and then to reach a wider audience, even beyond the boundaries of the art world. Holzer tried to put this theory into practice via two artistic experiences – “an-icons” or “image-worlds” significantly entitled *World I* and *World II*, – presented in the autumn of the following year as part of the exhibition *Virtual Reality: An Emerging Medium*. The exhibition was produced by Intel Digital Education & Arts Program and Sense8, and set up at the Guggenheim Museum in Soho⁴. Holzer presented two different experiences created in CGI and

³ A documentary on this exhibition is available at: <https://vimeo.com/25048073> (accessed: 19/12/2020).

⁴ *Virtual Reality: An Emerging Medium*, Guggenheim Museum SoHo, New York, October 23-November 1, 1993.

made accessible through headsets, which were presented alongside both artistic and non-artistic projects. *World I* is a tunnel in which anguished and suffering faces on floating dices utter famous phrases by the artist when intercepted by the spectator. *World II* offers a desolate landscape under a leaden sky, with low, bare, and empty buildings. Entering these abandoned houses, the visitor can hear the voices of witnesses recounting acts of violence and rape suffered by women in Bosnia during the civil war. This project represents the first step in a broader research devoted to the Bosnian-Serbian conflict: in the same year, the artist also presented *Lastmord* – a German term used to describe sex-related murders – which included a LED installation and photographs of texts written on the skin of some women. Here in Virtual Reality, however, the words and phrases that made the artist famous are not written but uttered by human voices: the visitor is teleported into an extraneous and artificial dimension while listening to stories that dramatically refer to real, physical facts. When asked about the capacity of VR to reduce “the gap between life and art” in an interview she gave in February 1994, Holzer replied: “Well, I think in trying to make life seem real enough that one is moved to do something about the more atrocious things. By going really far afield into a completely fake world, maybe there’s a chance to make things resonant somehow – or in this case, truly terrifying. To make it as bad as the real stuff that’s happening” (Snider, 1994).

For the exhibition visitors, the experience must have seemed futuristic and far from everyday life: we should recall that it was only with *Doom*, the first-person shooter created by Id Software in the same year, 1993, that a wider audience started to become familiar for the first time with a walkable 3D polygonal graphic space. Holzer’s use of VR attracted criticism from those who blamed her for the contradiction of employing such an expensive and elitist technology to denounce the violence of war:

I visited the Holzer piece – which consisted of a fuzzy, bombed-out, Bosnia-like landscape in which disembodied voices spoke of unspecified tortures from empty houses. Although Holzer may have meant to comment on the fact that VR was developed by the military, the work seemed to me to be an unhappy conjunction of a trendy new technology and a stridently charged subject matter (Pinchbeck, 1994).

Indeed, the still prohibitive costs of the equipment severely limited access to VR. The experiences mentioned above were excellent exceptions: the debate in these years remained mostly theoretical and only minimally based on real experiences in terms both of the production of works and of public access (after all, Donna Haraway’s meticulous report of her personal experience in a university laboratory gives us a good example of what must be a rather unique experience and justifies her idea of VR as a promise, more than a fact).

Almost thirty years on, this promise has been partially fulfilled thanks to the production of cheaper devices and to the improved quality of virtual images (that today are even more immersive than cinematographic ones). VR became a focus of heated debate once again when Californian start-up Oculus launched the first low-cost VR headset on the market in 2015 and experienced a true hype in 2017. Since then, VR has been used not only in entertainment and gaming but also in cinema and in artistic practices. There have been numerous filmic experiences that have aimed to shake up the discussion on topical issues, such as the well-known series of humanitarian films commissioned from Chris Milk by the United Nations⁵. These works aim to promote the medium as “the ultimate empathy machine” (Milk, 2015) for its ability to transport the viewer into “an-iconic” worlds and make her experience circumstances that would otherwise not be imaginable. Even in the art world, artists and investors have begun to produce works far beyond the scope of new media art, with mainstream projects involving internationally renowned artists, such as Marina Abramović, Olafur Eliasson, Dominique Gonzalez-Foerster, Anish Kapoor, Jeff Koons, Ai Weiwei, and Paul McCarthy.

