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Immersiveness and Interactivity in Documentary Storytelling. The *Apnea* Case Study

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Abstract

The paper aims to investigate the potential and the boundaries of immersive experience in the field of interactive documentary through Apnea, a case study.

Apnea is a media art project concerning migrants who are crossing the central Mediterranean route, one of the main access routes to Europe. In 2016 a multimedia, interactive and immersive VR installation on the politically significant shipwreck of 3 October 2013, which occurred in the Lampedusa sea (Sicily, Italy), resulted from the project. A total of 368 people lost their lives in that shipwreck.

The paper will contextualise Apnea in the interactive documentary field. Furthermore, the Apnea approach to immersiveness and interactivity will be investigated. The goal is to reveal, through the Apnea example, the ways in which interactive and immersive technologies can offer a profoundly different way of experiencing a documentary for the user and how this new language is evolving.

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1. Theoretical Background

The IDFA DocLab festival programme states: “The mission of IDFA DocLab is to showcase interactive documentaries and other new digital artforms that successfully push the boundaries of documentary storytelling in the age of the interface. Projects are curated and presented online, as well as during live cinema events, exhibitions, workshops and industry panels.” (www.doclab.org/about/).

It is a description that highlights the effort to define in a simple way the complex concept of interactive documentary, and, at the same time, it brings out the potential and challenges of this type of innovative project.

On the MIT Open Documentary Lab website we find an analogous and complementary description: “The Lab understands Documentary as a project rather than as a genre bound to a particular medium: documentary offers ways of exploring, representing, and critically engaging the world. It explores the potentials of emerging technologies and techniques to enhance the documentary project by including new voices, telling new stories and reaching new publics.” (opendoclab.mit.edu/about-3).

The discussion around the concept of immersiveness and its relationship with interactivity is very complex and controversial, especially when focusing on the impact of these technologies on traditional storytelling.

Janet Murray in her book “Inventing The Medium” states:

“Interactivity is rightly used to refer to the combination of procedural (computer processing) and participatory (human-directed) affordances of the digital medium. When these two affordances fit together well, they create the satisfying experience of agency.” (Murray 2012, 100)

For Janet Murray 'agency' is not a property of the artefact, it is only present or not in the experience of the interactor, it is the opposite of frustration. It is when interactivity is working well for the user. With regards to immersion Murray says:

“Immersion is experiential and not a function of the size or volume of the stimulus, but of the engagement or distractibility of the interactor [...] In digital environments, the experience of immersion is reinforced by the encyclopedic and spatial affordances of the medium, by its enormous capacity and its openness to navigation in simulated landscapes or information spaces.” (Murray 2012, 101-102)

Murray talks about a generic “immersivity”, different from the contemporary immersion that refers to 360° and site specific experiences. Despite this, the useful lesson that comes to us from Murray's analysis is that agency and immersion are mutually reinforcing. When we engage with an immersive world and it responds to us as we expect it to, revealing deeper levels of content, greater detail in its coverage, we become more deeply immersed.

This idea of reinforcement is very useful as it allows us to see interactivity and immersion as complementary aspects of the same experience.

All these aspects should be considered in analysing the immersive and interactive audiovisual digital narration. In particular, there appear to be two criticalities that every immersive and interactive project must face:

1. the problem of how to construct effective stories designed for immersive use (such as, for example, 360° images);
2. the transformation of an audiovisual product into an open (interactive) project, “performed” by users.

1.1 The Structuring of Storytelling Designed for a 360° Immersive Use Experience

As suggested by the Apnea case study described below, a possible choice for effectively accompanying the viewer/user within an immersive story is to move away from the simulation of

reality, opting for emotional and symbolic audiovisual poetics. The images and sounds do not refer to what is present in reality (as in the best documentary tradition) but open the doors of perception to “what is missing” and what activates the emotions.

Immersive images, and, in a different way, also interactive images, call into question the relationship between realism, illusion and simulation, typical of the filmic analysis (Manovich 2001), as proposed, amongst others, by André Bazin according to whom cinematographic technology is the realisation of the ancient myth of mimesis (Bazin 1999). Various filmic strategies and technologies gradually allow the viewer to have a relationship with the image which is more intimate than anything that is possible in reality. For Bazin, this dynamic implies an “active exploration” of visual reality. A classic example is the depth of field, thanks to which the viewer can freely explore the space of the image proposed by the film; in this way, cinema guarantees a sort of “total realism”.

