THE FORKING PATHS

INTERACTIVE FILM AND MEDIA

Editors
Bruno Mendes da Silva
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Claudia Giannetti is a researcher specialized in contemporary art, aesthetics, media art and the relation between art, science and technology. She is a theoretician, writer and exhibitions curator. For 18 years she war director of institutions and art centres in Spain, Portugal and Germany, including MECAD\ Media Centre of Art & Design (Barcelona) and the Edith-Russ-Haus for Media Art (Oldenburg, Germany). She has curated more than hundred exhibitions and cultural events in international museums. She was Professor in Spanish and Portuguese universities for the past two decades, and visiting professor and lecturer worldwide. She performs the function of adviser in several international multimedia and media art projects. Giannetti has published more than 160 articles and fifteen books in various languages, including: *Ars Telematica –Telecomunication, Internet and Cyberspace* (Lisbon, 1998; Barcelona, 1998); *Aesthetics of the Digital –Syntopy of Art, Science and Technology* (Barcelona, 2002; New York/Vienna, 2004; Lisbon, 2011); *The Capricious Reason in the 21st Century: The avatars of the post-industrial information society* (Las Palmas, 2006); *The Discreet Charm of Technology* (Madrid/ Badajoz, 2008); *AnArchive(s) – A Minimal Encyclopedia on Archaeology and Variantology of the Arts and Media* (Oldenburg, 2014); *Image and Media Ecology. Art and Technology: Praxis and Aesthetics* (Lisbon, 2017).

Jeffrey Shaw is an Australian visual artist and leading figure in new media art who, since the late 60's, has pioneered the use of digital media technologies in the fields of virtual and augmented reality, immersive visualization environments, navigable cinematic systems and interactive narrative. His seminal exploration of new technologies such as computers and interactive interfaces allowed Shaw to introduce new operational and aesthetic dimensions into contemporary art that have profoundly influenced generations of media artists. Shaw was the founding director of the ZKM Institute for Visual Media Karlsruhe, Germany, from 1991 to 2002. Currently he is Yeung Kin Man Chair Professor of Media Art at City University Hong Kong, Director of the CityU Centre for Applied Computing and Interactive Media. He is also Visiting Professor at Central Academy of Fine Arts, Beijing, China, Visiting Professor at EPFL, Lausanne, Switzerland and Honorary Professor at the Danube University, Krems, Austria.During his career, Shaw's works have been presented at leading public galleries museums including the Stedelijk Museum Amsterdam, Centre Georges Pompidou Paris, Kunsthalle Bern, Guggenheim Museum New York, ZKM Karlsruhe, Hayward Gallery London and Power Station of Art Shanghai. He has received numerous honours and awards including an Australian Research Council Federation Fellowship; the Immagine Elettronica Prize, Ferrara, Italy; the Oribe Prize, Gifu, Japan and the SAT Lifetime Achievement Award, Montreal, Canada. In 2015 he was awarded the Prix Ars Electronica for Visionary Pioneers of Media Art, and in 2020 the ACM SIGGRAPH Distinguished Artist Award for Lifetime Achievement in Digital Art.

Peter Lunenfeld is professor and vice chair of the Department of Design Media Arts at UCLA, and is a member of Digital and Urban Humanities faculties. His most recent book is *City at the Edge of Forever: Los Angeles Reimagined* (New York: Viking, 2020).

Hartmut Koenitz is an Associate Professor at Södertörn University in Sweden, a visiting researcher at the University of Amsterdam, and a visiting research fellow at Trinity College Dublin. He is currently writing a book on "Understanding Interactive Digital Narratives" to be published by Routledge in 2021. His research is concerned with the theory, practice, education and societal impact of interactive narratives and games. He has published over 50 scholarly publications including the co-edited volume Interactive Digital Narrative – history, theory and practice (Routledge 2015). Koenitz is the chair of the EU COST Action 18230 INDCOR (Interactive Narrative Design for Complexity Representations – https://indcor.eu). He is also the president of ARDIN, the Association for Research in Digital Interactive Narratives (https://ardin.online). Koenitz holds a PhD from the Georgia Institute of Technology on the theory and practice of Interactive Digital Narrative. Koenitz is the creator of the ASAPS authoring tool, which has been used to create more than 150 works. He is also a visual artist, and his works have been shown in Atlanta, Paris, Istanbul, Seoul, Copenhagen and Porto. His latest artwork, The Multiple Lives of Walter B. is a physical installation that explores virtual biographies of Walter Benjamin.

Bruno Mendes da Silva has a postdoctoral degree in the scope of the project "The forking paths: Hypotheses of Interactivity for the Cinema of the Future", he earned a PhD in Literature and Cinema (Comparative Literature) by UAlg, postgraduate degree in Arts Management from the Institute of European Studies of Macau (IEEM) and a degree in Cinema and Video. He is coordinator of the Communication Sciences Department at the School of Education and Communication at the University of Algarve. He is Vice-coordinator of the Center for Research in Arts and Communication. He is a Guest Professor at Saint Joseph University of Macau. He was a TV Producer and Director at Teledifusão de Macau and has been invited to participate in international video, digital media and film festivals. He has participated in 18 scientific projects and is the author of several books, book chapters and other scientific publications (over 70).

Mirian Tavares is an Associate Professor at the University of Algarve. With an academic background in Communication Sciences, Semiotics and Cultural Studies (she has earned a PhD in Contemporary Communication and Culture from the Federal University of Bahia), she has developed her research and theoretical work in the fields of Cinema, Literature and other Arts, as well as in the areas of film and arts aesthetics. As a Professor at the University of Algarve, she took part in the preparation of the Degree in Visual Arts, the Master's and PhD Degrees in Communication, Culture and Arts, and the PhD in Digital Media-Art. She is currently the Coordinator of CIAC – Centre for Research in Arts and Communication, and Vice-coordinator of the PhD in Digital Media-Art.

António Araújo has a degree in Physics (1995) and a PhD in Mathematics from the Faculty of Sciences of the University of Lisbon (2011). He is an Assistant Professor at Universidade Aberta, where he has been lecturing since 2003. He has been dividing his scientific research between two main areas within the study of geometry. Recently, he has devoted himself to the study of the application of geometry to visual arts, in particular to the study of the curvilinear perspectives and anamorphoses, both in the scope of classical techniques and in their relation with the algorithms and techniques of digital art. This research maintains a close connection with his parallel ongoing activities in the field of plastic arts and illustration. He is a member of both CIAC – Centre for Research in Arts and Communication (Universidade Aberta) and CMAF-CIO – Center for Mathematics, Fundamental Applications and Operations Research.

Susana Costa is a PhD student in Digital Media-Art. In addition to teaching, to which she has dedicated part of her professional career, she has worked in the last 5 years as a science and technology manager at the Research Center for Arts and Communication. She has recently participated in several funded projects and integrated several working groups in the area of education and technology. She has publications in national and international magazines and bookchapters.

CONTENTS

PRESENT, PAST AND FUTURE

The Forking Paths, a project by the Research Center for Arts and Communication (CIAC), began in 2013, when a group of researchers from the center began a theoretical and practical research process in the field of filmic interactivity. Since then, dozens of scientific publications have been written and the four interactive film experiences produced within the scope of the project featured in leading international festivals, such as *FILE*, in São Paulo, Brazil, or *Script Road*, in Macau, China.

In 2021, some of the world's leading experts in interactive film and media join CIAC researchers. The result is the book *The Forking Paths*, which revisits historically, socially, pedagogically and aesthetically the last 50 years of audiovisual interactivity.

In the first chapter, Claudia Giannetti introduces us to the precursors and the development of interactive audiovisual, from last century's early 70s to the first decade of the current century. Jeffrey Shaw presents us with "Future Cinema", a visionary text written precisely 20 years ago and now revised, a text which impresses by its timeliness and the way it remaps and redirects the history of cinema. Peter Lunenfeld writes about the enthralling Multimediated project on immersion and pedagogy entitled "Colloidal Suspension: Immersion and the

Pedagogies of Making". In the chapter "Remediation or specificity? Interactive digital narrative and other interactive forms as continuation or new beginning", Hartmut Koenitz opens an important discussion on the issue of conceptual framing of interactive digital narratives. Finally, the last chapter, written by CIAC researchers Bruno Mendes da Silva, Mirian Tavares, António Araújo and Susana Costa, relates filmic interactivity with surrealism and temporal perception, by presenting the project's last interactive artifact, the *Forking Paths: Cadavre Exquis*, launched in 2019, and by contextualizing its production in the history of cinema and interactive film.

By contextualizing and rethinking the young history of film and interactive media, this book points to a hypothetical future of cinema, where we discover hints that seem to indicate a possible evolution regarding audiovisual syntax, although morphological issues remain unaltered. The relativity of the concept of plan, which changes from objective to subjective by taking into account the possibility of multiple choices, as well as the multiple reinterpretations it offers to the idea of sequence are two examples of the shift in audiovisual syntax. It is also important to mention the relevance of academic experimentation, which, rather than limiting itself to theorizing, should lead to *praxis* whenever possible, i.e. a practical demonstration of the developed theories. The advent of artificial intelligence anticipates a possible rupture with pre-established contents related to the real image, thus enabling the emergence of a new generation of interactive films. Soon, viewers will be able to acquire creative powers that are beyond their control as well as beyond the control of the original author. We are talking about a generation of unpredictable content. This will certainly be a rupture in the logical sequence of the history of cinema, a turning point where film can become something it has never been before: a complete audiovisual experience.

Faro, June 2021
Bruno Mendes da Silva

BRIEF NOTES ON A PROPOSED ITINERARY OF THE FIRST 35 YEARS OF INTERACTIVE AUDIOVISUAL AND TELECOMMUNICATION SYSTEMS (1970-2005)

Claudia Giannetti

This brief route through some of the main precursors of interactive audiovisual in the context of telecommunication systems does not claim to be exhaustive. Nor is it my goal to elaborate a historical approach, for which I would need a much longer type of text. As the title of the essay itself conveys, these are brief notes that allow younger readers and future generations to trace possible routes to the past and understand the origins of many of the artistic formats and proposals, with such a strong presence in our contemporary context.

PRECURSORS. TWENTIETH CENTURY ART AND TELECOMMUNICATION

More than a century and a half ago, Alexander Bain registered the first patent for a telegraphy device, which allowed the transmission of manuscripts and drawings. This model of the copying telegraph was debuted at the World's Fair in London, in 1851. I fulfilled the desire not only to communicate in writing through codes, but also "to see" images over a long distance. At the end of the 19th century, the optical telegraph could already send pictures in shades of gray with a reasonable definition.

Once the technology that allowed the transmission of remote spoken (radio, telephone) or written messages had been perfected, research focused on the emission of moving pictures, which culminated in the invention of television.

The first mechanical televisions (which did not use any other electronics, but a motor) were developed in the 1920s. Between 1934 and 1940, electronics were introduced and the transmission system was perfected. In 1934, Telefunken launched its 180-line model in Germany, which was debuted at the Grand German Radio Exhibition in Berlin. In the summer of 1936, Telefunken broadcast the Berlin Olympics on television, using Farnsworth and RCA equipment (with 343 lines and 30 frames per second).

The vindication of television as a medium for art was made public in 1952, in the "Manifesto del Movimento Spaziale per la Televisione" (Manifesto of the Spatial Movement for Television), written by the Argentine artist Lucio Fontana and signed by 16 other artists. In this manifesto, Fontana claimed the potential of both radio and television as new media for artistic creation.

However, the great challenge was to overcome the barriers of the monological structure of audiovisual telecommunication media and transform it into a bidirectional system that would allow interaction with the viewer.

