The Internet Does Not Exist

Von Julieta Aranda

Introduction

The internet does not exist. Maybe it did exist only a short time ago, but now it only remains as a blur, a cloud, a friend, a deadline, a redirect, or a 404. lf it ever existed, we couldn't see it. Because it has no shape. lt has no face, just this name that describes everything and nothing at the same time. Yet we are still trying to climb onboard, to get inside, to be part of the network, to get in on the language game, to show up on searches, to appear to exist. But we will never get inside of something that isn't there. All this time we've been bemoaning the death of any critical outside position, we should have taken a good look at information networks. Just try to get in. You can't. Networks are alt edges, as Bruno Latour points out. We thought there were windows but actually they're mirrors. And in the meantime we are being faced with more and more – not just information, but the world itself. And a very particular world that has already become part of our consciousness. And it wants something. It doesn't only want to harvest our eyeballs, our attention, our responses, and our feelings. It also wants to condition our minds and bodies to absorb alt the richness of the planet's knowledge.

There is something we used to call the internet that had an infrastructural base. And it worked a bit like its unconscious, storing alt the things the glowing promises of free flow must repress in order to function. Looking under the hood, it turns out that its infrastructure was mostly based in the United States, mostly owned and operated by the United States. lt was ARPANET that implemented the first successful packet switching network for the US Department of Defense in the late 1960s. From there the nodes slowly grew throughout the '70s and '80s until the network was decommissioned in the early '90s to make way for commercial internet service providers. Even though significant parts of the regulatory infrastructure over information exchange still falls under the oversight of the US government, whether directly or indirectly, the real shift in the 1990s came in realizing the commercial and economic potential of information exchange, placing it at the center of the era of globalization and acceleration in the financial sector.

Of course, the early 1990s also saw the dissolution of the Soviet Union, and it is no coincidence that information networks in the United States were transitioned from a military to an economic function at the same time. This was also the time of US right-wing philosopher Francis Fukuyama's famous declaration of the triumph of Western free market liberal democracy as the most just and emancipatory non-ideology to encompass an entire world finally free of communism. But when we look more closely, we start to see that information networks actually do have an ideological structure.

Here it becomes interesting to note how Soviet attempts under Khrushchev and Brezhnev to develop a nationwide computer network are largely considered to have failed due to Soviet bureaucracy's inability to fully internalize what Norbert Weiner and the American cyberneticists celebrated as the inherently liberal and libertarian values of networks. ln the end, most attempts at a Soviet internet were never able to resolve the question of whether computers and cybernetic concepts were to be used as tools to manage a planned economy or to simply automate information processing tasks. And in the meantime, attempts to establish networks in many cases mirrored and even bloated existing managerial bodies with often secretive and isolated administration systems built specifically not to communicate with others for security reasons. All this in spite of the fact that one of the possible applications of a Soviet internet for a planned economy was the creation of a digital currency that would realize the Marxist dream of eliminating money, supposedly replacing it with a mechanism for registering and allocating resources-a strange reflection of contemporary forms of digital currency such as Bitcoin, or even financial instruments for that matter.

Still, as the story goes, the massive territorial and functional expansion of information networks in the 1990s came to be set up as not only an ideological triumph but also the technical application of liberal democratic concepts onto a planetary-scale economic system. For instance, networks produce, and are produced, by connectedness and free flow between nodes. They enjoy freedom from rigid structure, but only while inside the network and its exchange protocols – emancipation without end, but also without exit. Networks are often assumed to be democratic because they supposedly exist without central command, allowing non-hege-

monic, noncoercive, individualistic freedom of movement, and encouraging some kind of distributed representation. All fine and well, but aren't we now a little suspicious of the all-encompassing inclusivity of these claims? Don't we know now that networks also produce stoppages, closures, dark spots, and their own particular forms of control and governance? In order to understand how these forms of control materialize over networks, it might help to forget this thing we used to call the internet and look at just what it is that travels over the lines. Because what we once called the internet has unleashed something that we don't yet have a name for –possibly because it is made out of language itself. Language has increasingly become a primary currency for exchange-both as a way of explaining how money or financial assets function when they are no longer pegged to material assets that sta- bilize their value and float free, but also to explain the basic substance giving information its spin and its kick. From ones and zeroes moving between terminals to likes and pokes to manifestos and love letters to stock prices, the condition for anything-to enterthe network to become information is that it must first be abstracted into language.

But then how does language work? What is it pegged to? It is pegged to its own ability to create meaning, to its ability to refer to something. But language traveling over networks is not only about expression; it is also about addressing and location. As it was put elegantly in a 1981 DARPA Internet Program Protocol Specification: „A name indicates what we seek. An address indicates where it is.
A route indicates how to get there." This might sound straightforward enough, but it's really not. Because when a location or address – which over a network is an ontological issue of whether something exists, or calls up a blank screen – doubles as a human expression, the ability to orient oneself in a meaningful way starts to melt. Furthermore, when words are put to auction and left to the highest bidder to determine where they point, what they will refer to, we face a scenario where just like with homes in the United States before the market crash, financial speculation will seek to squat a symbolic asset, whether a home or a name, regardless of its function or substance in physical or cognitive domains alike. With this, not only the names of countries start pointing to different laundry detergents, but linguistic meaning in general starts to liquidate and become noise.

It is strange to think how, in spite of so many young artists now playing with digital aesthetics, it was actually Warhol who saw it coming most clearly. The massive shift from depth to surface that Warhol explained with celebrity culture and advertising has now taken hold of language itself and spread across the planet. It's no wonder that since the 1990s the political, social, and economic aspects of artistic production have become increasingly interchangeable and hard to distinguish from one another. Planetary networks have become places of profound confusion and dislocation. We know from the start that we probably won't find what we're looking for, so we learn to search sporadically and asymmetrically just to see where we end up. This might look and feel like drifting, and traditional or conservative notions of substance will always try to dismiss its noise, its cat videos and porn, bad techno and bombastic contemporary art, but one should be careful not to underestimate the massive distances being crossed in the meantime.

These distances are themselves very quickly reformatting our consciousness and cognitive capacity to absorb entire worlds made of contradiction – not only in language but far beyond language as weIl. Some people might already be there: scammers and tricksters, the frazzled post-studio artist and the post-institutional independent militia, political dissidents and unruly journalists who know never to trust their maps. They know that contradictions don't resolve, rather you surf across them using empathy and solidarity, emotional blackmail, jokes, pranks, and vanguardism as norm. Our ability to traverse these contradictions may very well become the backbone of the global telecommunications network we used to think was an internet.[1]

Anmerkungen

[1]Dieser Text erschien erstmals als: Julieta Aranda, Julieta/Wood, Brian Kuan/Vidokle, Anton (2015): Introduction. The Internet Does Not Exist. New York/ Berlin: e-flux and Sternberg Press. Wiederabdruck mit freundlicher Genehmigung der Autor*innen und e-flux.

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The attempt to grasp the present as a general *condition*, that is, to understand the historical specificity of today and transform that understanding into *timely* actions within the present, lies in the heart of modernity. When the world is formed by us (and not through divine inter vention), the present becomes a moment of action: if we want to take our destiny in our own hands, we must act *now* rather than *later*. As a *condition*, the present is inherently contingent: it is a place of contestation where not only different realities coincide, but also where the ten sion between the past and the future is manifested. This is what Hannah Arendt (1961) had in mind when she gave her "six exercises in political thought" the title *Between Past and Future.* Instead of joining tradition and telos (that is, sustaining a continuity between the past to the future), the present presents itself, for Arendt, as a *gap.* Since the attempts to close this gap easily evoke problems (like fascist restorations of a Golden Age), Arendt's task was to write about "how to move in this gap–the only region perhaps where truth eventually will appear"(Arendt 1961: 14). Arendt's book was published 56 years ago, but the question she poses, that is, how to live in the gap between the past and the future, seems still extremely relevant: not only because we are currently experiencing similar totalitarian tendencies that Arendt closely examined in her writings, but also because the *gap-ness* of the present remains as the general rule of life, work, and education today. In an innovation-driven economy, we are constantly waiting for the next big thing (the new Nokia, possibly a two-year grant, a possible shout-out in someone's Instagram page): not because it redeems the present and stabilizes its tensions (e.g. chiliastic waiting for the Second Coming of Christ), but because it ensures that we can make it through the day; that if things are not working out today, we can always try to reinvent ourselves tomorrow; that we can seize the moment only for a moment as easily as we can take an Uber from the gallery to the nightclub.
It is within this gap that I wish to talk about the post-internet, art, and education. The condition it points to, that is, a moment in time when the circulation of information, capital, and affects is increasingly linked to what we call the Internet (a term that is somewhat unnecessary today, since the Internet seems to be *everywhere*), unfolds a present clearly distinguished from the past (e.g. analogue vs. digital; offline vs. online) without, however, clearly defining what kind of future will this present bring with itself (like all ‚post'-definitions: poststructuralism, postmodernity, post-politics; they all seem to leave us in an unnerving *end* of an era). To give this moment an epochal definition is to assign the wide-spread introduction of the Internet the status of a social, cultural, and economic change akin to telegraph, radio, and TV: that the present is an after-effect of a *technological* event that profoundly shaped human activities and cultures. Without going deeper into the intricacies of such claims (indeed, who's epochs, technologies, and cultures are we talking about?), my attempt is to think what kind of *tem poral* (not just technological) conditions does the post-internet (or whatever we want to call it) assign to art and education today. Taking a cue from Arendt's passage above, that the gap between the past and the future is perhaps the "only region […] where truth eventually will appear" (ebd.: 14), I'm interested in how art and education could act in the present and partake in the poetics of its truth.