In the history of its technological and language advances, cinema has followed the direction of an ever greater complete and total representation of reality. Bazin explains to us that a realistic representation is not just the reconstruction of a perfect illusion of the outside world (through sound, colour and form) but the capacity of the filmic image to come closer to the perceptive and cognitive dynamics of the natural vision.

With virtual reality, Bazin's promise of “total realism” seems closer, literally at the user's fingertips, thanks to the multi-sensory nature of the use of VR systems. The solicitation of multiple senses (including touch) is the asset that takes VR closer to cinematographic total realism in Bazin's view. However, the multi-sensory approach is also an element of criticality, as demonstrated by the “cyber-sickness” effect - related to several viewing variables and latencies in the system - that we often experience when wearing a VR viewer and watching immersive images: the image becomes a body, the visual communication ends up being dominated by the sensory dimension, by contact, focusing on the physical channel. If the contents and the user experience are not well-formed and do not take account of sensorial alignment to the perceptive and cognitive dynamics of natural vision and movement, the result is to make us feel like viewers who have just got off a *Tagada carousel*.

The technological limits of VR first, and 360° images taken today, remind us that the definition of realism provided by Goldsmith (President of the SMPE, Society of Motion Picture Engineers) in 1934 is still valid today: “the production of an acceptable representation of reality”. The degree of acceptability is determined by a sort of tacit agreement between media industry and viewers, between available technologies and user expectations. In other words, the transition to these technologies allows us to acquire something different at the expense of something else. Immersive and interactive images are not just something “extra” but something different.

This stance is also taken in the analysis by the cinema critic and director Jean-Louis Comolli (Comolli 1980), according to whom the evolution of cinema is characterised by the creation of new technologies and techniques which replace previous ones. Technology continues by additions and replacements. And in the case of cinema the aim is to create greater realism, as demonstrated by the transition to panchromatic film which is able to reproduce colours, in black and white, as well as infinite grey shades, obtaining as a result a much more realistic and true to reality rendering of colours. The transition to panchromatic film improves the quality of the image; however, it also determines losses. The realistic effect, in fact, was previously based upon the depth of field; with the panchromatic technique, the depth of field - the perspective - loses importance in the production of effects of reality, being replaced by shading, by colour, which allows for the same, if not better, effects of reality.

As Lev Manovich (2001) reminds us, the same thing happens in the world of animation: in 3D animations, we move from schematic representations to cartoons in which the effects of reality are based only on indications of volume, moving on, in the Eighties, to the creation of greater depth, until reaching the new techniques of shading which bring us closer to photorealism and to new types of movements, lateral ones, in a new, less deep space.

And again, if we consider the images taken with 360° video cameras and look at them through a VR viewer, we acquire a new immersive view (we are literally inside the filmic image which covers us, embraces us, surrounds us) but we lose the definition of images, we lose the photographic freedom that we have become accustomed to in cinema, as 360 video cameras have limitations in that sense.

Another problematic element in the transition from “linear” stories to interactive storytelling is the swing between immersion and detachment in digital interactivity. Traditional cinema aims to maintain the continuity of the illusion for the whole duration of the performance. Unlike total realism, the aesthetics of new media fluctuates between concealing and revealing the production

mechanisms of the illusion. In new media, the concept of “perception in a state of distraction” of Benjamin (1966) is realised, exponentially. The periodic reappearance of the machine, the tool, in interactive media, the continuous presence of the communication channel in the message (from the menus to the choices offered to the user when using content) prevent the user from falling into the dream world of the illusion for a long time, forcing him to move alternatively from concentration to suspension.

Digital interactivity structures the temporal experience of the subject like a series of periodic fluctuations between the role of viewer and the role of user, between an immersive (passive) perception and a watchful (active) action. These fluctuations are at the basis of the specific experience in using an interactive image. As Kaja Silverman (1983) says, these cyclical fluctuations between illusion and its deconstruction constitute a type of suture carried out by users: having to complete periodically the interactive narration with active participation, the person becomes trapped in it, the periodic fluctuations between illusion and its suspension are necessary to fully involve the person in the illusion.

