The Myth of Emancipation through Interaction

On the Relationship between Interactive Dimensions and Emancipating Potentials of Contemporary (Digital) Art

Lotte Philipsen

ABSTRACT The purpose of this article is to critically address a widespread assumption that reads like this: Works of art that make use of digital media automatically, through interactivity, are generally better suited for generating democratic processes in society than other art forms or phenomena that do not make use of digital media, and, therefore, digital art is more avant-garde than other art forms. By analysing the chains of equivalence underlying this assumption the article presents and discusses a number of issues that, taken together, render this assumption fallacious.
KEYWORDS Digital art, avantgarde, politics

It is often claimed that in digital art commands, formula and process have replaced contemplations, objects and completions, and that inter-activity holds a key position in digital art. Thus it is with specific reference to interactivity that a link between digital art and avant-garde is explicitly promoted by among others Peter Weibel and Lars Qvortrup. Both argue that the computer medium, because of its interactivity, plays a leading role in interactive contemporary art that focuses on process rather than art object, and hence transforms the viewer to a user who actively participates in the work. As Weibel puts it:

> Contemporary avant-garde artists respond sensitively to social changes by changing the structure of their approach to their work and entering into new alliances with new forms of enactment [...] The technical arts, the computing arts, play the pivotal role here [...] As instruction for action qua artwork, art finally becomes a civil democratic medium.[1]

According to Weibel, the computing arts play such a pivotal role because they are emancipating as well as democratic, and he compares the situation today with that of the Enlightenment, which he presents like this:

> The lower classes have less the arts to thank for their emancipation and more the natural sciences and the spirit of the Enlightenment, which set out to free humans from the social power exercised by the shackles of disenfranchisement forged by the aristocracy and the church and from the power of nature [...] We are in a similar position today. The intention is to extend and advance

the spheres of democracy, by again allying them with the natural sciences through the agency of the mechanical and digital media arts, and in this way, with the help of the artificial appliances provided by new technologies and procedures, to create platforms and practices for democratic processes.[2]

But why should mechanical and digital media art be better suited for generating emancipatory and democratic processes than, for instance, books or paintings? The reason is the widespread idea that digital art is automatically more *interactive* than non-digital art – an idea that is presented among others by Christiane Paul and by Lars Qvortrup who, like Weibel, compare digital art to the avant-garde movements from the beginning of the 20th century.

Though Qvortrup acknowledges that the computer cannot realise the avant-garde goal of subverting existing social power structures, he nevertheless argues that the computer is a medium that 'corresponds to the dreams of the avant-garde, because the computer is interactive. [Whereas] a poem is not well suited for hitting people in the head [...] digital art is different from analogue art. The digital medium renders it possible to create a fictional world that the user can enter and act in'.[3]

Likewise Christiane Paul states that:

'The digital medium's distinguishing features certainly constitute a distinct form of aesthetics: it is interactive, participatory, dynamic, and customizable, to name just a few of its key characteristics. [...] While the user's or participant's involvement with a work has been explored in performance art, happenings, and video art, we are now confronted with complex possibilities of remote and immediate intervention that are unique to the digital medium.[4]

So the assumption presented by, among others, Weibel, Paul and Qvortrup looks roughly like this: 'Digital art is avant-garde because it makes use of digital media/technologies, which automatically prompt interactive, participatory art, which on its part automatically prompts a participatory democratic society.' But the logic behind this assumption is fallacious for a number of reasons, of which the following will account for six points of criticism, which can be roughly formulated like this:

- Formalistic avant-garde is not identical to social avant-garde.
- The concepts of 'technology', 'medium', and 'art' should not be confused.
- 'Interactive art' is not automatically collaborative.
- Interaction/participation is not automatically democratic.
- Nor are (electronic) social media automatically democratic.

- And finally: Interaction/participation is not automatically emancipating.

Some of the above points seem to be almost similar (for instance point 4, 5, and 6), but as the following analyses will demonstrate, terminological differences are of significance since terminological confusions are the results of, or tend to cause, erroneous assumptions like the one this article is addressing.