Let's take, as our example, Ryan Trecartin's *Center Jenny* (2013). When I first saw Trecartin's videos, I thought of Paul McCarthy's video pieces (like *The Painter* [1995]) that present us with repetitive and extreme situations of camouflage, abject, and the everyday. However, while for McCarthy it is his own body that serves as the primary medium of artistic practice – meaning that the camera merely captures these situations – Trecartin (often together with his close collaborator Lizzie Fitch) focuses on the very process of capturing, or better, he mobilizes different paces and places of the digital moving image and its circulation through identities, gestures, and styles. This means that the form and content coincide in his work to the point where *everything* seems to become digital: digital in a sense that characters, actions, and situations are intimately linked with the computational technologies that present their order, appearance, and causality. But this digitalization is not total: the image is still there, vis ible, not rendered into mere digits. This is why I would not like to reduce this computational logic of the digital to a single code or coder, or to go as far as those who seriously believe in the so-called simulation argument; that our world itself is merely a simulation programmed by some other lifeform. Rather, as a cultural, political, and economical *condition*, I see that the digital landscape of the present – one that Trecartin and Fitch draw from – involves sensibili ties that assign a specific kind of contingency to the present: one where the movement within the gap between the past and the future denotes a fluctuating movement between offline--

time/ presence and online-time/presence; a contingency that is not reducible either to digits (i.e. contingency of the code or the coder) or the social in its traditional sense (i.e. the contingency of the social contract). Going back to what I started with – that the present is the primary moment of *action* in modernity – such digital landscape does not undo or change this logic but *intensifies* it: it is immediate activity in the now that confirms the immediacy of the present (that's why, perhaps, people are so eager to use the hashtag *latergram* when they post images that are nonsynchronous with the now). Here, when I say *intensification*, I do not mean *acceleration*. Intensification denotes something what could be illustrated through Snapchat. With Snapchat, the photographic moment has become, yet again, a miraculous moment: not because we can freeze time (i.e. *capture the present*), but because we can synchronize ourselves with a tech?nology that produces the present. *Center Jenny* presents us with a collection of Jennies, who, instead of representing individual characters, are presented as collections of words, postures, voices, and looks: they are, to put it differently, performances that the overlapping gazes of multiple cameras trigger to act. The narrative takes place somewhere in the future where humans have gone extinct: all beings and objects we see are simulations of this extinct, once-organic life and culture; simulations that run and perfect themselves by infinitely repeating their patterns (for the proponents of the sim?ulation argument, this is the true condition of our reality today). Here, we could go to Samuel Delany's queer science-fiction or Lee Edelman's and José Esteban Muñoz's contesting but complementary writings on queer futurities as possible frameworks to discuss Trecartin's image of the future. However, for the sake of my argument, let's stick with the present. In *Center Jenny*, everything happens in interconnected and repeated loops of activity. It is im?portant to note that this activity does not simply refer to individual characters, but to the very milieu in which these characters act. As Trecartin himself put it in an interview,

"We [Trecartin and Fitch] started focusing more on context as being the main charac?ter of the movie, rather than on individual personalities. And we used different charac?ters and their behaviors as tools and utensils for the free will of the context rather than of the individual" (Lehrer-Graiwer 2016, para 47).

This shift of focus from the individual free will to the free will of the context echoes, I believe, the sensibilities I discussed earlier: that the contingency of the present is not solely in the hands of people (offline) or technology (online), but forms through the interplay between different actors (human, non-human, artificial…) and the different temporalities of their actions (move?ment, repetition, frames/kilobytes second). Simultaneously offline and online, the present be?comes a moment of action where it is not clear whether the effects of these actions are virtual or real or both or neither. In order to mobilize this indeterminacy (to move *in* it rather than *with* it), it becomes crucial to explore not only the material conditions of our actions (e.g. online or offline), but also what kind of *times* do these actions occupy. After all, the capitalization of technological time runs precisely by dividing and organizing our offline activities into separate moments online; moments that form the basis for the authorship of individualized lives today (a vanishing Snapchat story and a vanishing Uber contract are basically the same thing). What is needed, then, is an articulation of the present that is not, to paraphrase Walter Benjamin, like a bead in a rosary, but rather a conflation of different times, both online and offline. What *Center Jenny* could teach us, then, is how time in the contemporary could present itself in the gap between offline and online, between the past and the future: multiplied yet centralized, organic yet computed, bodily yet digital. This could be one of the lessons of art after the internet: the poetics of the present is not that much of a world-making but time-dwelling.

So, how does this relate to art education? The history of public education in modernity is concomitant with the understanding of the present as a moment of action. After all, education, it is believed, should prepare students to function in the society by adapting to the present and offer them the means to govern or change it for the sake of the future. Education, in other words, ought to be *timely*: it has to respond to the needs of the present in order to affect the future. The role of art in this logic has traditionally been complementary: whether art is seen as means of self-expression or social reconstruction, art inserts education more comprehen?sively in the present. This, however, means that art education *acts* in the present in a fully affirmative way. It turns learning into a vanishing mediator between the past and the future: a moment of action that constantly undoes itself to keep up with a linear progression of time. This is what grounds the current tyranny of lifelong learning: education, like work, becomes indistinguishable from our existence.
The poetics of the present described above offers a different relation to the present. By in?tensifying the present as a gap between offline and online, it might allow us to understand education as something takes place in a present tense: as the kind of movement that Arendt was after. After all, such movement points to the very event of education: to the relation be?tween learning and unlearning, to the articulation of the otherwise that the present already is. For art educators, such poetics of the present could help to question what constitutes a timely action and how do we act in the present. Instead of conflating offline and online (like Uber or

Tinder; or, in art education, merely replacing paper with tablets), we could try to see what it would mean to keep them in tension (like Trecartin) and what does this tension mean for our understanding of the present.
To summarize, in order to explore art and education as poetics of the present after the internet, we should ask ourselves, how do we understand them as *activities* in the now. In *Human Con dition* (1958/1998), Arendt wrote, "To act, in its most general sense, means to take initiative, to begin, … to set something in motion" (Arendt 1998: 177). Following her, I believe that art and education (both together and separately) can set something in *motion*; in different speeds, simultaneously. This requires an attention to the variety of temporalities they can take up, both online and offline. I do understand that my suggestion to keep the offline and online in tension sustains a binary-relation between these two realms, eventually preventing us from exploring the very condition of possibility of this binary. However, let's leave that question to some other time, to a future to come.[1]

Anmerkung

[1] Dieser Text erschien erstmals in: Tervo, Juuso (2017): Education in the Present Tense. Paper presented at Dank Contemporaneities: One-Day Symposium on the Post-Internet. Online: https://hcommons.org/deposits/objects/hc:16212/datastreams/CONTENT/content [17.03.19]

Literatur

Arendt, Hanna (1961): Between past and future. Six exercises in political thought. New York, NY: Viking Press.

Arendt, Hanna (1998): The human condition. Chicago, IL: The University of Chicago Press, 2nd edition. (Original work published in 1958)

Lehrer-Graiwer, Sarah (2016): Ryan Trecartin by Sarah Lehrer-Graiwer. Online https://bombmagazine.org/articles/ryan-trecartin/ [17.3.19]

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So, wie durch zunehmende digitale Verbreitungsmöglichkeiten die dokumentarische Erscheinungsform oder Reproduktion eines Kunstwerks an Bedeutung gewinnt, vollzieht sich auch bei Ausstellungen, die auf eine Online-Rezeption hin entwickelt werden, ein Shift. Der vormals physische, begehbare aber örtlich gebundene Ausstellungsraum wird zum Produktionsort und die vormals allgemeine Ausstellungsdokumentation wird zur digitalen, nichtbegehbaren,[2] aber global zugänglichen Ausstellung ausgebaut. Verschiebt man also den Ort der Ausstellung in den digitalen Raum, in dem (zumindest vorerst noch) flache Bilder die vorherrschenden Akteure sind, und macht den physischen Raum zum Produktionsraum dieser Bilder, dann verändert sich die Produktion der Ausstellung dahingehend, dass das Kunstwerk für den verlängerten Blick durch eine Kamera (oder ein anderes aufzeichnendes Medium) hin inszeniert werden muss.[3] Kurator*innen[4] werden zu (Bild-)Produzent*innen oder Regisseur*innen, die diesen Blick auf das auszustellende Kunstwerk in seinem spezifischen Setting sowie eine Struktur und Narration für seine digitale Präsentation konzipieren und steuern müssen. Eine digitale Ausstellungsstruktur kann dabei weitaus flexibler (und sogar veränderbar) gestaltet werden als die architektonisch festgelegte Narration oder Struktur eines physischen Ausstellungsraums.[5] Kurator*innen nehmen ferner Einfluss auf das Setting, indem sie einen bestimmten Ort, eine Situation oder ein Szenario für die (Bild-)Produktion auswählen (*Found Setting*), oder ein Setting, im Sinne eines Bühnenbildes (physisch wie digital) herstellen bzw.

anfertigen lassen (*Built Setting*).[6] Das Setting – die Kunstwerke, aber auch eine bestimmte Web-Lösung oder Narrationsstruktur – können jeweils Ausgangspunkt und Angelpunkt des Ausstellungskonzepts sein und haben jeweils Einfluss auf die Auswahl, Produktionsweise oder Produktionsmittel.[7] Kurator*innen müssen also die verschiedenen Wirkweisen und Bedingungen, die die einzelnen Produktions- wie Präsentationsschritte mit sich bringen, technisch und inhaltlich durchdringen, um sie vollständig und kreativ nutzen zu können. Im Falle einer Online-Ausstellung ist also ein Verständnis der digitalen Möglichkeiten und Wirkweisen wichtig, um über die Möglichkeiten des physischen Ausstellungsmachens hinaus denken und agieren zu können.

Die Rezeption eines Kunstwerks kann ferner nie losgelöst von einem bestimmten Setting (physisch wie digital), in das dieses eingebettet ist, stattfinden. Das das Kunstwerk umgebende Setting, meist der Ausstellungsraum, wird in einer reproduzierten Erscheinungsform des Kunstwerks (z.B. als Installationsansicht) mit diesem verknüpft und zirkuliert zusammen mit ihm. Das gleiche Werk zirkuliert somit oft verknüpft mit unterschiedlichen Settings gleichzeitig, etwa, wenn Dokumentationsfotos aus unterschiedlichen Ausstellungen oder Zusammenhängen existieren. Darüber hinaus sind unendlich viele Betrachtungsszenarien möglich. Ein Kunstwerk (oder besser seine dokumentarische Erscheinungsform) kann z.B. anstatt in einer Galerie auch auf dem Weg zur Arbeit in einer U-Bahn in einem Artikel über Preisentwicklungen am Kunstmarkt im Smartphone derdes Nachbar*in betrachtet werden. Die Rezipient*innen, die immer auch Teil eines bestimmten sie umgebenden Settings sind, schauen somit aus diesem oder dieser Betrachtungsebene, wie man auch sagen könnte, auf das Kunstwerk in seinem Setting. Im Falle einer physischen Ausstellung sehen die Rezipient*innen das Kunstwerk immer in einem Raumzusammenhang, dem sie auch selbst angehören (dieser kann zwar geistig ignoriert werden, bleibt aber immer sichtbar). Im Falle einer Online-Ausstellung oder Ausstellungsdokumentation ist der Raumzusammenhang komplexer, schauen doch hier die Rezipient*innen aus ihrem physischen Betrachtungsraum auf eine Reproduktion oder durch ein Wiedergabegerät auf das (inszenierte oder dokumentierte) Kunstwerk in einem anderen Raumzusammenhang; seinem umgebenden Setting. Sie sehen also den Raum, in dem sie sich befinden plus den Raum, in dem sich das Kunstwerk befindet. Darüber hinaus kann das Werk (oder ein Abschnitt daraus) von jeder beliebigen höheren Betrachtungsebene – hier gibt es unterschiedlich viele, die in das Werk hinein und aus dem Werk hinaus verschachtelt sind, z.B. das Kunstwerk plus sein umgebendes Setting (oder das Detail plus umgebendes Kunstwerk, oder das Kunstwerk beschrieben in einem Zertifikat an der Wand der Galerie XY plus umgebendes London des 20ten Jahrhunderts, etc.) – aus betrachtet werden.[8] Das Setting ist also unabdingbar mit dem Kunstwerk verknüpft und muss künstlerisch oder kuratorisch in den Ausstellungskonzepten und der Dokumentation mitbedacht werden.