1.2 The Image, from Closed Content to Open Project “Performed” by Users

Relational Art (Bourriaud 2010) is an art that takes as its theoretical horizon the sphere of human interactions and the social context, rather than the affirmation of an autonomous and private symbolic space. In relational art, the work is no longer just a space to be covered but a “duration to be experienced”. Immersive and interactive images are constitutively relational in the sense given to them by Bourriaud: the image is no longer solely a “space of vision” but also a “time of interaction”.

Following this line of thought, Lev Manovich states that the “navigable space” is one of the main forms in which data and information are structured in digital media. VR cinema (and that of immersive images) is a spatial cinema; it is a space navigable by the viewer's eye.

The navigable space as a dominant form in digital media leads us to reflect on the need to overcome the historical contrast between narration and description developed in the field of narratology, according to which the description would be defined negatively as the absence of narration. In space-based digital media, this contrast is replaced by that between narrative actions and exploratory actions.

The navigable space of 360 images used in VR is the realm of the exploratory vision.

The exploratory vision is not only the means to proceed along the narration but it has a value in itself, the navigation and exploration are the narration. The space becomes a medium like the others (audio, video, image, text). The concept of interactive navigable space, paradoxically, shifts the importance from space to time, exploration is space and time, it is a liberal time that does not follow the narration, as Bourriaud says it is a “time to be experienced”, and it is the user that decides this time and no longer the director, as in the case of traditional cinema.

These elements lead us to define the *performative* nature of the audiovisual work, in the transition from passivity of the vision to immersiveness. The immersive and interactive audiovisual image is continuously performed by the audience which interacts with the contents. The content is never static; the work is a process that involves a certain degree of indeterminacy in the situational encounter between content, medium, user-audience.

Based upon this multidisciplinary approach and theoretical framework, now we will analyse the *Apnea* project and how these innovative documentary forms can lead to the direct and participatory involvement of the audience/users.

2. The *Apnea* Project

Apnea is a media art project concerning migrants crossing the central Mediterranean route, one of the main access routes to Europe. On 3 October 2013, a shipwreck occurred in the Lampedusa sea (Sicily – Italy). During the rescue operations of the castaways, a few hundred meters from the coast, 368 bodies were found and laid out on the beach. The unexpected involvement of tourists and the island's population in the rescue operations and the shocking image of the bodies exposed on the beach marked a change in public opinion and the beginning of major government operations in Italy and in Europe.

The *Apnea* project, begun in Turin in 2015, moved for a month to Lampedusa in August 2016. The journey, whose intention was to understand the island's real situation, allowed the project to create a documentation and a direct connection with: space/border/sea; population that

participated in the rescue operations; objects found by police on the bodies of the shipwreck victims; survivors of the shipwreck and their stories of migration to Europe.

In 2016 an interactive and immersive installation took shape from this tragic event.

Apnea consists of three moments/environments which involve visitors in a sensory journey, taking them, step by step, on an immersive experience.

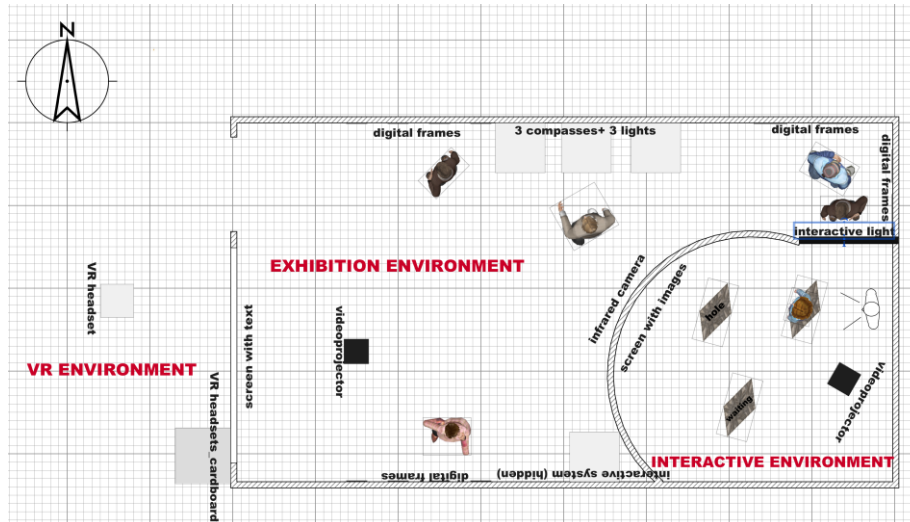


Figure 1. Apnea environments.