1960s

ART AND TV

In the spirit of *Nouveau Realisme*, French artist César used a television set as an art object for the first time in an exhibition entitled *Antagonismes II – l'objet* (Paris, Musée des Arts Décoratifs, March 1962). In the same year, Isidoro Isou, the founder of *Lettrismus* —an avant-garde movement in literature and painting in the 1950s— also presented his TV-object in Paris, *La télévision dechiquetée ou l'anti-crétinisation* ("Jagged Television or Anti-Cretinization"), in which images transmitted by television were partially covered with lettrist hypergraphics.

In 1963, in his first exhibition, entitled *Exposition of Music – Electronic Television*, at the Parnass Gallery in Wuppertal, Germany, Nam June Paik used

televisions connected to the German channel, whose reception devices had been manipulated, causing random distortions. In the same year, Wolf Vostell exhibited his *Television Decollage* at the Smolin Gallery in New York. Vostell tried to manipulate television pictures through a process of *decollage* that he had developed. In 1964, Karl Gerstner exhibited an installation with twelve television sets, each with a different lens that caused a distorted vision of the images that were being transmitted. While César and Isou decontextualized the device and proposed its "dysfunctionality", the interest of Paik, Vostell and Gerstner was focused on the treatment of the audiovisual image in real time. This practice followed in the avant-garde tradition of experimentation in the fields of communication and audiovisual, and opening the way for the participation of the spectator in the work.

One of the most interesting proposals for the use of television as a medium for art was the *Fernsehgalerie* (Television Gallery), by Gerry Schum. Broadcast on German television in 1969–70, the works were a blend of experimental cinema, video art, land art and performance, and managed to motivate artists such as Joseph Beuys, Dennis Oppenheim, Robert Smithson, Walter de Maria, Gilbert & George or Richard Serra to develop specific projects for the television medium.

In 1969, the Howard Wise Gallery in New York opened *TV as a creative medium*, which would soon prove a milestone art show. The exhibition, in which Nam June Paik, Ira Schneider and Frank Gillette participated, celebrated television as a medium for art. The use of closed-circuit systems allowed the viewer to be introduced into the context of the audiovisual work in a rudimentary way, but nevertheless significant for the expansion of the concept of participation.

1970s

SATELLITE ART

The subject of audiovisual telecommunication associated to art underwent a decisive expansion in the 1970s, a time notorious for the emergence of new ideas and proposals in different parts of the world. In 1971, Waldemar Cordeiro, one

of the pioneers of *Computer Art*, published his significant *Manifiesto Arteônica*, where he expressed his conviction that "the crisis of contemporary art is a consequence of two variables: the inadequacy of traditional art media to transmit information, and the inefficiency of the information they carry in regards to language, thought and action."[1] Art centered on the material object would limit public access to the work and, for this reason, would keep on failing "to live up to the qualitative and quantitative cultural demands of modern society". "The use of electronic media may lead to a solution to the communicational problems of art, since telecommunications and other electronic resources require certain forms of image processing for their informational optimization."[2] Cordeiro's ideas about a global connection and a wide free access of the public to the work of art through telecommunication anticipated the basic concept of network art, which would achieve the "diversification of culture and a most complex feedback" between the work and the audience, aspired by the artist.

At that time, it was a question of researching the form and means of putting those ideas into practice.

In 1974 —the year in which the first commercial version of the ARPANET network emerged and the term Internet first appeared—, Nam June Paik conducted a study for the Rockefeller Foundation on "Media Planning for the Postindustrial Society"[3], in which he proposed the transformation of television into an expanded and interactive medium. The multiple benefits of this "expanded media" should constitute what he called "Broadband Communication Network", which would incorporate the fields of videotelephony, telefacsimile and interactive

[1] Waldemar Cordeiro (ed.), *arteônica – o uso criativo de meios eletrônicos nas artes*. São Paulo, Universidade de São Paulo, 1972, p. 3. See English translation: https://leonardo.info/isast/spec.projects/cordeiro.html

[2] *Ibid.*

[3] Nam June Paik, "Medienplanung für das nachindustrielle Zeitalter. Bis zum 21. Jahrhundert sind es nur noch 26 Jahre", in: *Nam June Paik: Werke 1946-1976 – Music-Fluxus-Video*, Cologne: Kölnischer Kunstverein, 1976; "Media Planning for the Post-Industrial Society. Electronic Super Highway. Travels with Nam June Paik", in: New York, Holly Solomon Gallery et.al., 1994. (See original text in: http://bardionson.com/Media_planning_for_the_postindustrial_age.pdf)

television. In this study, Paik insisted on the urgency to develop an electronic medium of global communication, and envisioned the creation of the "Electronic Superhighway", a term that he coined himself, which, according to the artist, was later appropriated by the Clinton administration: "Bill Clinton stole my idea", Paik claimed.

In addition to Paik's pioneering work with video art, his obstinacy to establish meta-communication resulted in one of his main contributions to the art of interactive telecommunication: his *Satellite Art* projects.[4] Carrying out an audiovisual work simultaneously and collectively and broadcasting it in real time from different continents were the objectives of *Nine Minutes Live*. It consisted of a satellite transmission of live performances in Europe and the United States during the inauguration of Documenta 6 in Kassel, in 1977, to more than thirty countries.

A year earlier, Douglas Davis had developed the first satellite art project, *Seven Thoughts*, at the Houston Astrodome, which was broadcast to all Comsat television receivers. During the ten-minute broadcast of his live performance, Davis spoke about his personal ideas in a completely empty stadium.

According to Paik, "So, just as Mozart mastered the newly invented clarinet, the satellite artist must compose his art from the beginning suitable to physical conditions and grammar. […] It must consider how to achieve a two-way connection between opposite sides of the earth; […] how to master differences in time; how to play with improvisation, in determinism, echoes, feedbacks, and empty spaces in the Cagean sense; and how to instantaneously manage the differences in culture, preconceptions, and common sense that exist between various nations. Satellite art must make the most of these elements […], creating a multitemporal, multispatial symphony."[5] With its potential for participatory audiovisual broadcasting, Satellite art should be transformed, according to Paik, into "the main nonmaterial product of post-industrial society."[6]

[4] See "Satellite Art: An interview with Nam June Paik", by Eduardo Kac. http://ert2k.com/ngallery/docs/Essays/kaconpaik.html (accessed on June 21, 2021).
[5] Nam June Paik (1976), *ibid.*, p. 157.
[6] Nam June Paik (1976), *ibid.*, p. 158.

In 1977, a group of artists led by Willoughby Sharp, Liza Bear, Sharon Grace and Carl Loeffler organized *Two Way-Demo*, a live audiovisual satellite television broadcast on the MCTV station, which brought together various artists at two remote locations: New York and San Francisco. In the same year, Kit Galloway and Sherrie Rabinowitz, in collaboration with NASA, presented the *Satellite Arts Project*, the first interactive audiovisual performance between groups of dancers located on the Atlantic and Pacific coasts of the United States, creating a virtual space for a joint performance.[7]

Given the mainly performative feature of satellite art, these first experiments are considered the main precursors of future online audiovisual teleperformances.

TV-ACTIVISM

Counter-culture movements characteristic of the 1970s had an influence both on the production of video art and on the initiatives around a "democratization" of television, mainly through the use of cable television. The American magazine *Radical Software*[8] played an important role in spreading the demand for television decentralization, until then totally dominated by commercial corporate structures. Created in 1970 by the members of the Raindance Corporation group —Beryl Korot, Phyllis Gershuny and Ira Schneider—, the magazine published eleven issues up to 1974, which can be seen today on the Internet.

Another relevant publication at the time was Michael Shambert's book *Guerilla Television* (1971), considered the manifesto of the political movements of American video art. Shambert also created Top Value Television (TVTV), one of the first video collectives to make critical productions in the US.

Independent television actions were developed mainly in the US and in Europe. In 1972, the German group Telewissen, created by Herbert Schuh-

[7] Cf. article by Gene Youngblood, "Electronic Cafe Internacional. El desafío de crear al mismo nivel que destruimos", in: Giannetti, Claudia (Ed.). *Ars Telematica – Telecomunicación, Internet y Ciberespacio*. Barcelona: ACC Angelot, 1998, pp. 28-44.
[8] www.radicalsoftware.org (accessed on June 21, 2021).

macher in 1969, presented its participatory television project at Documenta 5, in Kassel. Using the latest portable video technology with live streaming, the group enabled the participation of people on the street in the programme.

In Spain, one of the first experiences with independent television was *Cadaqués Canal Local*, by Antoni Muntadas, in 1974. A regional channel broadcast a program produced by the artist and his team of collaborators in bars and in the casino in the town of Cadaqués, transforming television into a community and socializing medium.

The MedienOperative Berlin e.V. group was created in 1977 as an independent video production platform, whose themes focused on political and social issues. In the same year, Klaus vom Bruch, Marcel Odenbach and Ulrike Rosenbach created the Alternativ Television ATV group in Cologne, whose proposal was to offer a thematic program, aesthetically different from the official offer. Not being able to broadcast on public television channels, they have illegally retransmitted to neighbors and acquaintances.

A different strategy was carried out by Chris Burden in his series of short television commercials entitled *Chris Burden Promo*. The commercials were aired on TV channels in New York and Los Angeles in 1976, and consisted of a sequence of names statistically considered the best known artists in the US, where he ironically included his own name: "Leonardo da Vinci, Michelangelo, Rembrandt, Vincent van Gogh, Pablo Picasso, Chris Burden". The proposal was presented in Documenta 6 (1977) in Kassel.

Conceptual and activist art became two highly significant trends in upcoming audiovisual projects online, which found prominent sources of reference in these first television demonstrations.

1980s

ART AND NETWORK

The pioneering experiments based on satellite and television transmission favored the development of the participatory telecommunication art, thus preparing the

field for the future development of Internet art, online interactive art and, particularly, the online audiovisual.

After the ARPANET, in the early 1980s, other telematic communication networks emerged, such as Usenet News for UNIX users and, in 1981, BITNET for IBM users. In 1983, the US Department of Defense created its own network and disassociated itself from the ARPANET, which was then solely devoted to academic research under the name ARPA-INTERNET.

In the 1980s cultural sphere, several initiatives already indicated the progressive use of telecommunication networks. There were three commendable projects: *Hole in Space*, a tele-action project by Kit Galloway and Sherrie Rabinowitz, can be considered a precursor of participatory telematic audiovisual installations. A satellite connection connected the two installation sites in Los Angeles and New York. The public could interact with spectators from the other side of the country through an audiovisual system. *Terminal Consciousness*, organized by Roy Ascott, was a computer-assisted teleconferencing project, which used Infomedia's Planet network to connect Ascott, who was in England, with Keith Arnatt (Wales), Eleanor Antin (La Jolla, California), Don Burgy (East Minton, Massachusetts), Douglas Davis (New York), Douglas Heubler (Newhall, California) and Jim Pomeroy (San Francisco). The ARTEX mailbox electronic network (Artist's Electronic Exchange Network) consisted in a revolutionary exchange program, which was used by approximately 35 artists in different parts of the world. This community organized several remote collaborative events and operated until 1991.

Only eleven years had passed since the creation of the first telematics network —ARPANET— which linked four North American universities, and it was exactly a decade before the birth of the World Wide Web, which would allow access to the telematics network on a global scale.

TELECOLLABORATIVE ART

The idea of promoting collaborative art through the use of telecommunications experienced a significant expansion throughout the 1980s. At the Ars Electronica Festival in Linz, in 1982, Robert Adrian X presented the project

The World in 24 Hours; artists from 16 cities around the world sent their artistic proposals for a whole day using low-tech systems such as telephone, fax, radio or slow-scan-television.

On *Good Morning Mr. Orwell*, organized in 1984 by the Centre Pompidou in Paris and the WNET-TV network in New York, Nam June Paik organized a transmission of teleperformances via satellite, which were both simultaneous and participatory. According to Paik, this audiovisual event was "the first global interactive use of Satellite among international artists". About fifty artists from all over the world met in the same virtual television "space", and performed live successively or even simultaneously (via split-screen). Among them were Joseph Beuys, Robert Combas, Yves Montand, Ben Vautier, Laurie Anderson, John Cage, Merce Cunningham, Allen Ginsberg, Mauricio Kagel, Charlotte Moorman and Philip Glass.