Durch sich rasant verändernde digitale Zirkulationsmechanismen hat sich auch der Stellenwert der Ausstellungsdokumentation verändert, die heute im Gegensatz zum begrenzten räumlichen Rezeptionserlebnis von Kunst viel weitreichender und zugänglicher rezipierbar ist. Der signifikante Unterschied aber zur bloßen Ausstellungsdokumentation besteht bei einer Online-Ausstellung in der bewussten Ausformung und Verbindung der Inszenierung der Kunstwerke im jeweils dafür gewählten Setting (*Image Production*) und des Präsentationsrahmens und Online-Konzepts (*Web Solution & Narration*), im Sinne des kuratorischen Gesamtkonzepts der Ausstellung, welches eine mehr oder weniger immersive Rezeptionserfahrung ermöglicht. Die Dokumentation in diesem Falle ist mehr oder weniger identisch mit der eigentlichen Ausstellung, da hier, wie bei der Übertragung einer physisch räumlichen Ausstellung, in zweidimensionale verbreitbare Bilder (*Sharing & Circulation*) keine Umwandlung in eine andere Dimension oder einen anderen Aggregatzustand stattfinden muss. Die ohnehin online gezeigten Bilder können direkt zirkulieren, allerdings werden sie eventuell aus ihrem Ausstellungshabitat oder ihrer Narrationsstruktur gerissen und damit wieder zu bloßen losgelösten Dokumenten.[9] [1]

Anmerkungen

[1] Dieser Text erschien in kürzerer und englischsprachiger Fassung in ONCURATING.org, Issue Digital Communities.

[2] Im Falle einer VR (Virtual Reality)-Lösung kann man allerdings in gewissen Sinne von begehbar sprechen. Der digitale Raum wird in Zukunft ebenso begehbar wie der physische Raum.

[3] Der digitale Raum kann auch zum Produktionsraum werden und ein digitales Kunstwerk wird auch immer in einem bestimmten Setting präsentiert. Weiterhin stellt sich die Frage, ob in diesem dazugewonnenen Produktionsstadium die Neutralität nachgeordneter Präsentations- oder Dokumentationsschritte reproduziert werden muss, oder ob es nicht sinnvoller ist, den künstlerischen Prozess hier oder generell auch in allen anderen gestaltbaren Stadien weiterzuführen.

[4] Die Kuratorin bzw. der Kurator in einem weiten Verständnis als Ausstellungsmacherin bzw. Ausstellungsmacher.

[5] Coder*innen oder Webdesigner*innen werden damit zu Ausstellungstechniker*innen oder -architekt*innen.

[6] Auch können unterschiedliche, mehrere oder sich ändernde Settings für Produktion und Präsentation zum Einsatz kommen, - soweit diese Teil des kuratorischen Gesamtkonzepts sind.

[7] Im Falle von *New Szenario* waren vorwiegend speziell gewählte Settings Ausgangspunkt der Ausstellungsprojekte, die durch ihre Beschaffenheit verschiedene konzeptuelle Entscheidungen beeinflusst haben (vgl. www.newscenario.net).

[8] Die Rezipient*innen können sich also nur in der selben räumlichen Betrachtungsebene befinden, in der sich auch das Kunstwerk befindet, oder aber auf einer nächst höheren Ebene, von der aus sie ihrem sie umgebenden räumlichen Setting auf das dokumentierte Kunstwerk plus dessen umgebendes Setting schauen. Spielen also übergeordnete Betrachtungsebenen für die Ausstellung eine besondere Rolle, müssen sie besonders mitgedacht werden. Keine Rolle spielen sie nie. Für die künstlerische Produktion heißt das auch, dass außerhalb des Kunstwerkes liegende Betrachtungsebenen mitgestaltet werden können, bzw. Einfluss auf die Betrachtung des Werkes haben, ähnlich wie Bildführung und Komposition innerhalb einer Malerei.

[9] Bei einer Umwandlung digitaler Ausstellungsbilder in eine physische zweidimensionale druckbare oder dreidimensional präsentierbare Version, ist es möglich, die umgebende Struktur, also das digitale Setting wie z.B. den Browser, mit abzubilden, oder sie mit dem Abspielgerät, z.B. dem Computer, im Raum zu zeigen.

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Abstract

From 2018 to 2021, the EU-funded project *AURORA School for ARtists* at the University for Applied Sciences (HTW) Berlin offers artists and other creative freelancers a wide range of training courses on Augmented Reality (AR), workplaces equipped with hard- and software (at least until 2020), as well as support by AR specialists to digitally expand their analog works. How can such a project succeed? How far can artists go together with their tutors to implement their concepts and where do they reach limits? Finally, to which conclusions does the experience in the AURORA training for arts and culture professionals lead? The paper will provide information with a focus on the development of artistic AR applications as an interplay between technical feasibility and creative process.

Introduction

The use of mobile augmented reality (AR) in art celebrated its tenth anniversary in 2020: with the market launch of AR-compati-

ble smartphones in 2009, artists who discovered this technology as a new medium have been appearing since 2010. Among them were Tamiko Thiel and Mark Skwarek, who were to be among the founding members of the first AR artists' group *Manifest.AR* in 2011. The first mobile AR art was politically engaged: with actions such as logo hacking in public space and an AR guerilla intervention at MoMA New York, it drew attention to violations such as environmental catastrophes and to the established art canon (see Skwarek 2018). The expectation formulated by Jung Yeon Ma and Jong Soo Choi in 2007, that AR would prove valuable for artistic applications, came true in artistic practice shortly afterwards (see Jung/Jong 2007). Meanwhile, AR no longer needs guerrilla actions to get into art and cultural institutions: most institutions that want to keep pace with digital innovations have AR in their repertoire, whether in the form of AR art, of mixed reality installations and performances, or for education purposes or as guidance systems.[1]

AR software and platforms today offer more possibilities than they did ten years ago. But to achieve individual results of high quality, an extensive knowledge of digital media production and programming often is necessary. There is a tendency towards interdisciplinary cooperation between cultural institutions or established artists and computer scientists – assuming the appropriate budget is available. This is normally not the case with freelance arts and culture professionals who are interested in using AR to expand their work. To counter this, the EU-funded *AURORA School for ARtists* at the HTW Berlin offers training courses on AR where freelance arts and culture professionals can learn the basics of the technology themselves. The HTW project also provides an AR production laboratory, where artistic AR applications can be implemented with support by experts of the project team. As a pioneer project in Germany, the *AURORA School for ARtists* has transformed into a think-tank for arts and AR, where technical realization and creative processes go hand in hand.

The paper begins with a brief overview of the HTW project's starting point by focusing on the technology's state of the art, the current situation in Germany's independent art scene and existing courses on AR at art academies in Germany and beyond. It then directs attention to the interdisciplinary development of artistic AR applications in the AURORA production laboratory, leading to conclusive reflections on the artistic training in this technology that is predestined to merge the analog with the virtual reality.

Augmented Reality – The Point(s) of Departure
The state of the art

While many early AR applications have been developed from scratch, the current trend is to build AR apps using traditional game engines like Unity or Unreal Engine. Unity claims that 60% of all AR/VR apps are powered by its engine (see Unity Technologies 2018). Using game engines makes sense, as they already provide most of the components necessary for creating immersive 3D worlds, e.g. graphics rendering, audio, video playback and physics, enabling creators to quickly develop AR prototypes.

Until recently, most AR software used visual markers to anchor virtual objects in the physical world. Using algorithms from the domain of computer vision, natural features (e.g. corners) are detected in a reference image. The algorithms then continuously search for such feature patterns in the camera stream of a mobile device to detect and track the occurrence, position and orientation of the reference image in order to place the virtual content (see Park et al. 2005). Multiple vendors like *Vuforia* or *Wikitude* provide such algorithms as includable libraries, which can be used in game engines to provide the image tracking capability of AR apps.

With the advent of Apple's ARKit (2017) and Google's ARCore (2018) it is now also possible to place virtual content anywhere in the environment without the need for visual markers. Users can walk freely, while virtual objects are stably positioned in the physical world.
The technology behind this, called visual-inertial odometry, continuously maps the environment and keeps track of the device's position and orientation within this map by analysing consecutive camera images (see Li/Mourikis 2013). Unfortunately, Apple and Google develop their libraries ARKit and ARCore only for mobile devices. Thus, it is currently very complicated to search for bugs in ARKit/ARCore applications in a game engine editor on a PC.

Besides smartphones and tablets, consumer AR glasses like the *Microsoft HoloLens* or the *MagicLeap* have been available since 2016, albeit for high prices. AR glasses have the advantage of placing virtual content directly into the user's view without a noticeable screen between them and the environment, thus creating a stronger sense of immersion (see Bach et al. 2017). Because the hands have been freed from holding a mobile device, AR glasses also support more intuitive interaction using hand gesture recognition (see Microsoft Corporation 2020). One of the main drawbacks of the current generation of AR glasses is a limited field of view, resulting in virtual objects being visually cut off (see Bach et al. 2017).

To ease the development for different devices, in 2018 Unity started to develop its own library, ARFoundation, which hides the implementation details of ARKit, ARCore, MixedRealityToolkit (*HoloLens*) and the Lumin SDK (*MagicLeap*) behind a shared API and user interface (see Weiers/Durand 2018). ARFoundation provides image tracking and visual odometry. Due to the limitations of ARKit and ARCore, specific mobile devices are necessary for testing, which increases hardware costs and slows down the practical exercises. That is why ARFoundation is only used in the AURORA production laboratory, but not in the workshops. The near future will bring at least two crucial enhancements for AR software. First, various companies like Google and Facebook are currently developing visual positioning services, which allow to track user positions and orientations far more accurately than GPS – indoors and outdoors – and as such making location-based AR more feasible (see Reinhardt 2019; O'Hear 2020). Second, the continuous effort of the World Wide Web Consortium to specify WebXR will soon bring AR to (mobile) browsers. This has the grand advantage that users don't need to install AR applications on their devices and in turn lowers the entry barriers (see Bozorgzadeh 2018).