Visitors begin the journey with an exhibition made up of photographs, videos and texts relating to the objects found on the bodies of the victims and some compasses found on boats near to Lampedusa. The objects are isolated, decontextualised and immersed in a procedural soundscape that is recomposed in real time.



Figure 2. Objects found on the bodies of the victims (Photo by Michele Cattani).

The water, the sea and, again, the objects are the central element of the following moments/spaces:

- A space with an interactive projection. The visitor's movement modifies the audiovisual environment in real time. In a dark room there is a semi-circular screen (270°) with a video projection of the seabed of Lampedusa run across by jellyfishes. The room is traced

through an infrared camera that detects the user's presence. The user interacts with the audiovisual world through a processing data software. Jellyfishes follow the movements of the user in the room, giving a disorienting feeling of immersive slow movement. At the entrance of the room there are voices of migrants recorded live or via radio by NGOs. The situation changes when the user steps on one of the 3 text written on the floor. Each text represents a state of anguish connected with the sea: waiting, the impossibility of reaching the beach, death. Depending on the text, video projection and audio change as well.



Figure 3. An interactive environment (Photo by Andrea Macchi).

- A 360° video that allows visitors to dive into the Lampedusa sea.



Figure 4. 360° camera in Lampedusa deep seas (Photo by Michele Cattani).



Figure 4. Photo by Andrea Macchia.

Apnea documents the real. It speaks of a tragic event and a contemporary issue using interactive and immersive technologies for the purpose of raising awareness, basing its approach on generating a personal, emotional sense of involvement in each individual.

In addition, the planning and implementation of *Apnea* followed participatory methodologies, becoming a fully fledged research-action project (Reason & Bradbury 2001). The research-action is not limited to analysing a problem but constructs solutions together with the persons involved in the problem, which in the project become a *community of practice* oriented towards a common interest. *Apnea* involved different audiences in a year-long participatory planning.

3. *Apnea* as an Interactive Documentary

To contextualise *Apnea* within the interactive documentary field we will refer to some definitions and taxonomies proposed by the team of experts around the i-Docs symposia (i-docs.org). This is an interesting and prestigious project that has expanded the definition of interactive documentary to include any digital platform that facilitates interactivity (such as the internet, DVD, mobiles, GPS devices and gallery installations).

Indeed, Judith Aston and Sandra Gaudenzi believe that “any project that starts with an intention to document the ‘real’ and that uses digital interactive technology to realize this intention can be considered an interactive documentary.” (Aston & Gaudenzi 2012, 125-126). A concept inherited from Galloway et al.’s definition: “any documentary that uses interactivity as a core part of its delivery mechanism.” (Galloway et al. 2007, 330-331).

These definitions are also well-suited to *Apnea*, a project that documents the “real” and uses “digital interactive technology to realise this intention”.

Gaudenzi proceeds further by proposing a taxonomy not only based on the role of the user who intervenes to modify text and images, but rather on “the meaning and consequences of such ability.” (Gaudenzi 2013, 38).

In this sense, Gaudenzi proposes four modes of interaction which emerge from her investigations regarding interactive documentary projects that she considers relevant:

“Whether interactivity is semi-closed (when the user can browse but not change the content), semi-open (when the user can participate but not change the structure of the interactive documentary) or completely open (when the user and the interactive documentary constantly change and adapt to each other) will determine what type of interactive documentary they are. I have proposed to call those different modes of interaction the conversational, the hypertext, the participatory and the experiential mode.” (Gaudenzi 2013, 69)

Here, we will focus only on the experiential mode as a method that we consider appropriate to contextualise *Apnea* more precisely. Gaudenzi describes this mode of interaction as follows:

“Consciously referring to theories of affect (James, Deleuze, Guattari and Massumi) I will call such context a space of affective experience – where felt reality is more than what is graspable by our senses (felt experience); it is a transitional state, the result of a complex and dynamic relation between physical abilities, cultural interpretations, different levels and understanding of space and time resulting from the constant changing relation between the individual and her environment.” (Gaudenzi 2013, 65)

Gaudenzi specifies that:

“Experiential documentaries don't need to be participatory. Obviously interactors need to 'participate', but if they don't add to the production process of the piece they will not be called participatory in this research. In other words: if the participant accesses content linked to a space, just by walking through it, but does not add content to such database, I would argue that the project should still be considered an experiential one – because it affects the perception of physical space, and therefore transforms it for the user.” (Gaudenzi 2013, 63)

The affinity of *Apnea* with these descriptions is quite clear. *Apnea* takes place in three exploratory and dynamic spaces, although in the same physical place. *Apnea*'s aim is to bring the user to an affective experience where space and time are perceived in an intimate, personal and variable way. The path, always linked to the events that occurred on 3 October 2013, leads the user from a non-immersive to an immersive situation (exhibition of monitors and objects/180° interactive semi-immersive videomapping/VR 360° video) through a sensitive and emotionally recognisable experience.