This teleparticipation model was widely explored in the project *Electronic Cafe International*,[9] also developed in 1984 by Kit Galloway and Sherrie Rabinowitz, in the context of the Olympic Arts Festival in Los Angeles. The artists installed an electronic video and text teletransmission system in five neighborhood cafés, encouraging the public to exchange contributions of their own. The idea was to create "a space anyone could have access to, where they could share their ideas or opinions. A space where people could publicly document their lives or undertake something"[10]. Cultural diversity as a model of integration occurred both in the geographical context and in the context of the virtual space of communication. Kit and Sherrie shared with other artists of that generation their concern with the humanization of audiovisual telecommunication networks and with the promotion of active interrelation among people.

The next step would be the geographical expansion of this intercommunication network. In the 1989 project, Kit and Sherrie distributed videophones

[9] Cf. http://www.ecafe.com/1984.html (accessed on June 21, 2021).
[10] Kit Galloway & Sherrie Rabinowitz, *Overview of a Quarter Century of Pioneering Artistic Achievements 1975–2000*, in: http://www.ecafe.com/index.html (accessed on June 21, 2021).

to different parts of the world, in order to expand this long-distance, live, interactive audiovisual communication network. It was a proposal that anticipated, in fact, what would become the telematic fabric established by the Internet. *Electronic Cafe* created a non-institutional, multicultural and global model of interpersonal audio-visual communication, which promoted the idea of a crossover, non-hierarchical dynamic relationship between individuals or groups. Furthermore, it supported this new vision of the artist as a cultural activist. Open cooperation allowed a redefinition of the artist's social role, a re-socialization of cultural spaces, as well as the possibility of integrating different art forms and disciplines.

Planetary Network and Laboratory Ubiqua is another example of collaborative network development, which included the participation of more than one hundred artists. Organized at the Venice Biennale in 1986, by Robert Adrian X and Roy Ascott, with the participation of Norman T. White, Don Foresta, Tom Sherman, Tomaso Trini and Maria Grazia Mattei, the activities took place over 14 days in 14 cities in Europe, the US, Canada and Australia. Using IP Sharp's ARTEX network, interconnected computers and slow-scan-television, the project became a center for debate on the future of art and the artist in view of new technological resources.

In 1988, Brazilian artist Carlos Fadon Vicente used slow-scan television technology to create *Natureza Morta – ao Vivo* [Still Life – Live]. The work should be understood as part of an interactive process rather than an end product and is a video documentation of a pre-Internet telecommunications event. Pointing to the continuity and fluidity of telematics, *Natureza Morta – ao Vivo* was part of the event titled *Intercities: São Paulo/Pittsburgh*. Aimed at cultural interrelations, this tele-artwork re-addresses a traditional artistic genre —the still life. It performs an interactive, collaborative real-time approach by means of an electronic medium: a slow-scan television system linked to standard telephone lines. Basically, an image (from a still life) created in São Paulo was transmitted to Pittsburgh, where it was then used as a background for a new image (another still life), which was in turn sent back to São Paulo, and so on.[11]

[11] Giannetti, Claudia (ed.). *Something Other Than Photography: Photo & Media*. Oldenburg: Edith-Russ-Haus für Medienkunst, 2013, pp. 52–54.

COMMUNITIES AND MAILBOX

In the mid-1980s, a number of online communities were developed, which used electronic bulletin systems BBS (Bulletin-Board-System, also called mailbox) and a connection via telephone and modem to enhance intercommunication in the field of art.

Despite not being a mailbox specialized in art, *The Well* ("Whole Earth 'Lectronic Link") became one of the best-known newsgroups and brought together independent intellectuals and counterculture advocates. Founded by Stewart Brand and Larry Brilliant in 1985, in California, it was brought to the Internet in 1994. Art Com Electronic Network (ACEN), hosted by The Well, was founded in 1986 by Carl Loeffler and Fred Truck. It was one of the first "virtual gallery" experiments and can be considered one of the precursors of art on the Internet.

In Germany, the BBS-Bionic was one of the most representative mailboxes. Created in 1987 as a community in the context of Bielefelder MailBox AG, it was the most widely used one especially in the Germanic sphere. The first BBS community project dedicated specifically to art was *The Thing*,[12] created by New York-based German artist Wolfgang Staehle. It became operational through a telephone network in 1991, in New York, and after 1992 it expanded to different cities (Cologne, Vienna, etc.), settling on the Internet in 1995.

1990s

INTERACTIVE TV

The fusion between the telecollaborative model and independent television was achieved with *Piazza Virtuale*, a project of the Ponton/Van Gogh TV group developed at Documenta IX (1992) in Kassel. Based in temporary studios in a square in Kassel, it used the German television channel ZDF, two satellites, the telephone network and electronic bulletin systems. Over a hundred days, viewers

[12] https://bbs.thing.net/login.thing (accessed on June 21, 2021).

in the city and its surroundings could watch the Piazza Virtuale channel on their home television sets and interact with the live show using their telephones or via modem. The public was in fact the one who generated the contents of this channel interactively. This project can be considered one of the main precursors of interactive and collaborative audiovisual net art/network, which would be developed in the future on the World Wide Web.

ART AND INTERNET

In 1990, the Internet was introduced as a public communication network with worldwide free access, through the World Wide Web system; it became popular among the general public with the launch of the Mosaic browser (NSCA, 1993) and, later, in 1994, with Netscape Navigator, the first commercial browser, followed by the design of specific programming language (Java) and other browsers freely accessible to users.

With the spread of the www, a greater number of creators began to explore the use of the network to create artistic projects related to the research on the specific language of this medium. Virtual communities gave rise to different groups. From more personal perspectives, artists were interested in the use of the Internet as a medium to generate specific works that embraced the notion of network and the possibility of an open dialogue. These were the the foundations for what would later be known as net art.

Telematic networks and virtual reality made it possible for artists to explore other dimensions of audiovisual ubiquity, such as telepresence. Telematic and telerobotic systems enabled them to create virtual doubles, changing the shape or giving life to different characters. In addition, they allowed the user to teleport their virtual clones, control them remotely and animate them in real time during their cyberperformances. With the possibility of virtual cloning, discussion topics such as personality splitting and the relationship subject-body gained an unusual perspective. Relevant for these manifestations were Stelarc's telematic performances, where technology was used as a means of masking or liberating the subject. In his well-known Internet-connected interfaces such as *Split Body*

(1994) and *Fractal Flesh* (1995), Stelarc used the body as both object and subject. The body became a host for other bodies and remote agents. In his words, "a body that can transfer its conscience and its action to other bodies or fragments of bodies in other places. An alternative operating entity that is spatially distributed, but electronically connected."[13] His proposal consisted in transforming the body not into a place of inscription, but into a medium that allowed remote agents to manifest themselves interactively. This type of action would also change the concept of Internet. According to Stelarc, the Internet could be structured in such a way that it would allow scanning, selecting and establishing the interface with groups of bodies online in real time. The Internet would not only become a transmission medium, but also a "a method for transduction, which would affect the physical action between bodies."[14] Stelarc deduced that the electronic space would become an area of action, rather than one of information.

VIDEO AND INTERNET

After the development of video comprehension systems for the web and the first online video transmission, in 1992, David Blair started his Internet hypertext film project, *Waxweb*, in 1994. Considered the first film made for the Internet, it is a work of reference in terms for online non-linear audiovisual narrative.

In Spain, *Sísif* (1995)[15], by Antoni Abad, was perhaps the first web art work where a brief audiovisual was used; it consisted of two pages, one installed on the website of the MACBA Museum of Contemporary Art of Barcelona, and the other on the website of the Wellington Museum in New Zealand. The double representation of Sisyphus, painfully and endlessly pulling the rope at both ends, alludes to the symbolic (but equally entangled) connections that occur in the virtual space.

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[13] Stelarc. "Visiones parásitas. Experiencias alternantes, íntimas e involuntarias", in: Claudia Giannetti (ed.). *Ars Telematica. Telecomunicación, Internet y Ciberespacio*. Barcelona, L'Angelot, 1998, p. 132.
[14] *Ibid.*
[15] http://www.hangar.org/sisif/indexv.htm (accessed on June21, 2021).

While most of the projects related to audiovisual telematics installations and online teleperformance were conceived specifically for the medium, most videos produced for the Internet continued to use telematic resources as a form of distribution, keeping the linear language characteristic of single-channel works. Some exceptions, such as *Sitio Taxi*, a project by Antoni Abad, and *Being Boring*, by Fran Ilich, researched not only a non-linear dynamic audiovisual narrative, but also innovative ways of interactively involving the user in the narrative creation of the work.

From the beginning of the 21st century, with the development of online streaming media technology, we witnessed a specific trend in the field of online audiovisual creation, whose main characteristic was the use of hypertextual narrative resources which converge both multimedia and participatory features.

Streaming technology made it possible to compress audio and video information —until then the greatest technical obstacle artists had to tackle. This made it possible to listen to and watch the files in a synchronized way while they were being downloaded, speeding up the process and avoiding the long and double procedure used until then that required downloading the entire file into the computer first and only then watch it. The use of streaming servers also enabled the transmission of live audiovisual events and the simultaneous intervention of several users. Innovative projects such as *In Death's Dream Kingdom* (2003) by the video artist Iván Marino, relied on new languages based on participatory audiovisuals. "The work is in constant process, occurring both internally and as a form dependent upon the user. A mechanism of internal attractors keeps the access elements linked into the audio-visual work fragments in the interface; the user, as an external interactor, can reorder these elements and create a new narrative in a temporal context. The video was recorded in institutions that house disable people whose sense of perception is altered. The way that Marino structures audiovisual information into various participative levels and employs the interface, using highly uncommon resources, places this work

among the most important experimental productions using video streaming in an interactive way."[16]

WEB CAM AND OTHER TRENDS

The web cam projects were a particular approach. The first use of a network camera happened in 1991, at the University of Cambridge, where two students connected a surveillance camera to a computer, in order to use the network to monitor what was happening in cafeteria, specifically with the coffee machine. Video surveillance through web cams became one of the strategies that artists exploited the most, such as the performance works of the group Surveillance Camera Players.

Two early web cam art projects set other trends in web cam art use. On the one hand, *The Multicultural Recycler*, by Emy Alexander (1996), which tried to find a way to encourage user participation and study the relationship between the work and media randomness. *GhostWatcher* (1997), by June Houston, on the other hand, resorted to the clear voyeuristic tendency of Internet users, showing the progressive intrusion and violation of private space. In this work, the artist claimed to be threatened by ghosts and installed several live-cams at strategic points in her house —under the bed, in the basement, etc.—, so that users could monitor any suspicious event and notify Houston via email.

This and other works, such as *CCTV A World Wide Watch*, by Heath Bunting, sought to draw attention to the problem of video surveillance systems and the alleged "citizen security" they offered. The user was transformed into a citizen police officer, who watched the city and private spaces through web cameras that captured life on the streets and in people's houses.

At the beginning of the 21st century, another phenomenon came into the spotlight, the so-called vlog or vblog —short for videoblog. In these, the main medium used was digital video. Vlogs were a modest version of the sophisti-

[16] Giannetti, Claudia, "Aesthetic Paradigms of Media Art", in: *Aesthetics of the Digital. Media Art Net*: http://www.medienkunstnetz.de/themes/aesthetics_of_the_digital/aesthetic_paradigms/13/ (accessed on June 21, 2021).

cated and collective idea of Web TV and consisted in homemade or amateur videos or videoposts. Some tended to a form of individual online journalism, others chose to broadcast their own productions or family videos. Those were the precursors YouTube and the different social media platforms that would later come into being.