The situation in Germany's art scene

When the AURORA project started in April 2018, there were already several stakeholders in Germany's art scene working with AR as an artistic tool or giving it a public platform. Successful digital artists such as Tamiko Thiel and the duo Banz & Bowinkel attracted Germany's art scene's attention to AR as a futuristic artistic medium adding a digital layer to our physical world. The tool has a high potential not only for the democratization of the art world (see Thiel 2018), but also for the exploration of questions arising with technological innovation in the field of a seamless combination of the analog and the digital world in a Mixed or even Hyper Reality.[2] Respect is due to AR pioneers, who had to educate themselves in the complex technology: before 2018 there were no further education offers for artists in AR. But there have been several curators supporting and exhibiting digital art forms such as Virtual Reality (VR) and AR: Wolf Lieser has regularly shown AR and VR artwork in his DAM projects[3] in Berlin that emerged from the Digital Art Museum (DAM) – one of the first galleries to establish digital art on the market –, e.g. by Carla Gannis in 2017 and Banz & Bowinkel in 2019. Tina Sauerländer, Peggy Schoenegge and colleagues run the platform *peer to space* focusing on AR and VR artwork and exhibitions. Together with Philip Hausmeier, Tina Sauerländer is also is the cofounder of *Radiance*, the research platform and database for VR experiences in the visual arts, which includes some AR art made for the AR glasses *HoloLens*.[4]

Since 2017, the AR tool *Artivive* has been offering artists the opportunity to easily augment their work with digital images and videos.[5] In 2019, *Adobe* also published its own AR platform *Adobe Aero.* Providing combinable algorithms such as "walk" or "jump", it lets you determine the behavior of uploaded digital content (such as 3D models) to a certain extent.[6] The more individual results such intuitive tools allow, the more artists will work with them autonomously. But the digital content still has to be produced separately or prefabricated assets must be used.

In the field of events, festivals such as the *VRHAM!* in Hamburg and the *Virtual Worlds Festival* in Munich were launched in 2018 and 2019, awarding prizes for immersive art experiences.[7]

In 2018, AR art also arrived in established German museums: an exhibition on *Mixed Realities* took place in the Kunstmuseum Stuttgart, exploring how artists deal with this new setting of realities by using the corresponding technologies.[8] But the exhibition in Stuttgart also revealed new challenges in terms of presentation: how to exhibit AR art in such a way that visitors understand what needs to be done? In *Mixed Realities*, many visitors just ignored the tablet on a socket that was meant to augment the art

of Tim Berresheim. The Kunsthalle München of the Hypo-Kulturstiftung and the Ludwig Forum für Internationale Kunst in Aachen presented an exhibition with the title *Lust der Täuschung – Von der Antike bis zur Virtual Reality* in 2018/19 (see Beitin/Diederen 2018).

A quite new phenomenon is the English high-profile company *Acute Art*, directed by the curator Daniel Birnbaum since 2019: *Acute Art* invites renowned international artists like Marina Abramović or Jeff Koons to cooperate with them in order to produce elaborate XR artworks. Some of them were shown in the Julia Stoschek Collection Berlin in 2019/20,[9] which emphasized the importance of EU-funded projects like AURORA in order to provide support also to the independent art scene and subcultural low budget projects.

In 2020, the coronavirus led to a rapid increase in digitization, which in turn gave impetus to an impressive variety of new experimental digital art approaches in Germany – e.g. the project *unreal.theatre* (funded by the German Kulturstiftung des Bundes) where performing artists interact in the social space *VRChat*, which was originally developed for VR gamers.[10] Meanwhile, the project IN VR WE TRUST brings a critical point of view to the reception of VR art.[11] In the AR field, the NRW Forum Düsseldorf together with the Kunstpalast announced the first German AR Biennale,[12] and the *AURORA School for ARtists* plans a final exhibition – both are planned for autumn 2021. Not least, Covid-19 has enhanced public arts and culture funding on digital formats. As a result, we may expect many more exciting AR art experiences in the near future.

Augmented and Virtual Reality in artistic education

As you might have noticed in the previous chapter, VR and AR technologies are often presented and thought of together. On the one hand, the experience and the applied hardware are still quite different: Whereas VR allows total immersion into the virtual world, AR still lets you perceive the analog world. AR applications are usually developed for smartphones and tablets (AR glasses such as the *HoloLens* are very expensive) – for VR applications you need VR glasses or at least a cardboard box in combination with a high-end smartphone. As a result, there are strong conceptual differences. On the other hand, in theory they are both part of the *Reality-Virtuality-Continuum* by Milgram and Kishino (1994) – and there are also similarities in the practice: As both technologies rely on game engines such as Unity, especially from the developer's point of view they are 95% similar.[13] Furthermore, AR and VR glasses will one day merge in one Mixed Reality hardware: The *HoloLens* gets an ever-larger field of view and better color coverage to overlay the analog world, while VR glasses now have integrated cameras to include the outside world. Thus, especially in the field of application development, not only separate but also combined AR and VR courses make sense.

AR and VR first had to prove themselves as serious artistic media before being accepted into teaching at art academies. There are various courses at US American art academies, such as the School of Visual Arts New York, the Columbia College Chicago or the Hunter University of New York.[14] In Europe, more and more institutions such as the London College of Communication offer courses or master's degrees of Design in both AR and VR.[15]

Even though there was no AR/VR professorship at German art academies in 2019/20, we observe more and more talks, seminars and workshops on both technologies. To mention a few examples, the Hochschule für Bildende Künste Hamburg offered a lecture series on *VR und AR und Immersion in der aktuellen Kunst- und Designproduktion* during the winter semester 2019/20.[16] At the Academy of Media Arts (KHM) in Cologne, students experiment with the technologies within their student's projects and expand creative projects such as exhibition posters with AR. They are supported by the professors Melissa de Raaf, Zil Lilas and Tania de Leon Yong. In order to provide technical and curatorial support for their students, they plan new partnerships with other institutions and museums. The Burg Giebichenstein in Halle offers a study program named *Multimedia | VR Design* (B.A.).[17] At the HTW Berlin, the research group INKA works in the field of AR and VR for the art and culture sector offering also student's projects.[18] In the field of computer science, the study program *Informatik in Kultur und Gesundheit* will start at 1 October 2021 at the HTW Berlin, offering one course on Mixed Reality. Students of communication design could attend Pablo Dornhege's semester program *Zwischenwelten – Schnittstellen zwischen Virtual Reality und physischer* Welt in 2019/20.

Seen from an institutional perspective, design disciplines are slightly more open for interdisciplinary XR studies than the traditional arts, and media art academies as well as universities of applied sciences involve XR technologies more rapidly in their curriculum than traditional art academies. What might be the reasons for this? In addition to their stronger focus on new technologies, there are also some parallels between the UI and the logic of digital media production software – such as After Effects, Blender or Premiere – and the Unity editor. As we could also observe in the AURORA workshops, the entry barrier for professionals of digital media production to *Unity* is lower than for analog artists such as painters or authors. Another advantage for designers and media artists: They can use their individual digital media – such as 2D and 3D models or animations – for the AR layer. Not least and as explained above, with ARKit and ARCore you can place virtual content anywhere in the environment without the need for visual markers – which means that digital media artists don't even necessarily need an analog artwork to show their digital art in AR. As a consequence, the implementation of XR course and study programs at educational institutions offering media production courses absolutely makes sense. But what about interested arts and culture professionals who cannot benefit from these seminars or (upcoming) study programs?

Closing the Gap: The AURORA School for Artists

AURORA is a project of the INKA research group led by Prof. Jürgen Sieck at the HTW Berlin. Before the project started in April 2018, there had been no training program about AR tailored to the needs of arts and culture professionals in Germany. Especially in this area of training for freelancers in Berlin – forming the target group due to EU funding –, the project came at the right time and could definitively close an important gap in Germany's art landscape. From the beginning of the project until the end of 2020, the *AURORA School for ARtists* at the HTW Berlin counted 485 participants in its AR workshops and talks. Most participants were visual artists – but the events have also been attended by authors, performing artists, illustrators and designers. So far, 17 individual AR applications have been implemented in the production laboratory. In close one-to-one-cooperation with the project's AR and media production experts they have been realized by the following artists: Banz & Bowinkel (multimedia art), Annagul Beschareti (fine art), Phyllis Josephine (multimedia art), Olga Lang (literature) & Julia Laube (performing arts), Bianca Kennedy (multimedia art), Sarah Müller (design), Dani Ploeger (multimedia art), Theresa Reiwer (performing arts), Peter Sandhaus (sculpture), Dagmar Schürrer (multimedia art), Juliane Wünsche (literature), Anke Schiemann (multimedia art), Ulrike Schmitz (photography), Robert Seidel (multimedia art), Ariane Stamatescu (performing arts), Anke von der Heide (media architecture), and The Swan Collective (multimedia art).[19]

The AURORA training program

The *AURORA School for ARtists* offers five one- or two-day training courses on AR and media production. They take place twice a year and are free of costs.[20] The courses build on each other and can be combined depending on previous knowledge and on how intensely the participants want to immerse themselves into AR. In cooperation with other projects, the AURORA team also organizes one-day workshops for special professional groups such as designers or performing artists. After attending at least two courses on the development of AR applications with Unity and Vuforia (with/without coding) and the concluding production lab course, the artists can apply for a workplace in the AURORA production laboratory. Here, they work with their personal tutors to implement their own AR application within three to six months. To save license costs, results can also be published under the INKA research group's own AR app *INKA AR*.[21]

Due to the coronavirus, the last face-to-face-courses took place in March 2020. Since then the AURORA team has worked on its basic AR program *AURORA Digital*. It consists of fifteen video tutorials in German that can be found **on** the AURORA website and on *Youtube*.[22