I

First of all, it is a conspicuous fact that formalistic avant-garde is not identical to social avant-garde. To understand the avant-garde dimension of digital art it is beneficial to look into the definition of digital art, since the problems start to some extent at the attempts to coin such a definition. Since digital computer technology is everywhere today, it takes more for a work to be termed 'digital art', than the artist having utilized any kind of digital computer technology in the process of creating the work – that would include for instance digital photography, which is *today* not commonly considered digital art. Consequently, Christiane Paul, in her book *Digital Art*, distinguishes between the use of digital computer technology in art as a *tool* and as a *medium*. Whereas digital computer technology as a tool covers digital photography among other things, 'the employment of digital technologies as an artistic medium implies that the work exclusively uses the digital platform from production to presentation, *and* that it exhibits and explores that platform's inherent possibilities'.[5]

Thus, unlike works that accidentally make use of digital computer technology at some stage(s) from production to presentation, so-called digital art, according to Paul's logic, extensively operates by use of digital computer technology in the whole spectrum from production to presentation *and*, at the same time, displays an engagement in digital computer technology in its contents. This double-coined definition of digital art is supported by other practitioners and theorists in the field, like Mark Tribe, who defines digital art as 'work that both makes use of digital technologies *and* is concerned with their cultural, political, and aesthetic significance',[6] and Søren Pold, who describes net art (but also implicitly digital art) as 'an art form that in its form *as well as* in its content thematises digitalization'.[7]

According to this way of defining 'digital art', what separates it from 'art' in general is, thus, a matter of material form *as well as* thematic content. This double definition seems to unite two opposed avant-garde theories of the twentieth century in an odd manner – that is on the one

hand a formalistic avant-garde theory which insists on the pure medium (represented by Clement Greenberg among others), and on the other a theory focused on art's ideological and political potentials in society in general (represented by Peter Bürger among others).

The demand that digital art must make use of digital computer technology follows the line of Greenberg's credo that 'It is by virtue of its medium that each art is unique and strictly itself. To restore the identity of an art the opacity of its medium must be emphasized'.[8] The additional request, however, that digital art must address the socio-cultural relevance of digital computer technology, is in accordance with Bürger's analysis of the aim of the historic avant-gardes 'to reintegrate art into the praxis of life'.[9]

Neither Greenberg nor Bürger, however, is referred to when scholars consider digital art to be avant-garde. The idea that digital art possesses particular avant-garde characteristics has been promoted by a number of theorists in the field who all link digital art to the cybernetic neo-avant-garde of the 1960s in the sense that digital art (or computer art) stems directly from the 1960s' experiments with and focus on systems and process rather than the work of art as a final result.[10] In other words: the computational character of works by Sol Lewitt, John Cage and mail artists among others, is seen as foregrounding digital art today, which is then termed 'avant-garde'. If the term avant-garde is understood literally as a vanguard, leading the way into new territory, then the digital avant-garde is not in any way a new *social* territory, attempting to subvert existing power structures, since these have already embraced cybernetic thinking at that time.[11] Consequently Hans Magnus Enzensberger in 1970 termed this line of artistic experiment an 'apolitical avant-garde', which 'has found its ventriloquist and prophet in Marshall McLuhan, an author who admittedly lacks any analytical categories for the understanding of social processes'.[12]

II

It seems unnecessary to point out the fact that 'technology', 'medium', and 'art' are not identical concepts. Nevertheless a sliding between digital 'art' and digital 'technology', and between digital 'art' and digital 'medium' is present in the above quotes by Weibel, Qvortrup and Paul. Though design-projects often move across traditional institutional boundaries, the concepts of 'technology', 'medium' and 'art' should not be confused, as they work on different levels, which media theorist Lars Elleström has lucidly argued. Elleström's ideas are helpful when differing between the different roles which digital technology can play in works of art, since he distinguishes between materiality and perception, which is where the slidings in

the above quotes seem to happen. Elleström distinguishes between basic media, qualified media, and technical media in the following manner:

Basic media are the concrete media impressions that we encounter through *perception*. Thus, in the case of a painting it consists on a level of basic media 'of paint on a two-dimensional (or weakly three-dimensional) surface that can be seen (and to a lesser degree felt and smelled). Generally, the iconic signs dominate. The iconic signs, together with conventions for representation, very often make us perceive virtual space in the depiction'.[13]

Qualified media, on the other hand, result from historical, social and cultural habitudes that, in the example of the painting, means that

> In order to be counted as a painting instead of only paint spread around, how-ever, the picture must be produced and presented within generally accepted social and artistic frames and it should have some aesthetic qualities. None of these qualifying aspects are truly stable, though. Like all art forms and other qualified media, the nature of 'painting' can only be circumscribed ad hoc.[14]

Any *accepted art form* can therefore be considered a qualified medium even though it consists of basis medial modalities. This definition of qualified medium is in accordance with the widely accepted institutional theory of art, according to which art is defined by institutional affiliation.[15] Put otherwise: If it is accepted as art by the professional art institutional framework, then it is art.

Technical medium is what *concretely realises* basic and qualified media, in so far as without technical media the basic media and qualified media are nothing but abstract concepts. Canvas and paint are technical media that render possible painting as basic medium and (fine art) 'painting' as qualified medium.

It does not make sense to definitively classify certain media as basic, qualified or technical, since media can mediate and represent each other. Instead, we should consider basic, qualified, and technical media as different media roles. For instance:

> Seeing a *representation* of a book on the screen has very little in common with interacting with a real book since the technical medium book is not mediated. However, the basic media that a book can *mediate* – certain visual texts and still images – can also be *mediated* very well by the television screen. [...] To put it more straightforwardly, the technical medium 'television set' *mediates* the qualified medium 'television program' that *represents* the technical medium 'book' that *mediates* the basic medium (visual, verbal, static) 'text'.[16]

Elleström's distinctions allow us to recognize the different levels on which

'the digital' can occur in art, and – most importantly – to distinguish between them, in order to use the terms more precisely than is often the case.

Part of the reason that such slidings are often at work in writings on digital art may be that this field is rather heterogeneous in the sense that practical and theoretical discourses are deeply intertwined. The primary platform for showing and discussing digital art is the festival, which combines exhibitions, concerts, conferences, performances, club nights etc. in a period of a few days, and many actors in the field carry multiple identities as artists/engineers/theorists/computer scientist etc. This creates fruitful cross-disciplinary collaborations that are able to transgress traditional demarcation lines between art forms and between practice and theory. But it also means that finding a common vocabulary is neither easy nor, perhaps, important.

If, however, we want to discuss how, or whether, digital art differs from contemporary art in general, terminological precision is needed. So whereas it makes sense that artistic practices of digital art should develop new *creative* cross-fertilisations, then academic writings on digital art should aim to describe, analyse and discuss such artistic practices in a manner that actually makes the field accessible to a broader audience of academia, who are not necessarily familiar with or subscribe to the (unspoken) assumptions of the academic 'insiders' of digital art. Clarifying the concepts of this field and their connections and intertwinements allows approaches from different academic disciplines to contribute to discussions on digital art, and hence potentially further *academic* cross-fertilisations similar to the artistic ones in the field.

III

A third count that opposes the fallacious assumption that digital media = interaction = democracy = avant-garde is that 'interactive art' is not automatically collaborative. Under the heading 'The Myth of Interactivity', which has inspired the title of this article, new media theorist Lev Manovich argues that 'In relation to computer-based media, the concept of interactivity is a tautology' since '[o]nce an object is represented in a computer it automatically becomes interactive'.[17] Hence, the notion of interactivity should be qualified. Professor of systematic musicology Uwe Seifert defines interaction like this: 'The concept of "interaction" is based on the definition of "to act upon": Two different things interact if and only if each acts upon the other'.[18] The two different things that interact in so-called digital art may be either machines or humans or interaction between machine and human.