This text was written in 2004 and revised by the author in 2021.

FUTURE CINEMA[1]

Jeffrey Shaw

The history of cinema is a history of technological experiment, of spectator-spectacle relations, and of production, distribution and presentation mechanisms that yoke the cinema to economic, political, social and ideological conditions. Above all, it is a history of creative exploration into the uniquely variegated expressive capabilities of this remarkable contemporary medium. Despite cinema's heritage of technological and creative diversity, it is Hollywood that has come to define its dominant forms of production and distribution, its technological apparatus and narrative forms. But the hegemony of Hollywood's movie-making modalities is increasingly being challenged by the radical new potentialities of the digital media technologies, as evidenced by the rapid rise of the video game, the location-based entertainment industries, and new artistic practices. The new digital modalities for the production and presentation of cinematic content are setting up highly appropriate platforms for the further evolution of the traditions of independent, experimental and expanded cinema. This

[1] This essay was originally published in the exhibition catalog *Future Cinema – The Cinematic Imaginary after Film*; eds. Jeffrey Shaw and Peter Weibel, ZKM, Karlsruhe (2003), pp 19-27. It has been lightly edited and revised by the author in collaboration with Richard Allen. My thanks to Richard for his guidance and advice.

digital domain is above all distinguished by its broad range of new interaction methodologies. While many traditional forms of expression are also interactive to the extent that they must be interpreted and reconstructed in the process of apprehension, digital interactivity offers a new, immediate dimension of user control and involvement in the creative proceedings. As the growing spectrum of input-output technologies and algorithmic production techniques are applied in the creation of the digitally expanded cinema, this is a means whereby traditional cinema's compulsive spectator-spectacle relationship can be transformed.

The Chilean filmmaker Raul Ruiz has criticized the compulsive attributes of the central conflict theory in the Hollywood cinema and calls for strategies whereby the autocracy of the director and his subjugating optical apparatus can be shifted towards the notion of a cinema located in the personally discoverable periphery. How exactly to achieve this is one of the challenges Future Cinema poses, but it is undoubtedly the case that a new poetics of narrative is being afforded by the new imaging/representation technologies. The central research task then is the conception and design of narrative techniques that allow the interactive and emergent features of that medium to be satisfyingly embodied. Going beyond the triteness of branching plot options and video-game mazes, one approach is to develop modular structures of narrative content that permit indeterminate yet meaningful numbers of permutations. Another approach involves the algorithmic design of content characterizations that would permit the automatic generation of narrative sequences that the user could modulate, for instance by using a genetic model of selection. And perhaps the consummate venture is the notion of a digitally extended cinema actually inhabited by its audience, who then become agents of, and protagonists in, its narrative development. Here we are less concerned with established threads of cinema-theory discourse than with opening up for consideration the broader nature of the cinematic experience as a heterogeneous and renewable modality of artistic expression and public encounter, and to create an appreciation of the radical impact that the increasing shift to digital techniques of production and presentation is having on the nature of the cinematic experience. Such an

appreciation is often best achieved by a closer examination of the nature of the traditional, and even obsolete, means of production and presentation that have constituted cinema up to now. In this way we see more clearly the differences that the digital is offering, differences that more often than not are just other ways of going about achieving analogous artistic objectives, but with a different set of technical constraints and, consequently, of formal strategies. In the same sense, we can also include certain aspects of literature, painting, music, architecture and theatre as parents of this undertaking, while the frustrations expressed by filmmakers with traditional cinematic forms expose deficiencies that the digital may, in often unexpected ways, be able to resolve.

This essay sets out to identify a number of underlying strategies, by means of a set of keywords —concepts, for the practices of todays and tomorrow's Future Cinema:

Remapping in cinema makes direct use of the actual filmic products of our cinematic heritage, taking these extant materials as the means to generate various forms of critical reflection upon the nature of the cinematic experience. This remapping process can be applied to the original material in various ways, for example by means of formal, temporal and/or spatial reconfigurations of the original data, or through re-framings of its narrative and ideological components. While within cinema history (and, more paradigmatically, within music composition) there is an established tradition of referencing and recycling past examples.

Transcriptive cinema covers the broad range of current experimentation that is challenging traditional notions of cinematic narrative. One enabler of this move towards more open narrative structures is the fact that in a museum or gallery the cinematic installation can be given temporal and environmental definitions wholly different from those which are obligatory (the norm) in traditional cinema-theatre presentation. This opens the way for multiple screenings, multiple layering of narrative and, in the case of interactive works, the creation of navigable multi-branching narratives. The presence of computing techniques in these works may be more or less evident, ranging from simply the exactly synchronized playback of two or more

video streams to an explicit interactive environment in which the viewer is engaged the manipulation of a programmed set of narrative options.

Re-combinatory cinema is an extension of the transcriptive; its practitioners recognize the emergent narrative potentials of an interactively accessible database of audio-visual materials. Whereas transcriptive narratives are concerned with the re-assembly of defined sets of narrative paths (as is the case in most video-game scenarios), re-combinatory narratives embrace the idea of an unascertainable complexity of path options, leading to an unforeseeable patterning of narrative conjunctions. At the same time these artworks are not random or chaotic narrative systems; each one has a meta-narrative identity embodied both in its selection of materials and in the underlying algorithms that determine the manifold combinatory permutations. It is here that the unique artistic definition of each work is being articulated.

Figure 1. EAVESDROP (2004). Jeffrey Shaw, David Pledger. A cinematic installation where multiple narratives can be interactively explored in a custom designed 360-degee projected environment. The viewer thereby becomes the film's cameraperson, editor and performance director.

Interactive cinema is offered in many of the transcriptive and re-combinatory film works. Interactive cinema carries with it the navigation function that viewers engage in when exploring their narrative options and behaviours. The NAVIGABLE cinema is one that make the construction of a navigable narrative space their central feature, and in so doing create cinematic formalisms quite distinct from the types of representation we are used to in the cinema. On the most fundamental level, these works challenge the artificial optical properties of the camera lens with its perspectival framing constraints, and instead attempt to constitute an expanded model of representation that models itself on the way that we actually apprehend and inhabit space. By creating virtual extensions of the image space that the viewer must explore in order to discover its narrative subjects, the navigable artwork allows the interactive viewer to assume the role of both cameraperson and editor, operations that in the traditional cinema are determined beforehand.

Interpolated cinema has an interest in conjoining conditions that are carefully separated in traditional cinema. The familiar boundaries between the factual and fictional, the actual and the virtual, are challenged by these "mixed reality" strategies that create paradoxical audio, visual, spatial and temporal interrelationships resulting in unexpected formations. In some works, these take advantage of the ability of digital methods to transpose one source of information and map this onto another data set. For example, spatial information can be merged with temporal coordinates, creating extended modes of representation different from those provided by traditional techniques that align themselves to the perceptual constraints of the human sensory organs.

Immersive visualization is an important denominator of new-media research and practice. The objective, as in many forms of art, is an experience of physical and imaginative relocation that induces a totality of engagement in the aesthetic and dramatic construct of the work. Even via the smallest screens, there is an immersive condition resulting from our virtual dislocation into inhabited information spaces such as the Internet and cyber-games. The conventional cinematic mode of immersion derives from the darkened enclosure of the movie theater, in which it has striven to conjure representational

Figure 2. MOVIE MOVIE (1967). Eventstructure Research Group. An immersive cinematic performance at the 4th. Experimental Film Festival in Knokke-le-Zoute in Belgium, where the projection screen was an interactive pneumatic structure that the audience could jump into.

equivalence with the real. These new works demonstrate various experiments with innovative optical and environmental configurations, as well as drawing on techniques of stereoscopy, virtual reality and interactivity in order to achieve new levels of physical and imaginative assimilation of the viewer within the image space. And contrary to cinema's mere enlargement of the screen, these augmentations of the image space are sought after as a means of achieving semantic extensions of the narrative space.

Algorithmic cinema, to various extents, abandons the use of images captured from the real world and instead offers software-generated formations that may lead to representations that mimic the real world, or may constitute completely synthetic image structures. While the core qualities of these undertakings derive from the algorithmic sophistication of their so-called "software engines", some have a hybrid nature, using real-world data such as motion tracking or texture mapping to inform the design and/or behaviour of their

meta-realisms. And others sidestep the effort of developing custom software by recycling game-engine code as the platform for creating personal narrative formations.

Networked cinema is signalled by the arrival of the Internet together with related low- and high-bandwidth telecommunication technologies has already had enormous impact on the cinematic imaginary. All the specific qualities of this new networked medium —including its economy of individual production, its open distributed modalities of consumption, its ideological freedom and idiosyncratic formal characteristics— has led to the proliferation of what is clearly now one of the main currents driving Future Cinema. The technologies of video games and the Internet point to a cinema of distributed virtual environments that are also social spaces, so that the people present become protagonists in a set of narrative dislocations. The many catchwords in this field of development (multi-user, distributed, mobile, ubiquitous, wearable and so on) are the real technological underpinnings of what will be an increasingly broad range of experimental cinematic undertakings.

Finally, **Screenless cinema** posits technical and theoretic strategies of completely new forms of image-generation and image-reception systems. In one instance, it is the already familiar but so far unrealized promise of holography given a new twist. Others give tentative form to the again familiar but unrealized fantasy of direct image generation into and out of the eyes and brain. And theoretically we begin to conjure for the cinema futures that offer radical new territories of expression and experience by foreseeing technologies and creation modalities of an order very different from those currently being exercised.

The most obvious area of the transformations currently being undergone by the film industry is its shift towards digital methods of recording, storing, projection and distribution. One highly visible component is the proliferation of the usually sensational, sometimes subtle, digital effects that are invading our screens to the fascination of mass audiences around the world, seamlessly integrated into Hollywood's story-telling formulas. The current boom in the video-game industry is likewise synergistically linked to this enormous surge in digital-image gen-

eration and processing technologies whose current pace of evolution surpasses even Moore's Law. On these big and small screens the new media industry is exploring its own agenda of the cinematic imaginary. An overriding feature is its narcissistic fascination with the technological momentum that is underlying its own manner of making, namely self-reflexive products that conjure as their subjects the future of the future (and the future of the past). However, Future Cinema does not have to to locate its discourse in this mainstream territory but instead may seek out all those fringe and often apparently eccentric individual artistic experiments pointing to a more radical and heterogeneous future for the cinema. That is also why we are acutely interested in the early history of the cinema. Hinting at a dynamic diversity of potential cinematic futures, the idiosyncratic individual experiments shown were conducted in an era before the industry instituted its narrative axioms and production/presentation techniques as the overriding, exclusive modality of cinematic experience in what Tom Gunning has termed the "cinema of attractions."[2] An internal affinity between current cinematic research, pre-cinematic experiments can also be seen in the work of many contemporary artists who recycle and/or reformulate earlier techniques as a renewable creative strategy.