However, today VR still represents a promise. More than a gap between expectations and experiences in technical terms, we are now witnessing, after the 2017 hype, a disproportion between the real number of occasions for the use of VR, the debate sparked, and the current economic investment in terms of research and development especially in the direction of immersive technologies in the broadest sense (not only in cinema, visual arts or video games, but also in the most diverse professional sectors: Arcagni, 2020). This fact seems to confirm Haraway’s observation that the promises of technological development act at the political and economic level: despite the fact that today entire segments of the public do not seem interested in VR, or are even suspicious of it, as they have been – albeit for very different reasons – of nuclear energy, the idea of immersion, which this technology interprets in the most literal way possible, has now become the leitmotif of communication strategies concerning any experience that aims to actively involve the audience.

Precisely for this reason, Virtual Reality enters the debate with great force when it becomes an event and interacts with the mass media logic, such as the Hollywood system or that of contemporary art. Two cases above all should be recalled: *Carne y Arena* by Alejandro Iñárritu and *Real Violence* by Jordan Wolfson, both released during the 2017 hype. Millions of characters have been typed about the Mexican director’s installation, and this experience, accessible only by reservation and set up on specific

⁵ The presentation of this initiative is available at: <https://www.youtube.com/watch?v=m-SZzyRFKK8> (accessed: 19/12/2020).

occasions in prestigious museums and exhibition spaces, has quickly become an essential milestone whose success has triggered a wide debate. This is a project that clearly takes sides against Donald Trump's immigration policy (von Becker, 2017): the president himself, according to some people, should have experienced this installation to learn how to empathize more with the lives of those trying to cross the US border (Robey, 2017). Evidently, most of the debate has been based on the paratext rather than on the text, namely on the narration *ex post* of the experience itself, on what was leaked (very little) and on the interviews granted by the director that fuelled aesthetic and political criticism on the topic addressed and on the medium employed. The argument on how to use VR – on its supposed transparency – was at the centre of the debate: on the one hand, were those who exalted it, on the other those who accused the director of do-goodism.

The same controlled accessibility also characterized *Real Violence* (presented as part of the Whitney Biennial in 2017), the shocking work by artist Jordan Wolfson, known for his irreverent research on uncomfortable themes such as perversion, racism, and, indeed, violence. The only video track available online⁶ is the one that shows viewers' shocked reactions to the two-minute VR film. In this controversial experience, the viewer – closely but helplessly – witnesses the brutal, murderous violence of a man (the artist) towards another white man, arousing reviews and comments on the ethical implications of a work of this sort⁷.

3. Enhancing the collective imagination through Augmented Reality

AR art was born political. On October 9th, 2010, Sander Veenhof and Mark Skwarek organized the first virtual collective exhibition, superimposed, without permission, on the concrete spaces of the MoMA in New York and visible through mobile phones. Visitors could see images and 3D virtual objects geolocated both in the rooms of the museum and in the surrounding area. *WeARinMoMA* was created to encourage users to think about the undefined boundary between the concrete and the virtual. The usual everyday environment of a large part of the world's population emerges instead through the intertwining of the two: the digital is real, even though it has a different kind of materiality (Wellner, 2011). As we have already said, technologies such as AR do not aim to replace the environment with alternative virtual worlds: they add electronic characteristics to those already

⁶ This video is available at: <https://www.youtube.com/watch?v=hNIUxXFBrZw> (accessed: 19/12/2020).

⁷ This debate is one of the themes of the documentary film *Spit Earth: Who is Jordan Wolfson?* by James Crump (2020).