Often, works of art that are presented and discussed as 'interactive' are

in reality re-active – meaning that the work reacts in a pre-described manner, which is the case when you click a link and a new webpage opens[19] – or they are participatory – meaning that the work relies on user input in order to exist or be 'complete'[20], or their interactivity is solely systematic – meaning that computors or robotic devices interact with each other.[21] Thus, a term like 'interaction' (or collaboration) are often applied in situations or works of art that incorporate merely 'action'. From this follows that for a work of art to be collaborative it must allow people/audience/users to interact *with each other* and not just individually with a computer.

However, interactive works in the field of digital art very rarely allow for collaboration. At Ars Electronica, which is the oldest and most prestigious festival for digital art, held annually in Linz in Austria, prizes are rewarded to works of art in different categories, one of which is the category of 'Interactive art'. A closer look into the winners in the 'Interactive art' category during the last 12 years curiously reveals that only one work ("Can you see me now?") qualifies as collaboratively interactive in the sense that two humans act upon each other.

ARS ELECTRONIC WINNERS IN THE 'INTERACTIVE ART' CATEGORY, 2001–2012

Year	Winning work	Interactive dimensions
2001	"Polar"(Carsten Nicolai, Marko Peljhan)	Audience can enter the room, which changes light and sound output according to audience input.
2002	"N-cha(n)t" (David Rokeby)	Computers interacting with computers, receptive to audience input.
2003	"Can you see me now?" (Blast Theory, Mixed Reality Lab)	Online players and runners in the street, participating in a 'chase and catch' game. Interaction between 'artists' and players.
2004	"Listening Post"(Ben Rubin, Mark H. Hansen)	Installation collecting and manipulating input from users of the Internet. The audience witness the installation's output.
2005	"MILKproject" (Ieva Auzina, Esther Polak, RIXC – Riga Center for New Media Culture)	GPS-tracking of milk. Audience can follow the route of the milk.

2006	"The Messenger" (Paul DeMarinis)	Receives input in the form of e-mails and generates an output.
2007	"Park View Hotel" (Ashok Sukumaran)	The work is re-active – responses to audience triggering a point-and-shoot device.
2008	"Image Fulgurator" (Julius von Bismarck)	A device that alters photographs taken by random by-passers.
2009	"Nemo Observatorium" (Lawrence Malstaf)	One member of the audience can enter a cabin, where small pieces of Styrofoam are blown in a tornado-like formation.
2010	"The EyeWriter" (Zach Lieberman, James Powderly, Tony Quan, Evan Roth, Chris Sugrue, and Theo Watson)	Enables a person (through robotic devices) to make graffiti on walls in urban space by using eye movements only.
2011	"Newstweek" (Julian Oliver, Danja Vasiliev)	Hacks and modifies electronic news accessed in specific locations. Readers of the fake news are unaware of the live human-computer interaction that takes place behind the scene.
2012	"Memopol-2" (Timo Toots)	Collects and visualizes information on a person by reading that person's ID-card.

At this stage it is important to stress that the lack of collaborative interaction does not in any way render the works of poorer artistic quality. The aim of this article is not to judge the artistic quality of specific works that make use of digital computer technology, but solely to present a critical analysis of a widespread fallacious assumption.

IV

Just like interaction or participation is not automatically collaborative, nor are they assuredly democratic. Curator and art theorist Nicolas Bourriaud has promoted relations and human interactions as the essence of contemporary art.[22] According to Bourriaud, the ability of works of art to create social interstices and micro-utopias in society has a political func-

tion insofar as it implicitly liberates us from an (old-fashioned) prison of individual subjectivity by suggesting (new) inter-subjective communities. But the idea that art that stages inter-human interactions and relations has a positive political impact on society in general has been countered by other critics of contemporary art. Thus, art critic Hal Foster states that: 'Sometimes politics are ascribed to such art on the basis of a shaky analogy between an open work and an inclusive society, as if a desultory form might evoke a democratic community, or a non-hierarchical installation predict an egalitarian world.'[23]

The reason that open, participatory works cannot automatically be favoured to non-participatory works when attempting to create 'political' or 'democratic' art, is that – as Claire Bishop has lucidly argued in her critique of Bourriaud's idea of 'Relational Aesthetics' – democracy is characterized by conflictual relations; not by interactivity and participation as such. Bishop paraphrases Bourriaud's idea that:

> 'The interactivity of relational art is [...] superior to optical contemplation of an object, which is assumed to be passive and disengaged, because the work of art is "social form" capable of producing positive, human relations. As a consequence, the work is *automatically* political in implication and emancipatory in effect'.[24] (Bishop (paraphrasing Bourriaud), p. 62, emphasis added.)