The development of artistic AR applications in the AURORA production laboratory

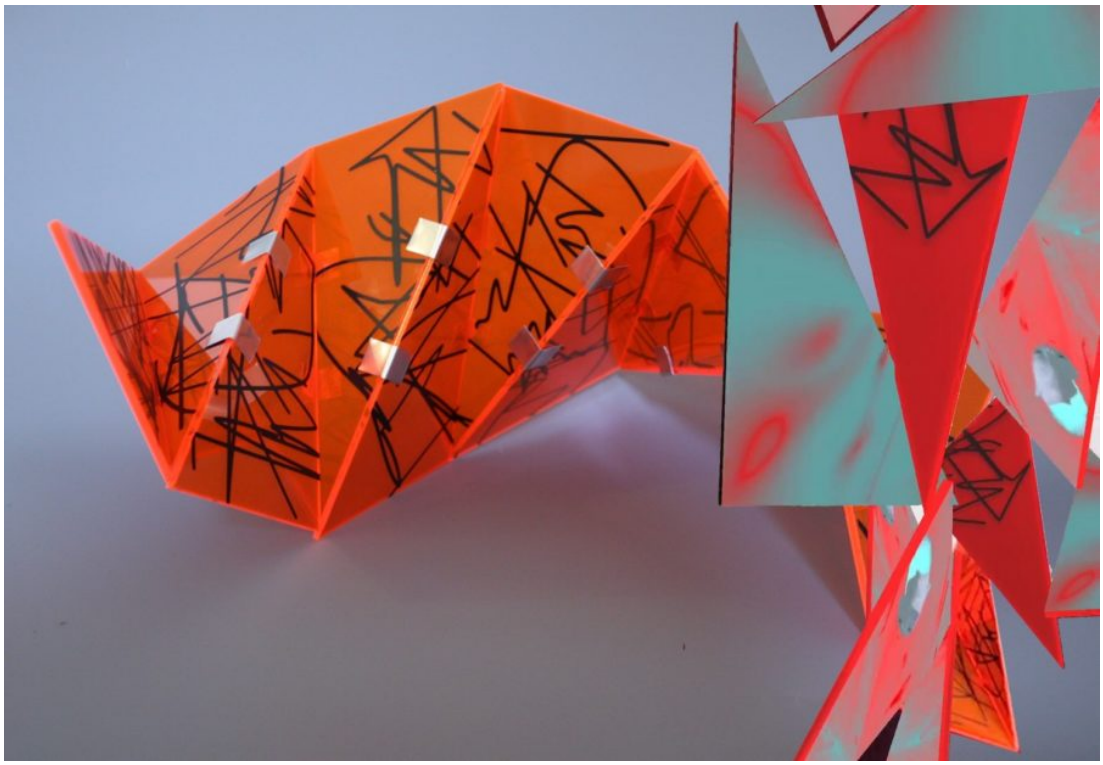

Figure 1: Dagmar Schürrer, Untitled (Von der Fläche zur Form), 2019, augmented sculpture, 40 x 25 x 20 cm. Photo: © the artist.

In 2018/19, the video artist Dagmar Schürrer had a workplace in the AURORA production lab. Her initial idea for an AR artwork was an origami-like object made of acrylic glass and emanating a futuristic and yet enigmatic aesthetic. It looked almost as if somebody had thrown it through the window of a screen as a message of the digital world to be decrypted by its rhythmic hatching. And indeed, technically speaking the hatching, together with the object's form, should be recognized by the software *Vuforia*, triggering an additional layer of digital content: The sculpture serves as a multifaceted 3D screen showing parts of Schürrer's video *Seeking Patterns* (2019) as AR. The AR video fragments should then dissolve from the sculpture and expand into the three-dimensional space. With this concept, the video artist took up the idea of Expanded Cinema, which from the 1960s extended film material into flowing pictorial worlds in order to make it tangible in a new, sensual-aesthetic way (see Beckmann 2015). At the same time, Schürrer asked: "How far can this intention be realized with the new technical possibilities of object recognition and extension by means of AR?"[23]

The approach was convincing – but due to the state of the art at that time, the technical realization was anything but perfect: Although many tests were done to find the best solution, *Vuforia* wasn't able to lay the different videos exactly on the multi-angled planes of the sculpture. The technology had promised more than it could deliver. Only one year later, the new platform ARFoundation would have made the synchronization much easier, because it shows a reference of both the object and the projector in the Unity editor.

As such, Schürrer's AR concept was ahead of its time. In the end, the artist chose a new approach to spatially extend her video work: In *Virtualized AR* (2020), the AR layer is triggered by film stills of the video shown on a diagonal single screen on a self-built table, the new object. Like in a reverse mirror, the AR layer above the object shows motifs of the video *Virtualized* in form

of moving 3D models expanding into the room (see Schürrer/Stark/Barsht 2019).

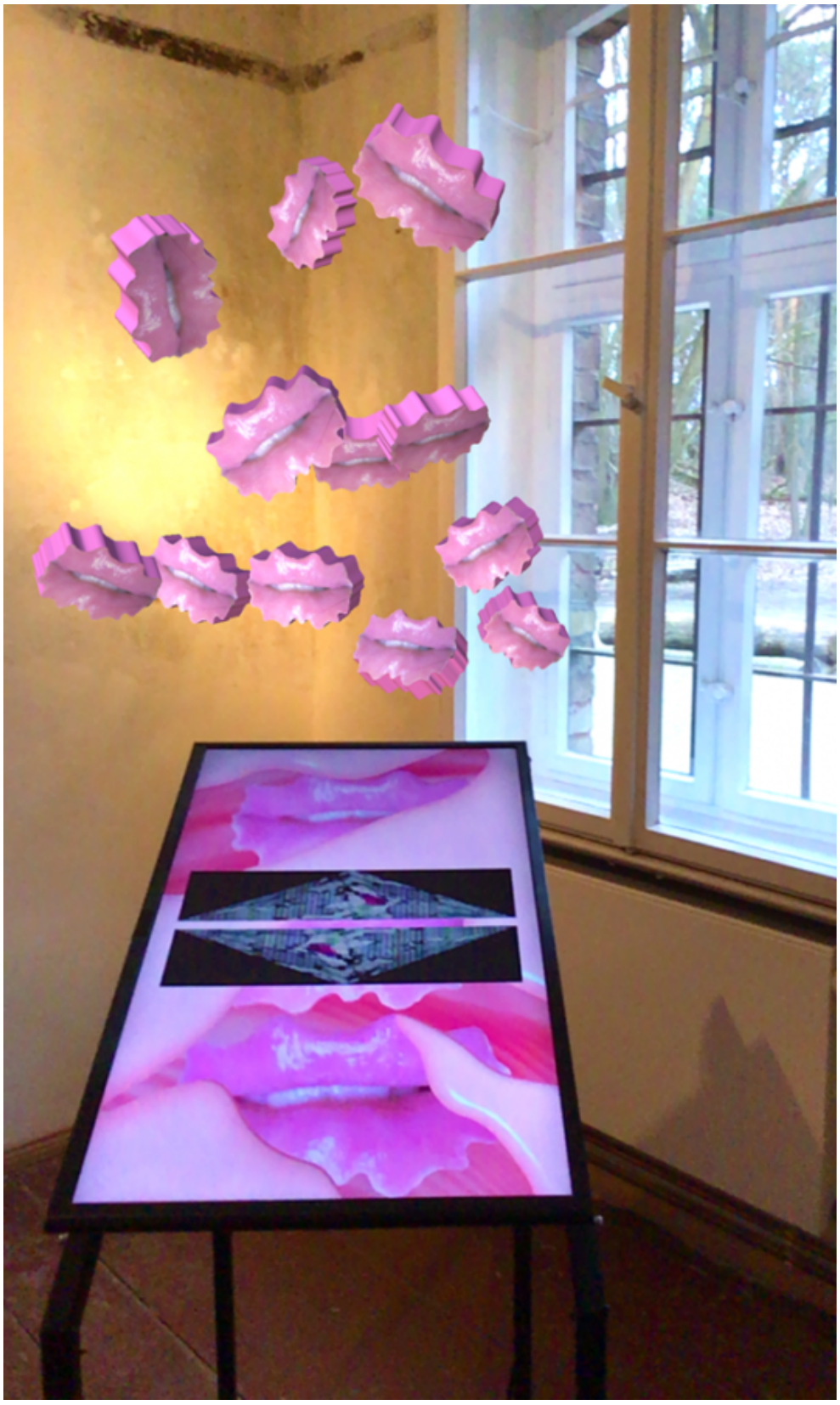

Figure 2: Dagmar Schürrer, Virtualized, 2020, AR video installation, two monitors, 10:55 min. Photo: © the artist.

As *Virtualized AR* has shown, the development of artistic AR applications is always a productive interplay – and sometimes struggle – between technical realization and creative process. Regarding AR as an artistic medium such as video, it has its own qualities and limits – and it will always influence the artistic result. The extent of this influence also depends on ongoing technical innovations and the artist-developer's skills with the technology. As mentioned before, there are not many courses on XR technologies at art academies yet. In the field of workshops for arts and culture professionals, the *AURORA School for ARtists* closed a gap. In this context, one has to consider that most of the AURORA participants have not yet worked with AR technology.

During a study with twelve AURORA artists (including two duos) in 2020, almost all of them stated that their concepts and ideas changed the more they deepened their knowledge about the technology in cooperation with their tutors.[24] On the one hand, this could mean a restriction – in the best case the artists could adapt their concepts to the technical limitations in a creative and productive way such as Schürrer, but also Theresa Reiwer: Her AR work *TOVIAS* is part of a narrative space – an analog room specially built by the artist and presented in 2019 (Reiwer et al. 2019).[25] The narrative of the immersive installation is advertised as a Smart Home prototype of the SLOW ROOMS series. The theatre guest is invited to test this Smart Home and its „certified relaxation tools" (brochure) in absolute isolation. Its latest feature is *TOVIAS*: The „Tool for Virtual Associate", an add-on that ensures that you never feel alone in a SLOW ROOM – unless you want it to, then you just switch it off – an installation that is more topical than ever before during the coronavirus pandemic and that empirically explores whether the basic human need for society is really so easy to satisfy.

Originally, *TOVIAS* was planned to take normal steps. But due to the complexity of the animation system, the virtual roommate moves short distances by taking many fast and tiny steps: He scurries. How could this problem be solved? The artist kept this original glitch as part of the concept.