possessed by concrete things (Wellner, Mackay and Gold, 1993) or new virtual objects that irrupt into our environment. Thanks to easy-to-use and affordable devices, Veenhof and Skwarek sought to redesign public space through digital creativity. Visitors were also asked to actively participate by installing the works, thereby becoming part of the artistic and curatorial process of the project⁸. Together with the artists who took part in the exhibition (Tamiko Thiel, Will Pappenheimer, Christopher Manzione, and John Craig Freeman), in 2011 Veenhof and Skwarek founded the art collective *Manifest.AR* and published a manifesto justifying interventions that were both artistic and political. The text focuses on the merger of real and virtual, and problematizes the distinction between public and private space. AR Art is a “primitive” art, an “anti-art” with a “viral potency”. It emerges in the “wrong places” because it does not need to receive official authorization, and aims at “installing, revising, permeating, simulating, exposing, decorating, cracking, infesting and unmasking public institutions, identities and objects previously held by elite purveyors of public and artistic policy in the so-called physical real”⁹. The strength of AR art lies in giving the community the possibility to discuss and to participate in political actions. It allows the artists-activists “to combine both the physical experience of the streets and digital experience of the Internet” in order to “place their messages at specific locations any place on the face of the earth and share those messages with others either physically at the site or online” (Skwarek, 2018, p. 3). To give an example, in 2011 more than 25 artists, including the founders of *Manifest.AR*, took part in the Occupy Movement protests, filling the Wall Street area with hundreds of AR artworks. The *Protest.AR APP* allowed activists to place virtual messages and objects on and around the walls of the NYSE (New York Stock Exchange), as in the case of Tamiko Thiel’s *Reign of Gold*, an incessant falling of virtual gold coins that generated a reaction both among the protesters and the day traders, escaping police control operations (Skwarek, 2018)¹⁰.

Critics of initiatives of this kind have pointed out that the AR protest is only visible to those who know that a digital device is required. It would therefore produce a context alienated from the usual one. AR activism would be a form of “armchair” activism (Skwarek, 2018) that guarantees a reassuring mode of participation in protests, far from the place where the actual events unfold and without the risk of being punished for your

⁸ <http://www.sndrv.nl/moma/> (accessed: 19/12/2020).

⁹ <http://www.manifest-ar.art/> (accessed: 19/12/2020). Following the example of *Manifest.AR*, other art collectives have realized projects like *WeARinMoMA*, such as *Mo-MAR*, an unauthorized Augmented Reality art gallery based in the Estée and Joseph H. Lauder Gallery on the 5th floor of the MoMA, and run by Damjanski, David Lobser and Monique Baltzer.

¹⁰ <https://tamikothiel.com/AR/reign-of-gold.html> (accessed: 19/12/2020).

actions. On the contrary, Skwarek emphasizes that AR is a technology that always reaches completion with a physical space, pushing people to go out, interact and engage in dialogue, and allowing them to feel close even at a great distance. The possibility to follow the protest online does not replace active participation in person, but rather expands the number of individuals sensitized and informed about a topic of public interest, fostering greater awareness of certain elements of reality that would not otherwise be visible.

AR, a portable or wearable technology designed to integrate the human body and technological devices, certainly increases and modifies affordances in people's everyday operating space. However, the founders of *Manifest.AR* make no distinction between a work of art and a political operation, and realize both artworks that are less aesthetically and poetically compelling than other, non-virtual ones, and actions of opposition and resistance that are less effective compared to ones carried out in practice.

Since the first experiments, AR art has undergone many changes, also depending on technological developments. Varying considerably in their themes and modes of execution, AR art projects today do not necessarily take the form of political actions. The *[AR]T* project, a collaboration between Apple and the New Museum in New York which involves renowned artists such as Nathalie Djurberg, Hans Berg, and Carsten Höller (among others)¹¹, and the artworks created for the Acute Art App by artists such as Tomás Saraceno, KAWS, and Cao Fei¹², are two possible examples.

However, the political dimension of AR art still survives and can be found in various forms and contexts, with different purposes. AR has become popular among street artists, who in most cases create QR codes, one of the simplest and cheapest ways of attaching virtual elements to the urban physical space. The street artist Sweza, based in Berlin, used AR to make graffiti that had been erased visible again. The project, entitled *Graffyard* (2010), was realized in Berlin and Bologna and consisted in applying a QR code to the places where graffiti had been removed¹³. Using a portable device, the different layers of reality, concrete and digital, past and present, became perceivable at the same time, generating an archive of the memory of city spaces. It is possible to use QR codes also to link audio and video elements to graffiti or to send out a message, as happened with *Cosette* (2016), by the famous Banksy, who depicted Cosette from Victor Hugo's *Les Misérables* on a wall of the French Embassy in London, associating the portrait with a video reporting the police raids in the Calais refugee camp, known as "The Jungle", on the night of January 5th, 2016.