At the same time large-scale "location-based entertainment" (LBE) offers a more normative, industrial scale vision of a future "cinema of attractions." Typically, LBEs are theme park and Expo type attractions that range from sophisticated interactive virtual-reality experiences to more prosaic ride films and game-arcade entertainments. DisneyQuest in Orlando, for example, demonstrates the first mass public implementation of VR technologies that were otherwise still at the prototype stage. Like (As) in the case of the cinema, however, we are seeing LBEs become both low and high cultural phenomena, offering a heterogeneity that includes Las Vegas gauche, Rem Koolhaas' Prada stores, as well as the proliferation in museums of new-media attractors signalled by the popular success

[2] Tom Gunning, "The Cinema of Attraction, Early Film, its spectator, and the Avant-Garde," Wide Angle 8 3/4 (1986), pp. 63-70.

both of Exploratorium-type hands-on exhibits and the aesthetic sophistication of current video-installation practice. The LBE may be also understood as a new urban phenomenon —its "E" offering in most cases Entertainment, in some cases Enlightenment— and as such it is a true child of the cinema as cultural phenomenon. LBEs are also the test beds for some of the most interesting technological extensions of the cinematic experience, offering for example panoramic and 3-D full-dome projection environments as well as experimental kinaesthetic, synaesthetic and simulatory experiences of various kinds. Their mass popularity signal the development of new forms of places of urban social activity, again echoing the radical social impact once generated by the arrival of the cinema theatre and the ubiquitous social practice of "going to the movies." These large-scale, hi-tech, highly mediated mass social forums are the synergetic counterpart and partner of the parallel smaller-scale media developments in the domestic sphere as well as the micro scale of portable media devices. In the realm of the digital, the essential scalability and networkability of its codes allows the cinematic imaginary to be seamlessly distributed amongst these various forms, opening dizzying perspectives of creative interpolation on all levels and in all places.

The creative evolutions and transformations of the cinematic imaginary cannot be separated from the nature of the technologies that give it these opportunities. It is therefore completely understandable that throughout cinema history, and especially today, so much effort is dedicated to the creation of new technological resources as a means of enabling new modalities of expression and experience. This is testified to by the cross-disciplinary genius of modern cinematic artists whose works conjoin technological and aesthetic dexterity in an inseparable and interdependent whole. Yet, this interdependence of creative and technological advances causes some difficulties. For most people (including most cultural commentators) the technologies involved are esoteric, often incomprehensible, and the methods of production are hidden from view. This makes it problematic to decipher and describe the specific creative formulations that the artist has made, as distinct from (and in relation to) the formulations embedded in the technologies that have been used. On the other hand, technologies like the

Internet and DVD have become so generic and ubiquitous that technological anxiety has pretty much disappeared in some fields of practice. For example, with the arrival of DVD players and digital projectors, all those old frustrations with damaged tapes, unreliable synchronization of multiple players and high maintenance projection have been resolved, so that the easily serviced video installation has at last made a triumphant entry into the mainstream of museums and galleries. In the same manner, the ubiquitous proliferation of networked video-game computers as a household appliance is laying the ground for the imminent arrival of the cinematic imaginary in everyone's home, while the mobile phone is setting a nomadic stage for the acceptance of distributed cinematic experiences.

Cinematic practice is predicated on a co-dependent relationship between the potentialities and constraints of its production/presentation machineries, and the filmmaker's desire to bring about specific embodiments of content. Cinematic practice in the twentieth century was forced to struggle with industrially designed, and highly predetermined, machineries. Vilém Flusser understood that it was therefore necessary to "show contempt for the camera and its creations," and that creative freedom equals "playing against the camera."[3] This approach underlies the achievements of last century's experimental filmmakers. The digital machineries of the twenty-first century, while still very much determined by industrial agendas, are inherently more malleable and more open to reformulation at program level by the cinematographer. The latter can move beyond a strategy of "playing against the apparatus" towards procedures of actually transforming the apparatus, so that it can be made to embody idiosyncratic creative programs right down to the machine level. Raul Ruiz foresaw this new situation when he announced his central conviction that "in the cinema… it is the type of image produced that determines the narrative, not the reverse. No one will miss the implication that the system

[3] Vilém Flusser, *Towards a Philosophy of Photography*, London: Reaktion Books, 1983, p. 80.

of film production, invention and realization must be radically modified. It also means that a new kind of cinema, and a new poetics of cinema are still possible."[4]

A full appreciation of any artwork includes an understanding of the extent to which it is a product and reflection of the technologies used in its making. At the same time the history of cultural production also shows us that the aesthetic arguments of an artwork are not necessarily subject to the short-term obsolescence of its manufacturing technology. Some technological developments/mutations themselves maintain the durability of established modes of representation, such as the perspectival congruity between the camera lens and the methods of Renaissance artists. And many current media visualization techniques are the progeny of traditional research into trompe l'oeil, anamorphoses, and immersive formations. On the cultural level, the spectacular but in fact often slight changes engendered by new media are clearly anchored in long-term discursive continuities and desires.

Future Cinema announces and celebrates the immanent and increasing multiplicity of techniques of representation and intercommunication and the emergent expressive possibilities that derive from their invention and application, as well as the individual and social dynamics of these resulting new forms of experience. In the surmounting of the cinema's traditional constraints and the espousal of new media's new constraints, its practitioners are unearthing a profound and manifold territory of cultural renewal in accordance with Luigi Pirandello's standpoint that it is "compulsory to consider the cinema as an artistic problem endlessly in the process of being resolved, and not to trust ready solutions that in most occasions can only help those who found them and only for a brief span of time."[5]

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[4] Raul Ruiz, *Poetics of Cinema*; Editions Dis Voir, Paris, 1995, p.8.

[5] Luigi Pirandello, "Per Il film italiano, Intervista con Pirandello,' *La Stampa* (9 Decemeber 1932), quoted and translated in Manuela Gieri, *Contemporary Italian Filmmaking: Strategies of Subversion* (Toronto: University of Toronto Press, 1995), p.32.

COLLOIDAL SUSPENSION: IMMERSION AND THE PEDAGOGIES OF MAKING

Peter Lunenfeld

THE MOMENT

Immersive media is having another of its big moments. While media archeology traces immersion all the way back to late 18th and 19th century panoramas and up through the multi-mediated experimentation of the 1960s by figures like Morton Heilig and his arcade-like Sensorama, immersive media's last big impact came in the 1980s and '90s.[1]

The hype came from computer generated systems developed at NASA's Ames Research Institute and deployed by artists and 'techno-prophets' like Brenda Laurel and Jaron Lanier, academic research environments like the CAVE —a room-sized environment launched at the University of Illinois, Chicago, and commercial products from gaming giants like Sega and Nintendo. This was a heady time when the talk was of shedding bodies in virtuality as easily

[1] For an introduction to the topic, see Erkki Huhtamo and Jussi Parikka, eds. *Media Archaeology Approaches, Applications, and Implications* (Berkeley and Los Angeles: UC Press, 2011); for VR's links to early media, see Erkki Huhtamo, *Illusions in Motion: Media Archaeology of the Moving Panorama and Related Spectacles* (Cambridge, MA: MIT Press, 2013; and for examples of turn of the millennium thought on immersion see Peter Lunenfeld, *Snap to Grid: A User's Guide to Digital Arts, Media, and Cultures* (Cambridge: MIT Press, 2000).

Figure 1. (i) Robert Barker, Cross-section of his 1789 Panorama. **(ii) (iii)** Morton Heilig's Sensorama.

as shedding identities in anonymous chat rooms, when, for some reason never quite explained, people would speak longingly of adopting lobsters as avatars.[2] And then: Poof! It all went away. The predictions did not pan out. The markets did not materialize. The motion jitter caused too much nausea.

Figure 2. (i) Jaron Lanier in VR goggles, 1989. **(ii)** NASA Ames VR PR, 1990.

Yet two decades later, VR is back, along with its cousins, AR (for augmented reality, blending virtual and real spaces) and XR (sometimes pronounced "cross" reality, with x as an infinitely extensible —and hype-able— variable). Computational technologies continue to shrink in size as they grow in power, and new peripherals, like the Oculus Rift [https://www.oculus.com/] released in 2010, made V/A/X/R available on more platforms and more places. In addition, because of the smart phone explosion, generations of users were now accustomed

[2] See Andrea Stevenson Won, Jeremy Bailenson, Jimmy Lee, Jaron Lanier, "Homuncular Flexibility in Virtual Reality," *Journal of Computer-Mediated Communication*, Volume 20, Issue 3, 1 May 2015, Pages 241-259. https://doi.org/10.1111/jcc4.12107.

to virtual information richness in multiple environments, and hardcore and casual gamers sought out ever more "realistic" computer-generated experiences.

Figure 3. Oculus Rift Packaging, 2016.

THINKING IMMERSIVELY

Yet, for all this growth within the culture at large, neither the theory nor the pedagogy of virtuality has really kept up with its reemergence in the 21st century. The grand claims for post-identity virtual existence seem the least applicable of constructs to build new thinking around emergent systems. Classrooms, if they can keep up at all, seem simply interested in cranking out as many skilled 3D modelers, Unity video game engine jockeys, and engineers with programming skills applicable to these industries as possible. There is little in the way of truly 21st century innovative thinking about immersion, and even less critical design pedagogy in these areas.

These lacuna were part of the reason I was interested in participating in a workshop on immersion at the Radcliffe Institute for Advanced Study at Harvard University [https://projects.iq.harvard.edu/immersion].[3] I had been part of theorizing virtuality the last time around and wondered what emergent thinking there might be on the technology and its cultural implications. My contribution to the workshop included four short notes, one of which merits inclusion here:

[3] Many thanks to the Radcliffe workshop leaders: Peter Galison, Joseph Pellegrino University Professor, Harvard University; Julie Mallozzi, Lecturer, Visual and Environmental Studies, and Administrative Director, Harvard Film Study Center; and Julia Yezbick, Executive Director, Sensate Journal.

> As Walter Benjamin said eighty years ago regarding the suspension of disbelief engendered by the cinema in its sense of immersion: "the equipment-free aspect of reality here has become the height of artifice." As VR and AR immersive environments are attempting to create their own version of "the equipment-free aspect of reality"[4] —which is to say recreating cinema's seamless suturing of the "spectator," but now dimensionalized around the figure of the "user"— do we need to reconsider techniques of de-familiarization and alienation from the 20th century and then deploy them in the 21st century?

After the workshop, I decided to see if these ideas about how immersion is now playing out in contemporary culture might spark interesting interventions with my students in the Design Media Arts department at UCLA [http://dma.ucla.edu/]. At UCLA, I teach seminars and lead smaller studios with graduate students, but offer large lecture classes to undergraduates, and in the Spring of 2019, my *Design Futures* class was somewhere in the middle, with 50 students. With the help of teaching/studio assistant, Miles Peyton, I determined on a hybrid strategy: running it as part lecture, part seminar, and part studio [http://classes.dma.ucla.edu/Spring19/104/]. Just as I have always striven to imbue my undergraduate lecture courses with the sensibility-building focus of graduate seminars, so too here, I wanted to see if the making-centricity of the studio could scale in a class of this size. This report on the class features hybrid voices, braiding perspectives from me and my teaching/studio assistant, comments by visiting artists and designers, selections from theoretical and critical texts assigned—including responses to the class's questions by some of the authors—and, unsurprisingly, a multiplicity of student voices, expressed in

[4] Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," in *Illuminations*, Hannah Arendt, ed., Harry Zohn, trans. (New York: Schocken Books, 1986), p. 233.

discussions, as on-line responses, during interactions with guests, and in texts they crafted for their own final projects.

One aspect of the Radcliffe Institute workshop that I had not expected was the amount of time we devoted to analyzing the viable commercial augmented reality technologies that had emerged over the past decade. The workshop brought specific attention to the platform offered by Florida-based company Magic Leap [https://www.magicleap.com/], with participants discussing both the accomplishments and the hype that was driving this particular company. By early 2019, med-tech entrepreneur Rony Abovitz had accessed billions in venture capital for his mixed/augmented reality start-up (MR/AR), which featured both a new computer operating system and proprietary hardware. The totality of Magic Leap's vision is expressed in a diagram that kept coming up in the workshop discussions, a portrait of society with two "base" layers —the physical world and the digital world— and five of what are termed "social application" layers: mobility, energy & water, health & wellness, communications, and entertainment.