Thus, according to this line of thought, which is often demonstrated in presentations of art that make use of digital technology, activating the audience is considered in itself to facilitate democratic processes regardless of whether participation is characterized by mutual agreement or dissensus. In order for democratic processes to be at work, however, antagonism and conflict are required. As Bishops puts it, with reference to Ernesto Laclau and Chantal Mouffe's work on political philosophy: 'a democratic society is one in which relations of conflict are *sustained*, not erased. Without antagonism there is only the imposed consensus of authoritarian order – a total suppression of debate and discussion, which is inimical to democracy.'[25]

The point is that, while some interactive works of art display democratic conflict and other works promote un-problematic co-existence, there is no automatic logic linking interactivity or participation in general with radical democracy.

V

If interaction and participation in general cannot in itself assure democratic processes, perhaps (electronic) social media have a better chance?

The answer is 'no'; social media are not automatically democratic. Obviously, social media like Facebook and Twitter have proved their democratic and even revolutionary potentials in the Middle East during the winter and spring of 2011. But the same social media are also to a great extent employed for personal updates that qualify as communication – often one-way communication – like 'My cat just got kittens!' or 'I don't like the dress that the minority leader wore in the debate on TV last night'.

Activist and media theorist Franco Berardi has pointed out how the 'techno-informational universe' has destroyed the 'inter-human sensory film' and led to a generation that is capable of interacting only though unequivocal and predetermined modes of connection, but who is insensitive to conjunctions of slow, irregular or analogue modes.[26] Thus rather than promoting democratic processes, Berardi sees digital technology as possessing the danger of being a biopolitical nightmare that controls our ability to engage in relations and issues that are not written into the behavioural code of the digital information society. According to Berardi, therefore, it is of great importance to be aware of the way digital culture shapes the function of our mind, and to attempt to interfere in this influence by alternative use of digital technology.

A somewhat similar point of view was presented in 1970 by Hans Magnus Enzensberger, who paid attention to the two-edged ability of new technology when he argues that 'wage-earners' already owned tape-recorders and cameras, but they failed to apply these new technologies of media production in places where social conflict existed – that was in schools, workplaces and in the offices of the bureaucracy. Instead, new technologies were used solely for leisure purposes.[27] Thus, to Enzensberger the problem was not a lack of media production facilities in itself – the problem was that these facilities were not applied properly, as in social struggles, by the left wing. Consequently, Enzensberger distinguished between 'repressive use of media' and 'emancipatory use of media':

Repressive use of media	Emancipatory use of media
Centrally controlled programme	Decentralized programme
One transmitter, many receivers	Each receiver a potential transmitter
Immobilization of isolated individuals	Mobilization of the masses
Passive consumer behaviour	Interaction of those involved, feedback
Depoliticization	A political learning process
Production by specialists	Collective production
Control by property owners or bureaucracy	Social control by self-organization[28]

Two points in Enzensberger's work are of relevance here: First, that new media technologies in themselves are neither repressive nor emancipatory – it all depends on how and in what context they are put to use. And second, that, once again, passiveness is aligned with de-politicization – and, one may add, alienation – whereas interactivity is aligned with participatory democracy. The latter point, however, is strongly contested by the following, and final, issue in this article's overall analysis.