¹¹ <https://www.newmuseum.org/pages/view/ar-t> (accessed: 19/12/2020).

¹² <https://acuteart.com> (accessed: 19/12/2020).

¹³ <http://sweza.com/index.php/arbeiten/graffyard/> (accessed: 19/12/2020).

Cases like these support the idea that AR does not aim to replace the concrete environment but to enhance it with new layers of meaning, intriguing citizens and pushing them to get informed, thanks to a widespread technology that is low-cost both for those who create the artwork and for those who view it. Compared to the examples mentioned above, especially *Manifest.AR*'s collective endeavours, the most recent artworks are not intended to have the same role as a sit-in, but rather to generate a debate and to provide a stimulus for action. A growing number of projects use virtual tools to encourage the community to take a critical look at the city's spaces, by questioning certain historical icons. On October 18th, 2020, the community centre Cantiere, in Milan, placed a statue of Thomas Sankara, the President of Burkina Faso (from 1983 to 1987), in the Montanelli Gardens¹⁴. The statue was subsequently removed because it had been installed without authorization, so the activists replaced it with a statue in the shape of a question mark that, when framed with a mobile phone, allowed the user to see the statue of Sankara on her mobile device. The *Statua che non c'è* (*The Statue That is not There*) has thus become a monument to the removal of colonialism from the collective memory, something we need to become aware of, in order to recognize and discuss it, and to decolonize public places¹⁵ (fig. 3). With similar intentions, in 2021, during Black History Month, the New York-based collective of artists and activists Movers and Shakers will release the *Monuments Project*, an archive of AR monuments dedicated to women, LGBTQIA+ icons and the African American population¹⁶. Users will be free to place them around the city or at home, and by doing this, they will become informed about an alternative narrative of the past.

However, AR is not the prerogative of activists. Institutions that play an essential role in the contemporary art system, and which are capable of deploying substantial budgets, are starting to use it too. In 2019, the Serpentine Galleries in London funded several art projects that made use of digital technologies, including AR. Among them was Hito Steyerl's series of artworks *Power Plants*, *Power Walks* and *Actual Reality*^{os}, focusing on the concept of power, "the necessary condition for any digital technology". *The Actual Reality*^{os} app presents data on the housing, working, and health

¹⁴ <https://www.cantiere.org/33414/la-statua-che-non-ce/> (accessed: 19/12/2020). This initiative is part of a broader protest against the statue of Italian journalist Indro Montanelli (1909-2001), accused of racism and sexism for his marriage to a 12-year-old native girl during the East African campaign in the Thirties. Various associations called for the statue, inaugurated in 2006, to be removed.

¹⁵ In order to avoid its forced removal, the Cantiere activists decided to replace the *Statua che non c'è* with some QR codes, like the one that was on the statue, spread across the Montanelli Gardens.

¹⁶ <https://www.moversandshakersnyc.com> (accessed: 19/12/2020).



FIG. 3. “La statua che non c’è”. Courtesy of the community center Cantiere (Milan)

conditions of the community living in the UK and particularly around the Serpentine, providing a picture of the social inequalities within it. After downloading it on a mobile phone, by framing a series of QR codes around the building it is possible to activate images and audio tracks that give an insight into the actual reality of the population living with the consequences of austerity policies. The digital representation of the museum architecture appears distorted according to the data collected; it visually shows the significant impact of social phenomena and leads the visitor to question the information revealed by the technology. *Actual Reality*¹⁷ is a tool for the visualization of data coming from official sources, a series of research associations, and members of local communities; hence, it is “a collectively-produced digital tool”¹⁷. As Steyerl herself suggests, technology

¹⁷ The correspondent website is hosted at: <https://www.serpentinegalleries.org/> (accessed: 19/12/2020).

is used at the same time by authorities to exercise power, by citizens and artists to generate forms of resistance, and by users to inform themselves and take a stand.