4. *Apnea* VR experience, immersiveness in proving the “real”

In his book “Virtual Art”, talking about the “constitution of presence” in the field of virtual reality, Oliver Grau says: “The technological goal, as stated by nearly all researchers of presence, is to give the viewer the strongest impression possible of being at the location where the images are. This requires the most exact adaptation of illusionary information to the physiological disposition of the human senses.” (Grau 2003, 14). At the same time: “It is not possible for any art to reproduce reality in its entirety, and we must remain aware that there is no objective appropriation of reality—Plato’s metaphor of the cave shows that. It is only interpretations that are decisive.” (Grau 2003, 17).

In this way, Grau draws attention to the difficult relationship that is established between immersiveness and reality/realism, a central point in Virtual Reality, particularly in the documentary field, which is unlikely to find simple answers.

In the section of *Apnea* concerning the VR experience (the third moment/space constituted by underwater images used with a VR viewer) the problems linked to the relationship between immersive image and real image emerge from the very first moments of its realisation.

At an initial planning phase, the VR experience was to take the user to the Lampedusa deep sea to recreate a situation of suffocation due to drowning. This proposal was immediately set aside. It was clear that it was impossible to reproduce reality. Oliver Grau again reiterates that immersiveness, rather than dealing with the simulation of reality, deals with what is “given in essence”, a plausible “as if”:

“The expression ‘virtual reality’ is a paradox, a contradiction in terms, and it describes a space of possibility or impossibility formed by illusionary addresses to the senses. In contrast to simulation, which does not have to be immersive and refers primarily to the factual or what is possible under the laws of nature, using the strategy of immersion virtual reality formulates what is ‘given in essence’, a plausible ‘as if’ that can open up utopian or fantasy spaces.” (Grau 2003, 15)

The concept “given in essence” is also effective for describing the creative process of the VR experience in *Apnea*. After the initial and disappointing attempts to “simulate” reality, the 360 video recordings, actually filmed in the Lampedusa sea, are created and processed in post-production to obtain the creation of an archetypal world. A space in which elements of the real (the Lampedusa sea, the real presence of the diver who saved the lives, on that 3 October, of many people, a sculpture taken to the sea bed) mix with dreamlike suggestions (the objects, sounds, added in post-production) in an attempt to reveal a single “essential” moment of profound solitude through the fragments of a collective unconscious.

The user is immersed in this archetypal space/time through direct involvement, personally, produced by some significant events on the video, therefore through the writing rather than through the complex and ineffective reproduction of a body in the sea. This does not mean that the user's real sensorimotor activity is not taken into consideration, but the expedient of the impossibility of moving from inside a bubble suspended in the deep sea is used to give to the user the physical sensation that his body is imprisoned in the water, in solitude and with no way out.

In his “Bodies in Code” Mark Hansen, referring to Wann and Rushton, states: “what is crucial is not simulating a visually ‘realistic’ environment in purely visual terms, but rather designing an environment capable of inducing a compelling sensorimotor correlation in the participant.” (Hansen 2006, 117). There are, therefore, no attempts to reproduce the real, but the immersive effect is created through the translation of reality into the archetypal and through the frustration of the sensorimotor intelligence to allow the user to recognise, profoundly, the sensory experience of solitude in the deep sea.

The use of interactive and immersive technologies can lead to a new method of experimenting and exploring the documentary in a profound and engaging way for the user, but we are also convinced that there are still many steps to be taken in order to develop a new language. In particular, the relationship between immersiveness/interactivity and the reproduction of “the real” is crucial and still very critical. In this article we have used the *Apnea* case study to identify some of the questions raised around the Interactive Documentary field in terms of language and user experience.