VI

Using philosopher Jacques Rancière as a main point of reference, this section demonstrates why interaction or participation does not necessarily have emancipating potentials. Rancière describes the relationship between emancipation and interactivity in his text "The Emancipated Spectator". According to Rancière, artists or directors (as he writes mostly about theatre in the text) often operate with a dichotomy, like the one presented by Enzensberger, which turns out to be false. According to Rancière, the problem with such dichotomies is that they operate with a superior all-knowing, intelligent subject position of the 'active'-side, who is capable of emancipating the inferior, less intelligent passive-side through interaction. But rather than thinking of the difference between passive spectator and active participant as a true hierarchy of intelligences, we should, according to Rancière, consider this difference to be merely one way of distributing the sensible, which may well be contested by other ways. This means that the value-laden judgements connected to each side of the dichotomy are not real, but are subject to (ideological) change.

The aim, however, is not to make a 180 degrees turn that favours passivity over (inter)activity, but to release the chains of equivalence creating the dichotomy and, instead, insist on a sense of equality between different ways of relating to the world. As Rancière himself puts it:

> [Emancipation] begins when we dismiss the opposition between looking and acting and understand that the distribution of the visible itself is part of the configuration of domination and subjection. [...] the principle of emancipation is the dissociation of cause and effect.[29]

> Spectatorship is not a passivity that must be turned into activity. It is our normal situation. We learn and teach, we act and know, as spectators who link what they see with what they have seen and told, done and dreamed. There is no privileged medium, just as there is no privileged starting point.[30]

Artist David Rokeby, who was himself rewarded the Ars Electronica Prize

in the 'Interactive art' category in 2002, implicitly supports Rancière's point in his statement that interactivity may actually work to fragment the user's subjectivity rather than supporting it, because in art interactivity and participation is initiated and staged by the artist and not by the users themselves. According to Rokeby, what happens could be that: 'We trade subjectivity for participation and the illusion of control; our control may appear absolute, but the domain of that control is externally defined.'[31] In fact, the illusion of control, and perhaps even of political engagement, compensate for the fact that we have in reality lost that control.[32]

Conclusion

This article started out by accounting for the assumption that 'Digital art is avant-garde because it makes use of digital media/technologies, which automatically prompt interactive, participatory art, which on its part automatically prompts participatory democratic society'. Hopefully, the article has demonstrated why this assumption can be considered a myth rather than a truthful fact. Since the above analysis has been informed primarily by discourse theory in its attempt to contest a hegemonic assumption by shedding light on its underlying chains of equivalence, it leaves us with the question of what potentials art that makes use of digital technology actually possess.

One characteristic feature of digital technology that transfers into the realm of many works is its ability to challenge traditional borders between qualified media. For instance, experiencing a work like *Listening Post,* from the above list of 'Interactive art' winners at Ars Electronica (2004), can be said to somehow incorporate reminiscences from or merge qualified media such as visual art, cinema, performance, and music without being just one of them. Consequently, it fits the festival format of Ars Electronica perfectly, but even though *Listening Post* has, to a limited degree, been included by the institutions of traditional qualified media (it has been exhibited at art museums), it is now permanently installed at the Science Museum in London. Thus, many works (but not all) that make use of digital technology do so in a manner similar to the development in popular media, which Henry Jenkins has termed 'Convergence culture', meaning that 'old and new media will interact in ever more complex ways' as opposed to 'the digital revolution paradigm [which] presumed that new media would replace the old'.[33] A work like *Listening Post* perfectly exemplifies a complex *artistic* convergence of interactivity (computer to computer and human to human in the chat room conversations, which the work taps into) and contemplation (the work's audience

is passive), as well as digital (technical medium) and analogue (basic medium). The discursive *theoretical* framings of works like *Listening Post*, however, tend to create from such convergences chains of equivalence between digital technology, interactive art and emancipation. But when talking about the emancipating or democratic potentials, or non-potentials, *of art*, it makes very little sense to place certain technologies, media, or concepts in a privileged position – not even the notions of interactivity and collaboration.

Notes

1. Peter Weibel, 'Art and Democracy', in *Making Things Public: Atmospheres of Democracy,* eds. Bruno Latour and Peter Weibel (Cambridge, Mass.: MIT Press, 2005), 1034.