As this artwork shows, it is necessary to critically think about the impact of digital technologies on the contemporary world, by avoiding both a hopelessly (and unproductive) apocalyptic position and naive enthusiasm. For example, artworks hosted by influential institutions are often supported by leading corporations – Apple in the case of the aforementioned *[AR]T* and Google for other AR projects at the Serpentine, such as Jakob Kudsk Steensen's *The Deep Listener* (2019-ongoing)¹⁸. The interests involved in the creative development of digital technologies are not only of a cultural nature. It is worth noting that the absolute accessibility of virtual artworks, based on the assumed democratization of digital media, is not necessarily real. It is undoubtedly true that digital technology is becoming ubiquitous, but in order to use most of the apps already discussed, high-level technological devices are often necessary that not everyone can afford. Besides, smartphones, tablets, glasses, and helmets for virtual reality are programmed to become obsolete even after a few months, posing problems in terms of sustainability, both economic and environmental. Like VR, AR is not only a technology exploited by and for society: its history is closely related to that of military technology, as it has partly emerged via experimentation with gunsights mounted on Head-up Displays in the aeronautical field (Gatti, 2019), and it is now well known that the widespread diffusion of digital technology is being used for population control purposes.

This should not discourage the use of these new technologies in artistic and cultural spheres. On the contrary, given the numerous fruitful aspects that derive from it, we must also be aware of the more problematic consequences of its dissemination in all areas of daily life, from video games to work, in order to cultivate a digital culture and its informed use. Art, and above all its political use, aimed at the construction of a debate involving local communities, is one of the most effective avenues. AR has – and will continue to have – transformative consequences on the lives of individuals, including both those who use it and those who do not and who are inevitably excluded from the experience of certain levels of reality (Liberati, 2018).

At the moment we mostly experience AR artworks through mobile devices; clearly, there still is a frame. Nevertheless, more and more frequently, we find ourselves dealing with “an-icons” designed not only to be observed but also heard and touched, giving us the impression they are part of our concrete environment. As already explained, these works elicit

¹⁸ <https://www.serpentinegalleries.org/whats-on/jakob-kudsk-steensen-the-deep-listener/> (accessed: 19/12/2020).

a sense of presence and immediateness, as if there were no technological mediation involved. We feel immersed in their space of agency and free to interact with them. AR is increasingly moving towards the blending of the concrete and the digital, extending the environment and our experience with real objects, so that sometimes scholars of this subject prefer to use the expression “Mixed Reality”.

Moreover, this technology does not only merge the subject with an environment which is increasingly smart, but also with other individuals, thereby constituting new collective subjects, characterized by shared and interconnected perception, intentionality, and needs, also in real-time (Liberati, 2020).

If only in an alternative way compared to VR, AR is a technology of the imagination, for it externalizes the activity of our imaginative faculty and its products. It allows us to experiment with future operational possibilities in various application contexts, making them visible (in medicine and engineering, for instance). The interactive nature of AR thus implies not only the sharing of the contents of each individual’s imaginative activity, but their concerted production with others, in a collective performance.

Referring to the human tendency to extend the body through technological prostheses, Pietro Montani (2007) discusses the case of those “temporal objects”, such as films, that consciousness assimilates as if they were private memories because they develop in a flux which coincides with that of conscience itself. The cultural industry, which is capable of submitting the same products to millions of people, risks generating a consistent lack of differentiation of individual consciences, which increasingly accept pre-constituted elements. In this case, it would not be a matter of sharing an imaginary world, but of determining a contraction of it, which would necessarily lead to its impoverishment. The radical and constitutive interactivity of AR can instead ensure the creation of a shared image, resulting from collaboration with the surrounding world and with other users.

The user of AR artworks is engaged in a permanent action. She has to discover and produce alternative paths in space and time, in which elements and information from different places, times, and levels of complexity can be assembled in different ways (Valdivieso, 2020). The reading and interpretation of these works necessarily involves their cross-fertilization and sharing, and puts collective responsibility and intelligence at work¹⁹.

¹⁹ In his article, Valdivieso does not explicitly discuss contemporary art in AR, but his reflection, which focuses on the interpretative exercise of the “Hyper-Readers in the Cybercosm of the 21st Century” applies well even to this context.

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