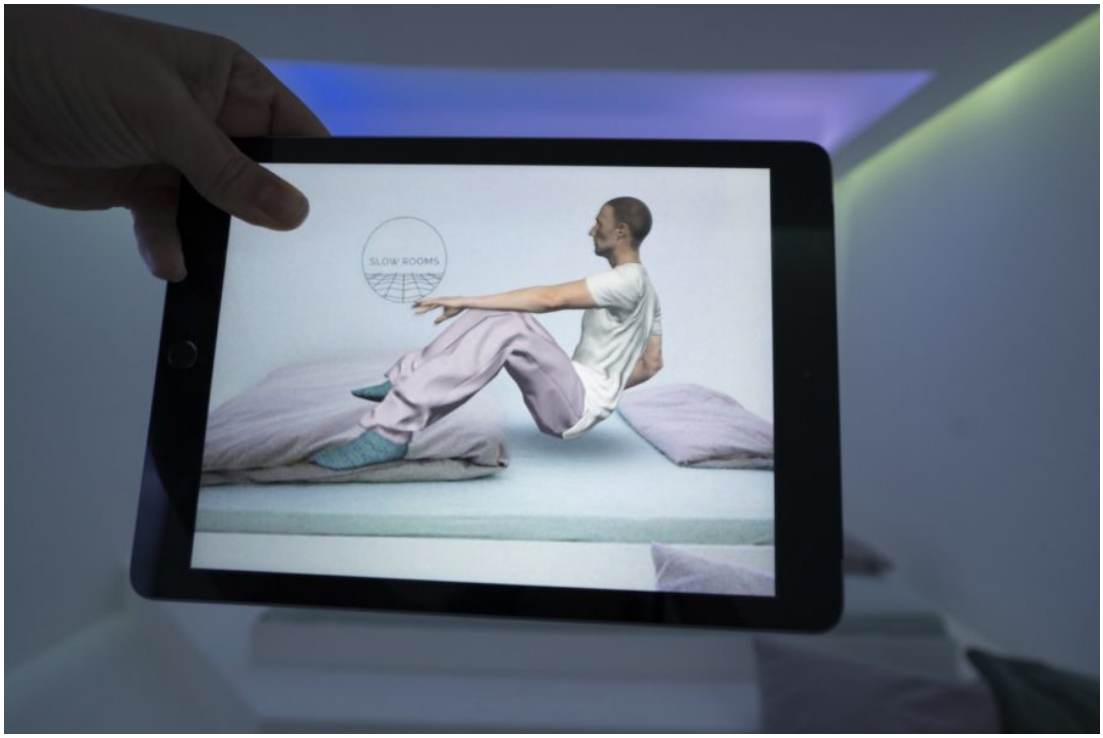

Figure 3: Theresa Reiwer, TOVIAS, part of AR room installation, 2018/19. Photo: © the artist.

On the other hand, the deepened technological knowledge led to an extension of the possibilities that the artists had not thought

about before and that inspired them to enrich their concept. This was described most vividly by author Juliane Wünsche: Asked to what percentage she was able to implement her original concept, she answered “120 percent”! Together with her AURORA tutor Leonid Barsht, she developed *Zittau 1999.* This AR application augments her novel *Nationalbefreite Zone* with additional historical, political and economic information. Especially in the field of *interaction* with the digital objects in the AR layer, a lot of new ideas arose during the interdisciplinary development process, e.g. a wipe function – a photography can be wiped away and a new image appears underneath – or the usage of a computer-generated 3D model of a projector that shows a slide show of the history of Zittau.[26]

These kinds of playful interactions are perfect for engaging and delighting the recipients – they are one of the main advantages of AR in art and art education, as can also be seen in the faces of the viewers of another interactive work produced in the AURORA production lab: Bianca Kennedy’s augmented drawing of a bathing scene, *Swimming with the Lovers* (2018/19), where you can evoke and then remove almost all AR components – analogue 2D drawings that are spatially arranged – by touching the screen. Each tap also leads to a surreal metamorphosis of the protagonist.[27] Wünsche’s and Kennedy’s applications can both be found in *INKA AR*.

Figure 4: Artists and AURORA team members interact with Bianca Kennedy’s AR drawing *Swimming with the Lovers* (2018/19) during a Retune Studio Visit at HTW Berlin. Photo: © Nushin I. Yazdani | *Retune.*

After their time in the laboratory, the twelve participants were interviewed and asked how far they got in implementing their original concepts: on average, this was 90%.[28] Technical restrictions and a lack of time were the main reasons when 100% was not achieved. The high percentage of 90% is due to the exclusive one-to-one-support, but also to creativity of the artists and the project’s five computer scientists (two of them students) who supported them as their AR tutors.

In the AURORA production laboratory, technical realization and creative process went hand in hand. Their interplay in the artistic practice has already been exemplified. But what about the computer scientists’ part? Usually, their creativity is focused on technical problem solving which again influences the artistic concept (as shown by the examples above). Similar to the artists, the AR

specialists' creativity also consists of selecting the appropriate material, but in terms of finding the most sensible approach/interfaces, components and plug-ins. Furthermore, computer scientists help to transfer the artistic to coding concepts in terms of building the program and structuring a flexible yet easy-to-use API. Last but not least, "beauty is in the eye of the beholder" (Hungerford 1878: 100). Computer science has its own aesthetic,[29] which is manifested in the choice of the best programming formulation being both elegant and readable: a 'beautiful code' is smart and structured clearly, it follows the coding conventions, is commented and comprehensible for other programmers, maintainable and expandable.[30] This beauty is invisible for the users – and at first glance not too important for the artists –, but it is important to computer scientists and crucial for the performance of an application. And who would want to have an artistic AR application that doesn't work well? The more complex an artistic AR concept is in terms of (inter-)actions, the higher the likelihood that at least a little programming is necessary. After a two-day programming course as part of the AURORA training, nobody expected that the artists in the AURORA production lab would do this completely independently. But the more previous knowledge they had and the more ambitiously they worked with the technology, the more progress they made. One third of the twelve interviewed artists said that they would continue to use the Unity editor including some programming.

Conclusion: Reflections on Artistic Training in Augmented Reality

The enormous interest of artists and other cultural professionals in the EU-funded AURORA project at the HTW Berlin clearly shows an urgent need for continuous Augmented Reality (AR) course offerings being tailored to their needs. In the area of training for freelancers in the independent art and culture scene in Berlin, the project could close an important gap. AR is the perfect breeding ground for a creative process of both artists and computer scientists, a permanent interplay of thinking and rethinking both artistic and coding concepts as well as technical feasibility.

The last three years of AURORA have shown that artists appreciate modular courses that they can combine individually. In addition to the current workshops, lectures on AR storytelling and ethical aspects based on philosophical studies would definitely make sense. This is also our recommendation for future course and study programs on AR and also VR art. These should best be implemented at media art academies and universities of applied sciences, where they can be combined with existing courses about digital media production and development with game engines such as Unity.

For art students with a strong focus on analog materials and body work, free courses like the AURORA workshops would be a reasonable complement to their regular studies. Visiting professors and guest lecturers are also a good idea. However, the analog artists' main focus should not be on technical development, but on a theoretical and philosophical framework, on examples and experiments with the technology. Finally, analog artists should become familiar with interdisciplinary workflows and networking, bearing in mind that they will at some point need interdisciplinary teams for discovering the expanding world of artistic expression in the Extended Realities.

Acknowledgements

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Annotations

[1] E.g. *Virtuelles Konzerthaus* by HTW Berlin project APOLLO in cooperation with the Konzerthaus Berlin, Germany, since 2015; *ArtLens-App*, Cleveland Museum for Art, Ohio, USA, since 2016; exh. *ORLAN Videorlan – Technobody*, Museo Macro Rome, Italy, 2017; exh. *Mixed Realities*, Kunstmuseum Stuttgart, Germany, 2018; the art education project *Hyperlink* on the exh. of Joanna Piotrowska, Kunsthalle Basel, Switzerland, 2020 etc.

[2] For terms and concepts such as Mixed and Hyper Reality see e.g. the *AURORA Digital* video tutorial. Online: https://aurora.htw-berlin.de/aurora-digital/ [04.01.2021]. For Hyper Reality see also the artistic video by the film maker Keiichi Matsuda (Matsuda 2016).

[3] DAM Projects. Online: https://damprojects.org/ [30.12.2020]

[4] Radiance. The international research platform for VR experiences in visual arts. Online: https://www.radiancevr.co [26.02.2020]

[5] Artivive. Online: https://artivive.com/ [29.02.2020]

[6] Adobe Aero. Online: https://www.adobe.com/de/products/aero.html [30.11.2020]

[7] VRHAM! Virtual Realites & Arts Festival. Online: https://www.vrham.de/ [29.02.2020]; Virtual Worlds Festival. Online: https://virtualworlds-festival.com/ [29.02.2020]

[8] Mixed Realities. Virtuelle und Reale Welten in der Kunst. Exh. 05.05.–26.08.2018. Online: https://kunstmuseum-stuttgart.de/index.php?site=Ausstellungen;Archiv&id=113 [04.01.2021]

[9] E.g. Bjarne Melgaard. Online: https://acuteart.com/bjarne-melgaard-at-julia-stoschek-collection-opening/ [24.02.2020]

[10] unreal.theatre. Online: https://unreal.theater [30.11.2020]

[11] IN VR WE TRUST. Online: https://www.nextmuseum.io/events/daniel-hengst-clemens-schoell-ueber-in-vr-we-trust/ [30.11.2020]

[12] Augmented Reality Biennale 2021 in Düsseldorf (News). Online: https://www.filmstiftung.de/news/augmented-reality-biennale-2021-in-duesseldorf/ [30.11.2020]

[13] AURORA developer André Selmanagić, 04.12.2020, interviewed by Maja Stark.

[14] Introduction into Augmented Reality (undergraduate course at the School for Visual Arts NY). Online: https://bfafinearts.sva.edu/course/introduction-augmented-reality/ [20.02.2020]; advanced Augmented Reality Apps (online course). Online: https://online.colum.edu/course/advanced-augmented-reality-apps/ [29.02.2020]; Augmented Reality (course by Kristin Lucas). Online: https://ima-mfa.hunter.cuny.edu/?ima-course=augmented-reality [29.02.2020]

[15] Postgraduate MA Virtual Reality. Online: https://www.arts.ac.uk/subjects/animation-interactive-film-and-sound/postgraduate/-ma-virtual-reality-lcc#course-summary [30.11.2020]; Master in Design for Virtual Reality. Online: https://iedbarcelona.es/en/cursos-info/master-in-design-for-virtual-reality/?activityId=701w0000001KYG8&gclid=EAIaIQobChMIytGBtKO-q7QIVl4XVCh1AJA_gEAMYASAAEgL45_D_BwE [30.11.2020].

[16] VR in Art: Vortragsreihe zu den Themen Virtual und Augmented Reality und Immersion in der aktuellen Kunst- und Design-

produktion. Online: https://www.hfbk-hamburg.de/de/projekte/vr-art-vortragsreihe-zu-den-themen-virtual-und-augmented-reality-und-immersion-der-aktuellen-kunst-und-designproduktion/ [30.11.2020]

[17] B.A. in Multimedia | VR Design. Online: https://www.burg-halle.de/en/design/multimediavr-design/multimedia-virtual-reality-design/ [30.11.2020]

[18] https://inka.htw-berlin.de/ [04.01.2021]

[19] For more information about the artists, their AR artworks and applications see https://aurora.htw-berlin.de/en/alumni-2/ [04.01.2021]; Busch/Kassung/Sieck 2019 and 2020.

[20] For the detailed program see https://aurora.htw-berlin.de [04.01.2021]

[21] The application can be downloaded for free in the Google Play and Apple App Store.