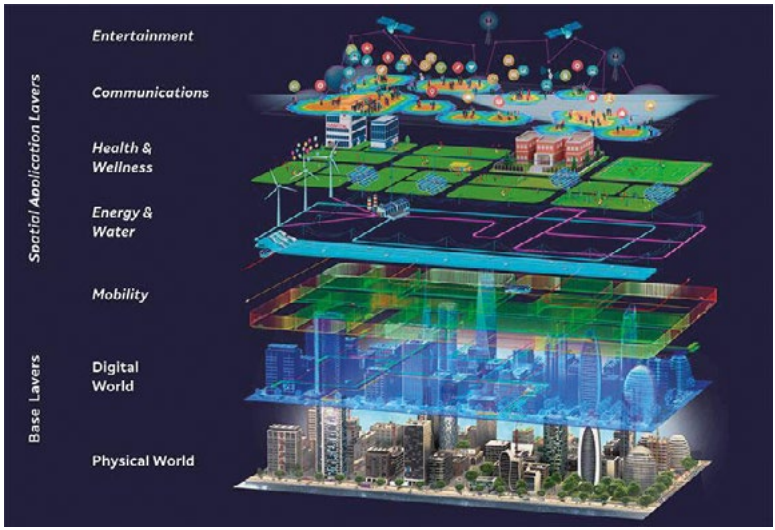

Figure 4. Magic Leap Stack Diagram.

The visual rhetoric of complete integration between these layers via a proprietary software/hardware package seemed to speak of both a technological overreach and a dystopianism that was almost comic in its lack of self-awareness.

Magic Leaps' diagram was tailor-made to demonstrate how Jeremy Bentham's 19th century panopticon and Gilles Deleuze's 20th century society of control were going to be melded and superseded by 21st century immersive tech. While Benjamin Bratton has recently proposed the idea of the "stack" as a way to discuss the emergence of planetary-scale computation as an "accidental megastructure," the deliberate organization of the Magic Leap paradigm implies a 21st century mechanism of control and order, arranged around the complete integration of augmentation and immersion into all aspects of daily life, commercial and personal (including entertainment, of course). Or, to follow another multi-century progression, Karl Marx's alienation of labor within capital gives way to Guy Debord's alienation of lived experience within the spectacle, which in turn may foreshadow the alienation of interaction within all realms from plumbing to dreaming.[5] These aspects of the contemporary profile of immersive technologies foregrounded at Radcliffe came to strongly influence the class projects at UCLA.

HYBRID PEDAGOGY

To move from a peer's workshop to the hybrid lecture/seminar/studio for undergraduates required a grounding in experience. We were lucky to have the class overlap with a pop-up retail store by Rem D. Koolhaas's *United Nude* [https://www.unitednude.com/] that featured an augmented retail environment designed by Floatland's Kate Parsons and Ben Vance [https://float.land/] created and

[5] For the theoretical grounding of these ideas, see: Michel Foucault, *Discipline and Punish: The Birth of the Prison*, Alan Sheridan, trans. (New York: Random House, 1977) which foregrounded Bentham's panopticon for two generations of media theorists; Gilles Deleuze, "Postscript on the Societies of Control," *October*, Vol. 59. (Winter, 1992), pp. 3-7; Benjamin Bratton, *The Stack: On Software and Sovereignty* (Cambridge, MA: MIT Press, 2016); and Guy Debord, *Society of the Spectacle*, Donald Nicholson-Smith, trans. (Cambridge, MA: The MIT Press, 1994).

run on the Magic Leap platform.[6] With that bit of serendipity, the idea for this iteration of *Design Futures* began to solidify. We would build a theoretical base around readings in critical design, media philosophy, and high-tech culture work, do a site visit to the *United Nude* pop-up, and talk with both Koolhaas and the Floatland team.

We broke the students into teams and tasked them with creating commentary, critique, and projects at the intersection between immersion, high-tech hype cycles, and the entrepreneurial. What follows is a detailed description of the pedagogical methods, materials, and selected outcomes of the design research and projects that resulted. These range from an artfully rendered virtual recreation of the retail space to a simple line drawing animation, from virtual jewelry to a posthumanist manifesto for the nonconforming.

Figure 5. (i) Magic Leap Promotional Material. **(ii)** United Nude Century City Pop-Up Store.

CONTEXTUALIZING THE AUGMENTED

Teaching a class of undergraduate design students is always a balancing act, as designers tend to share with engineers a preference for making over theorizing. Using the work of designers who are themselves generating both texts and projects can be particularly effective. Anthony Dunne and Fiona Raby, two pioneers of critical design first at the Royal College of Art and now at Parsons, with their book

[6] Rem D. Koolhaas is the nephew of the architect Rem Koolhaas, Kate Parsons is a recent alum of UCLA's Design Media Arts MFA program.

Speculative Everything: Design, Fiction, and Social Dreaming offer a catalogue of strategies for 21st century designers wanting to dig deeper into both the materiality of design and its social implications [http://dunneandraby.co.uk/content/books/690/0]. Dunne and Raby and their students were central to MOMA's epochal *Design and the Elastic Mind* show [https://www.moma.org/interactives/exhibitions/2008/elasticmind/] in 2008, curated by Paola Antonelli. Like the copiously illustrated Dunne & Raby book, the show's comprehensive interactive website offered models and provocations for the students' own projects later in the quarter.

Figure 6. Dunne & Raby, *Technological Dreams Series: No.1, Robots*, 2007 (installation view).

Theory and practice are the Scylla and Charybdis of the pedagogy of creative practice, navigating between them is the hard part. One strategy the class pursued was to invite in authors and designers with whom I had worked in the early 2000s for my Mediawork Pamphlet series, published by the MIT Press [https://mitpress.mit.edu/sites/default/files/titles/content/mediawork/index.htm].

Brenda Laurel's *Utopian Entrepreneur*, designed by Denise Gonzales Crisp is one of the few self-reflective failure analyses in the literature of high-tech writing on start-up companies (Laurel founded the game company Purple Moon, and she was also a key player in the first VR boom).

Figure 7. Brenda Laurel and Purple Moon Action Figures.

We also read *The Amsterdam Design Manifesto* by Geert Lovink and Mieke Gerritzen which offers a European critique of what they term "self-design." Laurel, Lovink and Gerritzen all volunteered to take questions via email from the students, as for example in this exchange:

> UCLA student Skye Qian: At the end of the manifesto, you write: "the self-designer is critical and inquisitive…[and] experiments with future expectations… for the sake of fellow humans —and humanity as a whole." Given that you are characterizing self-design mainly as an exploitative cycle driven by turning individual insecurities into opportunities

for economic profit, is there really a way to practice this form of design responsibly and pragmatically? What are some examples that you think does this well?

Mieke Gerritzen & Geert Lovink: Let us distinguish diagnosis, critique and alternatives here--in the Dutch sense of radical pragmatism. I stick to the self-design diagnosis here. Critique is very European ;) Let's hope you in California will start to work on alternatives (it is never too late!). The tendency of design moving towards the interior world already has a long history going back to the 'hippie' 1960s. However, it is only now that we can bring all these different tendencies together, mainly thanks to the Babylonian confusion about the meaning of the word 'design' itself. Corporations have deep knowledge about the multi-layered aspects of design. For them these are not contradictory (much more than individual professionals or scholars that tend [to] work in specialized fields). This explains why we are so far behind with this and label 'self-design' primarily as an extractive parasitic strategy of monopoly platforms. However, the self-help industry, that Mieke is covering in her 'self-design' research is a much larger topic. Becoming aware of these larger tendencies as a design is key. The world is so divided in segments such as app design, product design, industrial design, fashion etc. This often makes it hard if you work with clients to raise the larger questions. What is proposed here is not a 'form of design' but a radical approach in the way we work, no matter in what context. What examples would we think of? Sustainability issues? Social inequality? Creating new ways to work together instead of everyone on his or her own?

Figure 8. (i) Mieke Gerritzen. **(ii)** From The Amsterdam Design Manifest.

Self-design resonated with the students because part of what they were wrestling was a struggle to balance the economic imperatives driving the new wave of 21st century immersive technology against their own "immersion" in the worlds of social media, which they experience as both ubiquitous and draining. The production and reflection of self in social media regularly felt "sad by design," to quote the title of another of Lovink's books and the emerging AR/VR companies seemed equally intent to exploit the worst aspects of attention-capturing algorithms.[7] Student Kianna Abad's virtual jewelry is on one level an implementable, commercial project for self-design, creating adornments that exist only in the world of what sociologist Nathan Jurgenson refers to as 21st century "social photography."[8] In their critical design project, "Lucy," students Christopher Ruiz, Skye Qian, Bryant Rahadian and Natasha Puthukud chose to explicitly critique the notion of the designed and designer self from a psycho-pharmacological perspective.

Media designer and researcher Anne Burdick provided another model of research and practice to the students when she presented her near future "design fiction," titled *Trina*.[9]

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[7] Geert Lovink, *Sad By Design: On Platform Nihilism* (London: Pluto Press, 2019).
[8] Nathan Jurgenson, *The Social Photo: On Photography and Social Media* (London and New York: Verso, 2019).
[9] Burdick was a contributor to and designer of *Digital_Humanities*, which she, I, Johanna Drucker and Todd Presner—two colleagues from UCLA—and Jeffrey

Figure 9. (i) Interface Design from Anne Burdick's *Trina*. **(ii)** Scenario Building from Anne Burdick's *Trina*.

Burdick has been developing *Trina* as part of "Micro Mega Meta" [micromegameta.net] which she describes as "a design-driven inquiry into the future of humanities research and scholarly production. Through the creation of speculative environments and interfaces, the project aims to provide a critical alternative to the information technologies envisioned through popular media and corporate promotions that tend to emphasize military, scientific, and business applications." *Trina* is a "design fiction for the digital humanities" —a live performance reading + slide show + electronic sound accompaniment (think PechaKucha meets *La Jetée*) intended "to question the socio-technical systems of emerging technologies for reading and writing." Trina offered an example of how to go about turning design research into design practice, and in this way provided another model to the students. Pengyan Wu, a student who made a functional augmented reality app that could read logos and add dimensional and time-based media drew influence from Burdick's speculative designs. Another group project by students Anastasia D. Lewis, Danielle Kim, Liu Chang, Julie Kim and Wonho Lee offered a research-driven approach that embodied digital humanities practices.

Schnapp—from Harvard—co-wrote and published with the MIT Press [https://mitpress.mit.edu/books/digitalhumanities].

THE SUBJECT

As noted earlier, we used the *United Nude* pop-up featuring an AR installation as the subject of our investigations. United Nude operates, in its own words, "at the intersection of architecture and fashion" and is known for collaborations with figures as diverse as Lady Gaga, Zaha Hadid, Issey Miyake, and Iris Van Herpen.[10] Koolhaas, the lead designer and founder, is perhaps best known for the line's signature Mobius shoe with a "single band uniting the upper, the sole, the footbed and the heel into one infinite piece." He and his team have also done other projects outside of fashion, including the Lo Res car, which is part of the brand's Lo Res Project:

> The Lo Res design method is based on the principle of re-designing the same object in a series, each time lowering the 3D resolution, resulting in a more fragmented and abstract design each step of the way. The Lo Res car shape came from lowering the 3D resolution of the iconic Lamborghini Countach, a Marcello Gandini (at Bertone) design from the early seventies. The Lo Res car is a conceptual design experiment, rather than a conventional car. Its abstract appearance makes it look like a moving sculpture.[11]

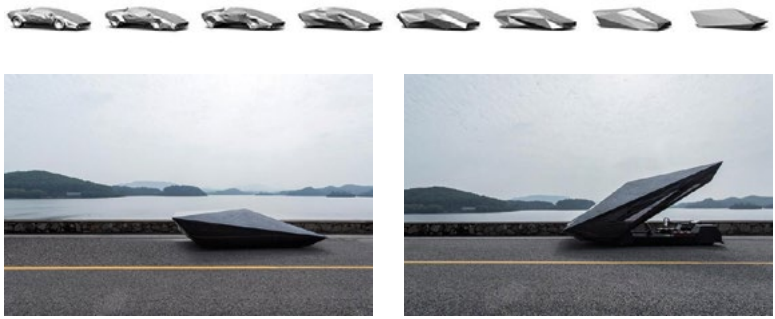

Figure 10. United Nude's Lo Res Car.