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References

- Aston, Judith, and Sandra Gaudenzi. "Interactive Documentary: Setting the Field". *Studies in Documentary Film* 6.2 (2012): 125-139.
- Bailey, Jakki O. et al. "When Does Virtual Embodiment Change Our Minds?". *Presence* 25.3 (2016): 222–233.
- Bazin, André. *Che cosa è il cinema? Il film come opera d'arte e come mito nella riflessione di un maestro della critica*. Milano: Garzanti, 1999.
- Benjamin, Walter. *L'opera d'arte nell'epoca della sua riproducibilità tecnica*. Torino: Il Mulino, 1966.
- Bourriaud, Nicolas. *Estetica Relazionale*. Milano: Postmedia Books, 2010.
- Comolli, Jean-Louis. "Machines of the Visible". In De Lauretis T., Heath S. (eds) *The Cinematic Apparatus*, London: Palgrave Macmillan, 1980.
- De la Peña, Nonny et al. "Immersive Journalism: Immersive Virtual Reality for the First-Person Experience of News". *Presence* 19.4 (2010): 291–301.
- Dika, Penesta. "Interactive Digital Art: Visual Motifs and their Meaning". Thesis. Institute of Interface Cultures, University of Art and Industrial Design in Linz, Department for Media Studies, 2008.
- Galloway, Dayna et al. "From Michael Moore to JFK reloaded: Towards a working model of interactive documentary". *Journal of Media Practice* 8.3 (2007): 325–339.
- Gaudenzi, Sandra. "The Living Documentary: from representing reality to co-creating reality in digital interactive documentary". PhD thesis. Goldsmiths (Centre for Cultural Studies), University of London. London, January 2013.
- Gifreu, Aranu. "The Interactive Documentary. Definition Proposal and Basic Features of the Emerging Genre". McLuhan Galaxy. Conference Proceedings (2011): 354-365. Cambridge/London: The MIT Press, 2003.
- Grau, Oliver. *Virtual Art: From Illusion to Immersion*. Cambridge/London: The MIT Press, 2003.
- Hakalisto, Simo. "Immersion in interactive documentaries: a game-studies-driven approach in a case study of bear 71". Master's Thesis. Faculty of Communication Sciences (COMS) Master's Degree Programme in Internet and Game Studies. University of Tampere, 2017.
- Hansen, Mark B.N. *Bodies in code*. New York/London: Routledge, 2006.
- Kate, Nash. "What is interactivity for? The social dimension of webdocumentary participation". *Continuum* 28:3 (2014): 383-395.
- Kwastek, Katja. *Aesthetics of Interaction in Digital Art*. Cambridge/London: The MIT Press, 2013.
- Manovich, Lev. *The Language of New Media*. Cambridge/London: The MIT press, 2001.
- Mazali, Tatiana. "Performance digitali. Partecipazione, coinvolgimento, 'mediazione.'" In S. Arcagni (ed.), *I media digitali e l'interazione uomo-macchina*, Roma: Aracne, 2015.

Mazali, Tatiana and Mazzocchi F., Pizzo A. (eds.). *Marcel.Li Antunez Roca e la performatività digitale*. Bonanno Editore, 2011.

Mazali, Tatiana. *Ex-Peau-Sition*. Milano. Guerini e Associati, 2007.

Moser, Mary Anne (ed.). *Immersed in Technology. Art and Virtual Environments*. Leonardo Book, 1996.

Murray, Janet H. *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. Cambridge/London: The MIT Press, 1998.

Murray, Janet H. *Inventing the medium: principles of Interaction Design as a Cultural Practice*. Cambridge/London: The MIT Press, 2012.

Reason, Peter and Bradbury H. *Handbook of Action Research: Participative Inquiry and Practice*, Sage, 2001.

Silverman, Kaja. *The Subject of Semiotics*. Oxford: Oxford University Press, 1983.

Web sources

Davies Char: <http://www.immersence.com/>

MIT Open Documentary Lab: <http://opendoclab.mit.edu/>

IDFA DocLab: <https://www.doclab.org/about/>

I-Docs: <http://i-docs.org/>

Interactive Factual: <http://www.interactivefactual.net/>

Murray Janet H.: <https://inventingthemedium.com/>

Officine Sintetiche (Apnea) :<https://vimeo.com/267076575>,
<http://www.officinesintetiche.it/en/?portfolio=apnea>

Presence: Virtual and Augmented Reality (The MIT Press Journals):
<https://www.mitpressjournals.org/loi/pvar>