[22] See aurora.htw-berlin.de/aurora-digital and youtube.com/playlist?list=PLpOdBh7WW3Kaic_-LQSXGiLnvN-wl2Q3e [22.12.2020]

[23] Artist Dagmar Schürrer, 04.12.2020, interviewed by Maja Stark.

[24] 10 questions on the AURORA production laboratory (HTW study with twelve AURORA artists, not published).

[25] For Reiwer's AR roommate see https://aurora.htw-berlin.de/portfolio/theresa-reiwer-en [20.02.2020]

[26] For Wünsche's AR novel see https://aurora.htw-berlin.de/portfolio/juliane-wuensche-en [06.01.2021]

[27] For Kennedy's AR artwork see https://aurora.htw-berlin.de/portfolio/bianca-kennedy-en and KUNST + UNTERRICHT, issue 439/440 (2020), cover and imprint. Online: https://www.friedrich-verlag.de/shop/mixed-reality-51439 [both 06.01.2021]

[28] The values are between 45% (1x) and 120% (1x), most are between 85% and 100%.

[29] Thanks to the artist Dani Ploeger for the exchange on this aspect.

[30] 10 questions on the AURORA production laboratory (study with three AURORA developers, not published).

Literature

Bach, Benjamin/Sicat, Ronell/Beyer, Johanna/Cordeil, Maxime/Pfister, Hanspeter (2017): The hologram in my hand: How effective is interactive exploration of 3d visualizations in immersive tangible augmented reality? In: IEEE transactions on visualization and computer graphics, vol. 24, no. 1, pp. 457–467.

Beckmann, Marie S. (2015): Doug Aitken im Kontext des Extended Cinema. In: Schirn Magazine. Online: https://www.schirn.de/magazin/kontext/doug_aitken_im_kontext_des_expanded_cinema/ [01.12.2020]

Beitin, Andreas/Diederen, Roger (eds.) (2018): Lust der Täuschung – Von der Antike bis zur Virtual Reality. Exh. cat. München/Aachen: Hirmer.

Bozorgzadeh, Amir (2018): The WebXR API opens the door to a new breed of cross-reality games. Online: https://venturebeat.-

com/2018/02/28/the-webxr-api-opens-the-door-to-a-new-breed-of-cross-reality-games/ [26.02.2020].

Busch, Carsten/Kassung, Christian/Sieck, Jürgen (eds.) (2019): Kultur und Informatik – Virtual history and augmented present. Glückstadt: Hülsbusch.

Busch, Carsten/Kassung, Christian/Sieck, Jürgen (eds.) (2020): Kultur und Informatik – Extended Reality. Glückstadt: Hülsbusch.

Hungerford, Margret W. (1878): Molly Bawn. Leipzig: Tauchnitz.

Jung, Yeon Ma/Jong, Soo Choi (2007): The Virtuality and Reality of Augmented Reality. In: Journal of Multimedia, vol. 2, no. 1, p. 37.

Li, Mingyang/Mourikis, Anastasios I. (2013): Optimization-based estimator design for vision-aided inertial navigation. In: Robotics: Science and Systems. Doi: 10.15607/RSS.2012.VIII.031.

Matsuda, Keiichi (2016): Hyper-Reality. Video. Online: https://www.youtube.com/watch?v=YJg02ivYzSs [20.02.2020]

Microsoft Corporation (2019): Introducing instinctual interactions. Online: https://docs.microsoft.com/en-us/windows/mixed-reality/interaction-fundamentals [26.02.2020]

Milgram, Paul/Kishino, Fumio (1994): A Taxonomy of mixed reality visual displays. In: IEICE Transactions on Information Systems, vol. E77/12, pp. 1321–1329.

O'Hear, Steve (2020): Facebook has acquired Scape Technologies, the London-based computer vision startup. Online: https://techcrunch.com/2020/02/08/scapebook/ [26.02.2020]

Park, Jong/Sung, Mee Young/Noh, Sung-Ryul (2005): Virtual object placement in video for augmented reality. In: Pacific-Rim Conference on Multimedia. Proceedings, part 1, pp. 13–24.

Reinhardt, Tilman (2019): Using Global Localization to Improve Navigation. Online: https://ai.googleblog.com/2019/02/using--global-localization-to-improve.html [26.02.2020]

Reiwer, Theresa/Stark, Maja/Thielen, Elisabeth (2019): Theresa Reiwer, TOVIAS. In: Busch/Kassung/Sieck (see above), pp. 127–130.

Schürrer, Dagmar/Stark, Maja/Barsht, Leonid (2019): Dagmar Schürrer, Untitled (Von der Fläche zur Form). In: Busch/Kassung/Sieck (see above), pp. 135–138.

Skwarek, Mark (2018): Augmented Reality Activism in the Present. In: Geroimenko, Vladimir (ed.): Augmented Reality Art. Cham: Springer (2nd ed.), pp. 8–11.

Thiel, Tamiko (2018): Critical Interventions into Canonical Spaces: Augmented Reality at the 2011 Venice and Istanbul Biennials. In: Geroimenko, Vladimir (ed.): Augmented Reality Art. Cham: Springer (2nd ed.), pp. 41–72.

Unity Technologies (2018): Fast Company Names Unity Technologies Among World's Top 10 Most Innovative Companies in Virtual and Augmented Reality. Press release. Online: https://unity.com/our-company/newsroom/fast-company-names-unity-technologies-among-worlds-top-10-most-innovative [26.02.2020]

Weiers, Bradley/Durand, Michael (2018): Multi-platform Handheld AR in 2018. Online: https://blogs.unity3d.com/2018/06/15/-multi-platform-handheld-ar-in-2018-part-1/ [26.02.2020]

Figures

1. Dagmar Schürrer, Untitled (Von der Fläche zur Form), 2019, augmented sculpture, 40 x 25 x 20 cm. Photo: © the artist.
2. Dagmar Schürrer, Virtualized, 2020, AR video installation, two monitors, 10:55 min. Photo: © the artist.
3. Theresa Reiwer, TOVIAS, part of AR room installation, 2018/19. Photo: © the artist.
4. Artists and AURORA team members interact with Bianca Kennedy's AR drawing *Swimming with the Lovers* (2018/19) during a Retune Studio Visit at HTW Berlin. Photo: © Nushin I. Yazdani | Retune.

The Internet Does Not Exist

Von Julieta Aranda

Während die Netzkunst zu Beginn der 1990er Jahre mit dem Internet noch eine Hoffnung auf umfassende Demokratisierungsprozesse verband, sieht sich die Kunst gegenwärtig mit einem in fast allen Bereichen kommerziell gewordenen Netz konfrontiert. Zwar haben sich neue kollaborative Formen der Wissensproduktion, Räume des Austauschs in vielzähligen Online-Communitys und Möglichkeiten pluraler Identitätsentwürfe eröffnet, jedoch sind diese in weiten Teilen durch wirtschaftliche Interessen, Aufmerksamkeitsökonomien, Überwachung und affektgeladene Diskussionen überformt. Insofern sind Post-Internet-Künstler*innen durch ein anderes Internet sozialisiert als noch die Netzkünstler*innen. Der Präfix „Post" verweist nicht nur auf die nachrevolutionäre Allgegenwart des Internets, sondern auch auf dessen strukturelle Bedeutung für die Kunst heute: In Zeiten von Aufmerksamkeitsknappheit angesichts der steigenden Informationsdichte sind beispielsweise massenmediale Verwertungs- und Verbreitungslogiken mehr denn je nicht zu vernachlässigende Elemente künstlerischer Produktion und Rezeption. Seit Andy Warhol und Jeff Koons ist dies zwar kein unbekanntes Phänomen; in der Post-Internet Art werden derzeit jedoch neue Formen etabliert – Markenökologien in ganz neuer Qualität ausgedehnt, Start-Ups gegründet, Künstler*innen als Unternehmer*innen professionalisiert und alternative Plattformen institutionalisiert. Vor dem Hintergrund struktureller Bedingungen der aktuellen Kunstproduktion scheint dies nur konsequent: In Street-Art-Kampagnen von Sportartikelherstellern, gesponserten Essays in Kunstmagazinen oder Stadtmarketing im Namen florierender Kunstszenen haben sich Formen von Guerilla--Taktik, Product Placement und Criticality als wertsteigende Performance verflüssigt. Der Glaube an die Wirkmacht tradierter Formen künstlerischer Kritik ist längst in Managementdiskursen und der Werbeindustrie aufgegangen. Stattdessen bilden die eigenen techno-ökonomischen Verwicklungen für Post-Internet-Künstler*innen das Milieu für ihre Arbeit.

Branding ist eine Strategie, in der sich zentrale Aspekte dieser komplexen Prozesse bündeln: „Für die Kunst ist Branding interessant, weil es veranschaulicht, wie in einer Aufmerksamkeitskonomie kollektive Identitäten und Öffentlichkeit durch Images erzeugt werden, durch Bilder, die Produkte oder Erfahrungen repräsentieren" (Joselit 2016). An Branding zeigt sich, wie Aufmerksamkeit aktiviert, konzentriert und verstetigt wird. Und in Marken verdichten sich – wie in Kunstwerken – Erfahrungen, Fiktionen, Wünsche und unterschiedliche künstlerische Auseinandersetzungen.