[10] https://www.unitednude.com/blog-page/re-inventing-shoes/, accessed June 10, 2019.
[11] https://www.unitednude.com/news-page/Lo-Res-Car/, accessed June 10, 2019.

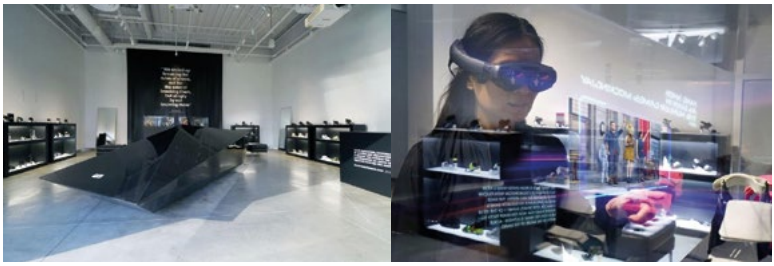

Figure 11. (i) United Nude Pop-Up Store featuring the Lo Res Car. **(ii)** Floatland's AR Experience.

The pop-up offered a variety of serendipities beyond being able to do a bit of actual design ethnography off-campus. First, a brick-and-mortar storefront with embedded immersive components made for a test case of mixed realities as they will come to exist in the future of retail, a key sector for any designer to consider. Second, United Nude is known for more than commercial design, as evidenced by the Lo Res car, which exemplified the kind of critical design object the students had already encountered in their readings in Dunne & Raby's *Speculative Everything*. One student group, Gustavo Tepetla, Hana Tyszka, Natalie Tsang, Ariana Wang and Elsie Wang, made their own, small scale model of a Lo Res car, but with a very different demographic in mind than that offered by the Lamborghini Countach.

Finally, the pop-up was itself embedded in a rapidly changing and challenged environment, including battling Microsoft and Apple megastores, an Amazon "bookstore," and directly next to it, a Tesla showroom with an embedded "virtual design studio." Less evident, but still important, is Century City's own place in the history of public deployment of immersive, tele-present technologies. In 1980, electronic artists Kit Galloway and Sherrie Rabinowitz installed the seminal "Hole-In-Space" project at the mall's now defunct Broadway department store and at Lincoln Center in New York City. Unannounced and unbranded, what passers-by encountered were, in the words of the artists, "head-to-toe, life-sized, television images of the people on the opposite coast." Users "could now see, hear, and speak with each other as if encountering each other on the same

sidewalk. No signs, sponsor logos, or credits were posted —no explanation at all was offered."[12] While the Westfield Group, which runs Century City and holds one of the largest portfolios of commercial property in the world, may not know what to do with this kind of history, the students understood that they were in a space that has been melding commerce, technology, and immersion for decades.

THE VISIT

For the site visit, the students were instructed to bring cameras, sketch pads, sound recorders, post-it notes, pens, pencils, and the like to capture their impressions and have raw material for later work. They broke down into smaller groups with different foci. The Orange Group concentrated on the United Nude space, doing research on the company, its speculative designs, Rem D. Koolhaas, and the concept of the pop-up. The Yellow Group analyzed AR in general, the use of AR technology in the United Nude space, the aesthetic choices, and sensibilities of FLOAT, and how they mesh with the design and branding of United Nude. The Green Group investigated Magic Leap: how was it positioned as a start-up, the pre-visualizations they developed before they released products, where its venture funding came from, and where it fit in the "hype cycle" from which it has benefitted. The Blue Group compared United Nude's pop-up and the use of AR technology to other technology-heavy retail outlets at Century City sponsored by Tesla, Apple, Microsoft, Amazon, and even the video streaming-enabled exercise bike, Peloton.

In a report on the visit, student Lauren Cramer described the experience:

> To begin the simulation, I placed the Magic Leap One headset over my head, and the handheld remote which activated the AR jolted awake by expelling a single loud note. Then, a text box with user instructions appears before my field of vision, white words following every slight movement of my head. Once the AR interior

[12] http://www.ecafe.com/getty/HIS/.

was in motion, abstract, 3D geometric shapes beckoning the user to take a closer look appeared throughout the showroom. At each "checkpoint" denoted by these shapes, more text boxes appeared upon closer contact, describing the United Nude products on display in the area. Some images accompanied these descriptions as well, but for the most part, the Magic Leap technology served as an interactive documentation of the work in the space, elevating the user's shopping experience, while also freeing up space in the showroom where this information would otherwise have been placed. The AR also transformed the space from a design environment to an art one, challenging the status quo of a consumer space should look like. Overall, I believe the AR enhanced the visual context of the space and provided an educational approach to the environment. This was perhaps the aspect that stood out the most to me and had the most potential to build off.

Figure 12. Floatland AR.

THE PROJECTS

Upon developing the design research and moving into producing designed results, certain presuppositions broke down. First, a hybrid seminar/studio with this many students ended up being driven by their interests to a greater extent than any of the external prompts or research parameters of the class. A graduate student who assisted with the class wrote the following:

> At the time of the class, Magic Leap had released its product to the public, but there was a period during which the company trafficked in vaporware. In 2015, Magic Leap released a video with the description "this is a game we're playing around the office right now." The footage appeared to show a first-person shooter game played on the mixed reality headset. In fact, the video was created by the New Zealand based special effects company Weta Workshop, known for their work on the movie Mad Max: Fury Road. The video was not a demonstration of actual Magic Leap Technology, although it arguably presented itself as such.
>
> We saw clear parallels between speculative design and the tendency of technology companies to use design in a deceptive manner to generate hype in the absence of a working product. Given Magic Leap's history of misleading the public, we imagined that students would approach this material with a degree of skepticism. While some students' projects questioned the hype surrounding mixed reality technologies, more were optimistic about the role they would play in areas as diverse as jewelry design and graffiti. These imaginative and optimistic engagements with the technology were great outcomes of the class. Other projects, however, veered into territory that was difficult to distinguish from promotional materials for products. It was our intention for students to use speculative design to critically engage emerging

technologies, and a future iteration of the class might make this point more explicit.[13]

That caveat noted, what the students did produce ranged from speculative design about immersion, to personal responses to this particular techno-social moment, to work that could be the seedbed of commercial pitches —in other words, a representative sample of the strategies and outcomes of contemporary design education. While space does not allow for a discussion of all the projects, the following sample from the class gives a sense of the breadth of opportunities that this kind of hybrid pedagogy may allow for in the future.

Two of the more charming projects were design responses to class itself. Andrew Ortiz' short animation captured the dichotomy between fascination and cooption that immersion engenders.

Dario Apodaca's single web page response was similarly witty, in its deployment of a retro, ASCII art-driven aesthetic.

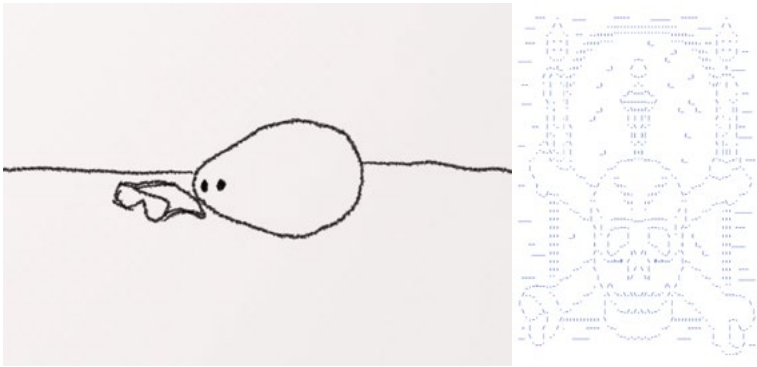

Figure 13. (i) Andrew Ortiz. **(ii)** Dario Apodaca.

As part of their larger investigation into United Nudes' practice, Gustavo Tepetla, Hana Tyszka, Natalie Tsang, Ariana Wang and Elsie Wang created their

[13] Before coming to graduate school, the student had worked in a variety of professional positions that entailed signing NDAs about technologies and companies discussed in this project, so they have chosen not to sign these comments.

own low-resolution car, but did it at Hot Wheels scale, of a contemporary, and much cheaper, American muscle car, the Dodge Challenger, as a way to open up a dialogue about design, price points, and the appeal of virtuality.

Figure 14. Gustavo Tepetla, Hana Tyszka, Natalie Tsang, Ariana Wang and Elsie Wang.

Ellie Park strove "to reproduce the United Nude AR pop-up store that we had experienced, using the virtual reality map provided by United Nude… [doing] a screen recording of the virtual reality store map" and creating the AR on top of it.

Pengyan Wu followed the interest in implementable extended reality by developing a working AR app that could read logos and add dimensional and time-based media. Here Wu takes UCLA's seal and augments it with a three-dimensional model of the campus' iconic Royce Hall.

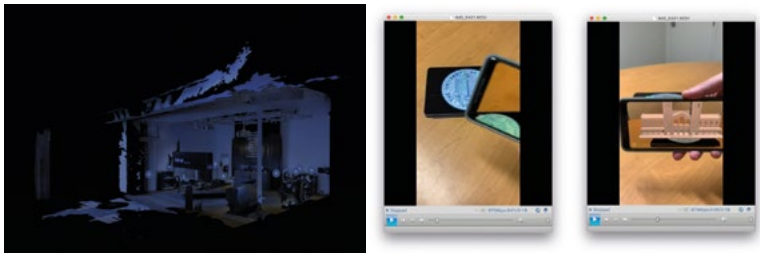

Figure 15. (i) Ellie Park. **(ii) (iii)** Pengyan Wu.

Kianna Abad also looked to engage with 21st century immersion in a commercially viable context, interrogating the "idea of instant gratification—i.e., Amazon Prime [where you] get to see your desires materialize almost instantly. I have been wondering lately if VR/AR would ever be able to contribute to this idea of instant gratification… Can fashion combine with VR/AR and somehow become commodifiable, wearable accessories? Or will VR/AR only make advances in curating/adorning your online self?" Here, she models her virtual jewelry designs, offering one possible answer to that question.

A more ironic take on marketability comes from Christopher Ruiz, Skye Qian, Bryant Rahadian and Natasha Puthukudy, who point out in their project notes that "Magic Leap seems to function almost exclusively in the peak of inflated expectations with regards to the hype cycle." As a counter to this hype, they proposed their own speculative project "Lucy": an interlocking, branded set of drugs and hardware to "feel different… unlocking integrated augmented interactivity that will revolutionize our spatial and interpersonal communication." That Lucy connects to the acronym for LSD produced by the Beatles' psychedelic classic, "Lucy in the Sky with Diamonds" was no coincidence.

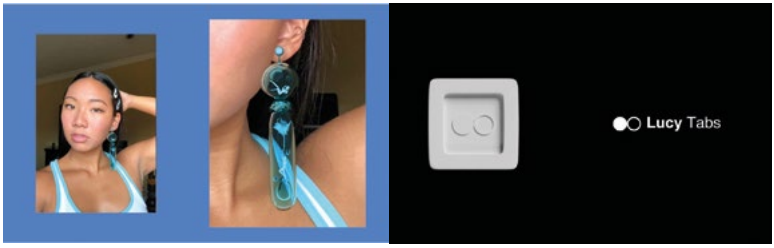

Figure 16. (i) Kiana Abad. **(ii)** Christopher Ruiz, Skye Qian, Bryant Rahadian and Natasha Puthukudy.

Nancy Wu, Joanna Zhang, Stephan Xie and Li Wen Chang created "The Augmented Manifesto" as both a print concept and a motion piece from the point of view of the technologies involved, demanding an end

to anthropomorphization of machines, "when, in nature, that is not their purpose nor form."