2. Weibel, op.cit., 1035.

3. Lars Qvortrup, 'Digital avantgarde', *Passage* 48 (2003): 31.

4. Christiane Paul, *Digital art* (London: Thames and Hudson, 2003), 67–68.

5. Paul, *Digital Art*, 67 (emphasis added).

6. Mark Tribe, 'A brief introduction to digital art', in *Enter Action – digital art now*, exhibition catalogue (Aarhus: ARoS, Aarhus Kunstmuseum, 2009), 60. (emphasis added).

7. Søren Pold, *Genrer i digital kunst* (Aarhus: Center for digital æstetikforskning, 2005), 2 (emphasis added, my translation).

8. Clement Greenberg, 'Towards a Newer Laocoon', in *Perceptions and Judgments 1939–1944*, ed. John O'Brian, vol. 1 of *Clement Greenberg: The Collected Essays and Criticism*, ed. John O'Brian (Chicago: University of Chicago Press, 1988), 32.

9. Peter Bürger, *Theory of the Avant-Garde* (Minneapolis: University of Minnesota Press, 1984), 22.

10. Charlie Gere, *Digital Culture* (London: Reaktion Books, 2008).

11. Mikkel Bolt, 'Kybernetik, kapitalisme og tomater', *Passepartout* 27 (2007).

12. Hans Magnus Enzensberger, 'Constituents of a Theory of the Media', *New Left Review* Nov./Dec. (1970): 29.

13. Lars Elleström, 'The Modalities of Media: A Model for Understanding Intermedial Relations', in *Media Borders, Multimodality and Intermediality*, ed. Lars Elleström (Basingstoke: Palgrave Macmillan, 2010), 26.

14. Elleström, op.cit., 26.

15. Arthur C. Danto, 'The Artworld', *Journal of Philosophy* 61, no. 19 (Oct. 15, 1964) and George Dickie, *Art and Value* (Oxford: Blackwell Publishers, 2001).

16. Elleström, 'The Modalities of Media: A Model for Understanding Intermedial Relations', 32 (emphasis added).

17. Lev Manovich, *The Language of New Media* (Cambridge, Mass: MIT Press, 2001), 55.

18. Uwe Seifert, 'The Co-Evolution of Humans and Machines', in *Paradoxes of interactivity,* eds. Uwe Seifert, Jin Hyun Kim, and Anthony Moore (Bielefeld: Transcript Verlag, 2008), 11.

19. Hugh Dubberly, Paul Pangaro, and Usman Hague, 'What is Interaction? Are there Different Types?', *Interactions* 16, no. 1 (January–February 2009): 70.

20. Paul, *Digital Art*, 68.

21. Erkki Huthamo, 'Trouble at the interface 2.0', www.neme.org/591/trouble-at-the-interface-2 (Feb. 27, 2007).

22. Nicolas Bourriaud, *Relational Aesthetics* (Dijon: Les presses du réel, 2002).

23. Hal Foster, 'Chat Rooms', in *Participation,* ed. Claire Bishop (London: Whitechapel, 2006), 193.

24. Claire Bishop, 'Antagonism and Relational Aesthetics', *October*, no. 110 (Fall 2004): 62 (emphasis added).

25. Bishop, 'Antagonism and Relational Aesthetics', 66 (original emphasis).

26. Franco Berardi ('Bifo'). 'Biopolitics and Connective Mutation.' *Culture Machine*, Vol 7 (2005): http://www.culturemachine.net/index.php/cm/article/view/27/34

27. Enzensberger, 'Constituents of a Theory of the Media', 23.

28. Op.cit., 26.

29. Jacques Rancière, 'The Emancipated Spectator', *Artforum*, March (2007): 277.

30. Jacques Rancière, op.cit., 279.

31. David Rokeby, 'Transforming Mirrors', in *Critical Issues in Interactive Media,* ed. Simon Penny (New York: State University of New York, 1995), 154.

32. David Rokeby, 'Transforming Mirrors', 155.

33. Henry Jenkins, *Convergence Culture: Where Old and New Media Collide* (New York: New York University Press, 2006), 6.

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