Brand/ing aus markenökologischer Perspektive

Eine Marke zeichnet sich durch einen unverwechselbaren Namen, visuelle Marker wie Logos, ein prägnantes Design und durch ihre symbolische Aufladung aus. Die Identifikation mit bestimmten Marken soll es Kund*innen erleichtern, ein Produkt oder eine

Dienstleistung von anderen zu unterscheiden (vgl. Ghodeswar 2008: 4). Marketing bzw. Branding ist darauf ausgerichtet, sich in die Köpfe der Kund*innen zu manövrieren (wörtlich und etwas unangenehmer: zu brennen) und möglichst langanhaltende Bindungen zu erzeugen (ebd.). Dabei werden viele „Dimensionen des Brandings im Endprodukt nicht mehr erkennbar […] von der Marktforschung bis zur Untersuchung von Mustern in Verbraucherdaten" (Joselit 2016). David Joselit fordert daher, Branding im Kontext aktueller Kunst auf tieferliegende Strukturen fernab mimetischer Reproduktionen von Werbeästhetik zu untersuchen, sich also nicht nur den rhetorischen Oberflächen zu widmen, sondern komplexen Erzeugungs- und Verbreitungsstrukturen von Marken. Anders formuliert: ihren medialen Ökologien und Strukturierungen. Kaum ein Wissenschaftsgebiet scheint gegenwärtig ohne ökologische Reformulierung auszukommen (vgl. Hörl 2016). Dabei lässt sich gegenüber der ursprünglichen Bedeutung von Ökologie als Gesamthaushalt der Natur eine Sinnverschiebung konstatieren: „Der Begriff wird darin zunehmend denaturalisiert und es ist zu beobachten, dass er seine politisch-semantische Aufladung mit Natur verliert, er drängt förmlich zur Losung einer ‚Ökologie ohne Natur'" (ebd.: 33). Damit verblassen gleichzeitig mit ihm assoziierte, nicht unproblematische „Dogmatismen der Nähe, des Unmittelbaren, des Vertrauten, des Verwandten, des Gesunden, des Heilen, des Unversehrten, des Eigenen, des Hauses, kurzum seine Verbundenheit mit den Dogmatismen der Eigentlichkeit" (ebd.). In solchen semantischen Verschiebungen bildet sich, so Hörl, „die jeweils tragende technisch-mediale Kondition" (vgl. ebd.: 47) ab. In der Medienökologie kommt etwa die konzeptionelle Auflösung der Dichotomie von Natur und Technik zum Ausdruck. Dabei meint Ökologie vermehrt „das Zusammenwirken einer Vielfalt humaner und nicht humaner Akteure und Kräfte" (ebd.: 35).[1] Medien – und probehalber hier auch Marken – werden im ökologischen Sinne dann als „Netzwerke technologischer Verbindungen" und als „Infrastrukturierungen von Handlungen menschlicher, aber auch nicht menschlicher Akteure" (Rothe 2016: 46) beschrieben. – Diese theoretischen Bezüge lassen sich als interpretative Rahmen auch in aktuellen künstlerischen Strategien finden.

Katja Novitskova, Verfasserin des *Post-Internet Survival Guide*, beschreibt Marken etwa als agentielle Entitäten: „Brands are real, singular entities with their own histories and capacities. Although extensions of ourselves, they have material bodies, they impact our imaginations and emotions. Commerce has become a huge ecological and geological force, and today the Internet is where it is culturally liquefied in images, in social and financial transactions" (Novitskova 2013). Marken sind für die Künstlerin zu einem gewissen Grad unkontrollierbare Kräfte, mit denen wir es zu tun haben.[2] Sie prägen maßgeblich unseren Alltag, wir bekommen sie jedoch nicht vollends zu fassen. Unter dieser Prämisse geht es Novitskova nicht um die Dekonstruktion semiotischer Zusammenhänge von Marken. Stattdessen werden Brandingstrategien in deren affirmativen Verstärkung thematisch: „we render and participate in the life cycles of brands; instead of diagnosing a perversion in our relationship with brands, we expand brand ecologies, their aesthetic and actual impact" (ebd.). Entscheidend wird es für Künstler wie Alex Israel dort, wo uns die Dinge trotz aller Aufgeklärtheit einnehmen: „Wir wissen, dass Reality-TV Fake ist, dass Kim Kardashian in fast jedem Bild gephotoshoppt ist […]. Es ist nicht meine Aufgabe, auf diese Industrien mit dem Finger zu zeigen, aufzudecken, wie sie uns manipulieren, sie zu kritisieren oder gegen sie anzukämpfen. Ich finde es interessant, wie wir uns gegen alle bessere Einsicht immer weiter unterhalten lassen, unsere Skepsis ausschalten, followen, taggen, posten, pingen, kommentieren usw. Was fesselt unsere Aufmerksamkeit so sehr?" (Israel 2016). Handlungsmacht wird angesichts unkontrollierbarer Umwelten im Umgang mit aktueller Mainstreamkultur verortet.

In Transition: Über Aggregatzustandsänderungen

Der Umgang mit den Zeichensystemen markt- und markenförmiger Alltagskultur zeigt sich am Beispiel des Künstler*innenkollektivs *DIS* auf struktureller Ebene: Das ursprüngliche Konzept einer *DISruptive innovation*[3] beständig erweiternd, versammelt das Kollektiv unter seinem Label zahlreiche Ausstellungen, Publikationen, Mode, Slogans, Performances, Diskussionen und kreative Netzwerke. *DIS* bildet einen Markenorganismus, der seine Formen und Formate ständig ändert: Mit *DISown* kuratierte das Kollektiv beispielsweise eine Ausstellung im New Yorker *Red Bull Arts Space*. Diese wurde später zu einem Online-Shop für von Künstler*innen gestaltete Gebrauchsgegenstände und Kleidung. Die Objekte fungieren gleichzeitig aber als Statement Pieces und tragbare Gegenwartskommentare: So wird ein Sportanzug von einem Kunststudenten – mit einer Nike-Mütze auf dem Kopf – mit Adidas-Streifen versehen und als „the latest in brand worship on a budget: hand-painted streetwear" beworben. Als vermeintlicher Echtheitsbeweis dient ein Foto, auf dem die Streifen gerade aufgetragen und Produktionsbedingungen scheinbar

offen gelegt werden (Abb. 1).

Das Model im Trainingsanzug sieht dabei abwesend in die Leere, seinem Job gegenüber offenbar indifferent. – Stereotype Selbstbeschreibungen einer wachsenden prekär-kreativen Klasse, die in diesem Beispiel aufscheinen, werden bei *DIS* genauso als massenproduzierte Ready Mades gehandelt wie das Substrat der Marke Adidas, das hier appliziert wird. Während die kulturellen Codes und ironischen Gesten der Künstler*innen mitunter voraussetzungsreich sind, sollen die geschaffenen Bilder und Produkte wiederum zirkulieren, im Netz genauso wie im physischen Raum, sich explizit in kunstferne Kontexte transportieren und dort aktuelle Themen sicht- und (an)greifbar machen. Bedeutungsproduktion nach der Alltäglichwerdung des Internets heißt in diesem Fall, die Kommunikationsmittel und Wertschöpfungsmechanismen des Internets zu nutzen, sich der Presets einer kommerziell durchformten Welt zu bedienen, diese neu zu kombinieren und in unterschiedlicher Form zu übersetzen – vom Objekt in der gesponserten Ausstellung zu Bild und Ware auf der eigenen Website zum Gebrauchs- und Diskussionsgegenstand auf der nächsten Party.

Diese Transformationen stehen beispielhaft für Aggregatzustandsänderungen, die Post-Internet Art kennzeichnen. Der White Cube bildet nur eine Haltestelle innerhalb eines größeren Rahmenwerks. Es lassen sich darüber hinaus, wie hier in markenökologischer Perspektive nur angedeutet werden konnte, je nach Kontext und Zielgruppe Verflüssigungen von Kunst in strukturelle Momente und mediale Infrastrukturen beobachten (vgl. auch Vierkant 2010). In ihren zahlreichen Format(ion)en befördert Post-Internet Art Prozesse, die Christopher Kulendran Thomas als „instituting reality“ beschreibt: „The crucial point here is that art has always produced its reality *structurally* and not just through its viewers interpretation” (Thomas 2013). Dabei unterscheidet sich Post-Internet Art, wie am Beispiel des Brandings skizziert, in ihrer Haltung von Vorgänger*innen wie der Pop Art: Sie kümmert sich kaum noch darum, welche imaginierten oder zugeschriebenen Grenzen zu sprengen wären, zwischen Kunst und Kommerz, High and Low Culture, On- oder Offline. Es geht auch nicht um die Heraushebung alltäglicher Gesten als besondere, sondern um das Schwimmen im Mainstream, der durch eigene Aktivitäten und Schaffung eigener Infrastrukturen navigiert wird. Etwa, wenn *DIS* sich unter *dis.art* unlängst als *streaming platform* neudefiniert und gemeinsam mit Künstler*innen und Wissenschaftler*innen verschiedenster Disziplinen über eine zeitgemäße Form der Bildung nachdenkt. Spätestens hier kann die Kunstpädagogik dann hellhörig werden.

Anmerkungen

[1]Daraus folgt, was hier nicht weiter ausgeführt werden kann: Die Erschütterung anthropozentrischer Einbildungen.

[2]Bei Novitskova finden sich durchaus reduktionistisch-evolutionsbiologisch geführte Argumentationen in Bezug auf -Markenökologien, denen mit Skepsis zu begegnen ist (vgl. Franke/Pinto 2016).

[3]Vgl. https://en.wikipedia.org/wiki/Disruptive_innovation [1.2.2018]

Literatur

Cornell, Lauren im Interview mit Katja Novitksova (2013): Techno-animism. In: Mousse Magazine. Band 36, Ausgabe 2. Online: http://moussemagazine.it/lauren-cornell-techno-ani-mism-2013/ [23.2.2018]

Franke, Anselm; Teixeira Pinto, Ana (2016): Post-Political, Post-Critical, Post-Internet
Why Can’t Leftists Be More Like Fascists? In: open! Platform for Art, Culture & the Public Domain. Online: http://www.onlineopen.org/post-political-post-critical-post-internet [1.2.2018]

Ghodeswar, Bhimrao M. (2008): Building brand identity in competitive markets: a conceptual model. In: Journal of Product & Brand Management. Band 17, Ausgabe 1, S. 4-12.

Hörl, Erich (2016): Die Ökologisierung des Denkens. In: Zeitschrift für Medienwissenschaft. Band 14, Heft 1, S. 33-46.

Israel, Alex im Gespräch mit Texte zur Kunst (2016): Ich bin kein Punk. In: Texte zur Kunst. Heft 104. Online: https://www.tex- tezurkunst.de/104/ich-bin-kein-punk/ [23.2.2018]

Joselit, David (2016): Four Theses on Branding. David Joselit on Berlin Biennale 9. In: Texte zur Kunst.Heft103.Online:http- s://www.textezurkunst.de/103/four-theses-branding/[2.2.2018]

Rothe, Katja (2016): Medienökologie – Zu einer Ethik des Mediengebrauchs. In: Zeitschrift für Medienwissenschaft. Band 14, Heft 1, S. 46-57.

Thomas, Christopher Kulendran (2013): Art and Commerce. Ecology Beyond Spectatorship. In: Dis Magazine. Online: http://dismagazine.com/discussion/59883/art-commerce-ecolo- gy-beyond-spectatorship/ [1.2.2018]

Vierkant, Artie (2010): The Image Object Post-Internet. In: JstChillin.
Online: http://jstchillin.org/artie/pdf/The_Image_Object_Post-Internet_a4.pdf [5.3.2018]

Zahn, Manuel (2017): Resonanz. Medienökologische Perspektiven der Kunstpädagogik. In: Pierangelo Maset, Kerstin Hallmann (Hg.): Formate der Kunstvermittlung. Kompetenz – Performanz – Resonanz. Bielefeld, S. 93-105.

Abbildung

Abb. 1: DIS: Art School Track Suit: Online: https://disown.dismagazine.com/collections/ap