Skye Qian, who worked on the "Lucy" project, spent the following summer crafting her own "Technorevolution Manifesto," which riffs off the expanded real as a first step into transhumanism. Like the "The Augmented Manifesto" group, Skye created both print and online versions.

Figure 17. (i) Nancy Wu, Joanna Zhang, Stephan Xie and Li Wen Chang. **(ii)** Skye Qian.

One of the most developed works, in terms of exploring AR/VR/XR, and situating them in their cultural contexts, came from Dillon Bastan and Ivana Damjanovic (who shows her work under the name Ivana Dama).[14] They created an Emotional Reality (ER) speculative tech experiment that arises "from augmented technologies (such as AR) for the purpose of augmenting empathetic inter-human relationships. Using electric muscle stimulation, facial recognition, Max MSP, and Arduino technologies, the two created a system where "one person's facial gestures are imposed onto another's by forcibly contracting facial muscles with electricity. As facial gestures are closely linked to emotional states, ER allows one user to empathize with and perceive the other at a greater capacity."

[14] Bastan and Damjanovic credited the inspiration of Tokyo-based artist Daito Manabe [http://www.daito.ws/en/] in the production of this piece.

Figure 18. Dillon Bastan and Ivana Dama.

Anastasia D. Lewis, Danielle Kim, Liu Chang, Julie Kim and Wonho Lee offered perhaps the most incisive response to the original class brief in a piece simply titled "Design Research Provocation." They created a black and white print piece as well as transparent overlays to "augment" the pages in order to embody their research. On the final page, they summarize, "Without the fantasy, the sci-fi mystique, the tech industry has no ability to fund itself, and therefor prototype itself. Certain products will raise funding after demonstrating a prototype, while others rely on fiction, on hype, on the social dreaming consensus venture capitalists cannot help but throw money at."

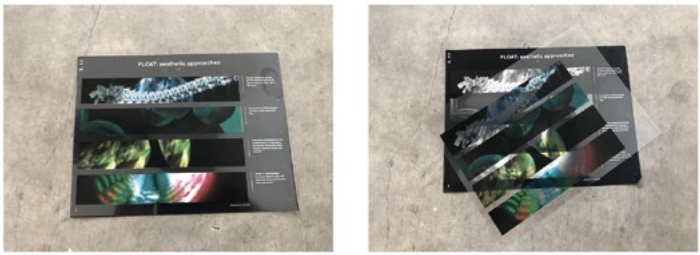

Figure 19. Anastasia D. Lewis, Danielle Kim, Liu Chang, Julie Kim and Wonho Lee.

THE CONCLUSION

The hype around immersion version 2.0, the tragedy of venture-obsessed innovation, even the recent fad of "design thinking" as a curative for literally everything that ails contemporary capitalism, all need investigation and push

back, especially now.[15] While many of the students' projects embodied that youthful enthusiasm for emerging technologies and opening up new spaces for work and even commerce, there was also a lot of serious thought given to the ways in which this second wave of immersion was being positioned to become ubiquitous. The era of immersion 2.0 has been about not only building technological, commercial, and social infrastructures, but also rendering them habitual and eventually invisible.[16]

But as information studies pioneer Susan Leigh Star noted famously, the "normally invisible quality of working infrastructure becomes visible when it breaks," and the pandemic of 2020, and the global economic shutdown that followed, is the greatest breakdown in over a hundred years.[17] Neither I nor the students of *Design Futures* in the spring of 2019 had any idea that within less than a year, so many of our infrastructures would be made nakedly visible, our uses of technologies of immersion habituated in new and sometimes perverse ways, and that their design research and interventions would, a year later, seem not so much prescient as teleological.

The *Design Futures* class of the spring of 2020 is not dealing with pop-up commerce, because we're only buying necessities. We are not doing design ethnographies in Century City, because in this century, the city of Los Angeles has shut down every mall, technologically augmented or not. The students, teaching assistants, and I are still meeting and talking with visitors, but remotely, via business communication

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[15] A foundational text of design thinking is Tom Kelley with Jonathan Littman, *The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm* (New York: Currency, 2001). To see the spread of design thinking from business to the realm of personal improvement, see Stanford d.school faculty members Bill Burnett and Dave Evans, *Designing Your Life: How to Build a Well-Lived, Joyful Life* (New York: Knopf, 2016). For a critique, see Peter Lunenfeld, "The California Design Dominion: Thirteen Propositions" in *The Los Angeles Review of Books Quarterly* Number 24, (Winter, 2019) https://lareviewofbooks.org/article/california-design-dominion-thirteen-propositions/.

[16] For an analysis of the habitual as "new" media age and are woven into the fabric of everyday life, see Wendy Hui Kyong Chun, *Updating to Remain the Same: Habitual New Media* (Cambridge, MA: MIT Press, 2017).

[17] Susan Leigh Star, The Ethnography of Infrastructure," *American Behavioral Scientist*, v. 43, n. 3 (November/December, 1999), pps. 377-391, p. 382.

software kluged and repurposed within weeks into teaching tools during a viral and structural meltdown. All the lectures are taped now, though, and "class time" is devoted to a gridded conversation. Our pedagogies are virtual and Zoom-driven, a socially distanced experiment of trying to learn immersed in technology and panic and a desperate urge to envision a future we would all actually want to live in. What the class will look like in the Spring of 2021 is anyone's guess.

THE CREDITS

UCLA Design Futures students, Spring, 2019:

Kiana Abad, Dario Apodaca, Dillon Bastan, Roxana Bian, Josephine Blumencwejg, Alexander Bortolotti, Hua Chai, Li Wen Chang, Liu Chang, Lauren Cramer, Ivana Dama Damjanovic, Alyssa Deering, Emma Doyle, Amy Fang, Madeleine Fisher, Carrie He, Nahee Hong, Ai Jian, Danielle Kim, Jae Hyun Kim, Julie Kim, Adam Knauer, Wonho Lee, Anastasia D. Lewis, Michael Luo, Madux Middaugh, Shreya Neogi, Andrew Ortiz, Ellie Park, Natasha Puthukudy, Skye Qian, Bryant Rahadian, Casey Rickey, Christopher Ruiz, Neeku Salehisedeh, Muling Shi, Brian Sohn, Emily Teng, Gustavo Tepetla, Natalie Tsang, Hana Tyszka, Ariana Wang, Elsie Wang, Jennie Wang, Jonathan Wang, Kai Watanabe, Tuna Wen, Jongho Weon, Nancy Wu, Pengyan Wu, Stephan Xie, and Joanna Zhang.

The guests:

Rem D. Koolhaas from United Nude.

Kate Parsons and Ben Vance from Floatland.

Anne Burdick from the Media Design Practices Program, Art Center College of Design.

The correspondents:

Brenda Laurel (author) *Utopian Entrepreneur*

Mieke Gerritzen (designer/co-author) and Geert Lovink (co-author) *The Amsterdam Design Manifesto.*

The studio/teaching assistant:

Miles Peyton.

CONTINUITY OR SPECIFICITY: INTERACTIVE DIGITAL NARRATIVE AND OTHER INTERACTIVE FORMS AS CONTINUATION OR NEW BEGINNING

Hartmut Koenitz

INTRODUCTION

The development of the artistic use of the interactive digital medium can be traced back for more than 50 years by now. Conversely, the question how to understand, analyze and describe interactive digital forms has been an important question for scholars. In this article, I will trace the development of interactive artifacts focusing on interactive digital narratives. Then, I will identify two broad approaches towards understanding interactive forms, the 'continuity school' and the 'specificity school' to provide orientation about the importance of the choice of analytical frameworks and their impact on research insights.

THE DEVELOPMENT OF INTERACTIVE DIGITAL NARRATIVES

Early interactive digital narratives (IDN) (Koenitz, Ferri, Haahr, Sezen, & Sezen, 2015) can be located in the 1960s, for example Grime's 1961 story generator (Ryan, 2017), and Weizenbaum's famous 1966 AI experiment *Eliza* (Weizenbaum, 1966). Starting in 1975, text adventure games (Crowther, 1976) became a dominant form for a number of years, before graphics on personal computers ushered in the era of graphical adventure games. When the CD ROM storage medium became standard equipment, higher fidelity graphics in games

became the norm, for example in the highly successful puzzle adventure game *Myst* (Cyan, 1993), shortly to be followed by Full Motion Video games (FMG), which combined graphics with varied live action video content. These ambitious productions sometimes featured Hollywood starts and required considerable budgets as many versions of the narrative trajectory had to be shot in order to accommodate the audience's choices. High productions costs were the Achilles' heel of FMG and they disappeared in the second half of the 1990s with the advent of cheaper and more reactive 3D graphics epitomized by games like *Doom* (ID Software, 1993). It was during this period, when the narrative-focused meta-genre of adventure games seemed in sharp decline, causing pundits in the trade press to wonder whether adventure games were dead. An overlooked masterpiece of narrative-focused games, *The Last Express* (Smoking Car Productions, 1997) can be seen as a victim of the circumstances of this period, also because its production method —rotoscoping real-life video was more costly than creating 3D graphics. However, narrative-focused video games were pretty much alive with 3D games increasingly incorporating narrative aspects in titles like *Half-Life* (Valve, 1998), *Bioshock* (2K Games, 2007), *Mass Effect* (Electronic Arts, 2007), *The Last of Us* (Naughty Dog, 2014) and many others. Telltale Games considerable success with titles such as *The Walking Dead* (Telltale Games, 2012) and *The Wolf Amongst Us* (Telltale Games, 2013) brought narrative games even further into the limelight, while *Dear Esther* (The Chinese Room, 2008) and other first-person experience games (FPE) like *Gone Home* (The Fullbright Company, 2013) and *Firewatch* (Campo Santo, 2016) provided room for the exploration of trauma and other deeply meaningful events in the form of IDN. FPE and other works exploring novel narrative forms (e.g. the cross-session memory in *Save the Date* (Cornell, 2013), the relationship narrative without words *Florence* (Mountains, 2018) or the deeply unsettling VR experience *A Breathtaking Journey* (Kors, Ferri, Van der Spek, Ketel, & Schouten, 2016) on the plight of refugees attempting to enter the European Union) can be described as a narrative avant-garde, as I have argued earlier (Koenitz, 2017). Conversely, there is a split in the practice of IDN design —bold experiments in the vein of the above-mentioned examples and traditionalistic

productions stuck in a mindset of cinematic representation, exemplified in the use of long cinematic cut-scenes in big-budget productions like *Unchartered 4: A Thief's End* (Naughty Dog, 2016) or *The Last of Us 2* (Naughty Dog, 2020).

Another variety of IDN (also see (Koenitz & Knoller, 2015)), interactive film, can be traced back to *Kinoautomat*, a showpiece originally made for the Czechoslovakian pavilion at the 1967 Montreal world fair. Already this early experiment revealed the particular challenges to this form. While video games were built on the platform of the digital computer which included input devices as a standard, the canonical platforms for film presentation, the cinema and increasingly the home TV set, did lack any form of input. Consequently, *Kinoautomat* included a custom cinema installation, with buttons for voting at every seat. The alternative, distribution of interactive films on personal computers, was initially hampered by low quality (low resolution and frame rate) and high storage demand. Experiments with a backchannel for interaction on TV sets where fractured and only ever reached critical mass in select markets, most prominently the BBC's 'red button' system (Ursu et al., 2008). Interactive movie and TV works finally reached an international mass audience with the increasing availability of broadband internet. It is for this reason that streaming provider Netflix' *Bandersnatch* (Roth & Koenitz, 2019) is an important milestone, as it exposes large audiences to interactive video for the first time. Interactive Documentaries, sometimes called i-Docs (Aston, Gaudenzi, & Rose, 2017), have a tradition reaching back to the 1980s and Glorianna Davenport's experiments in representing issues connected urban development in New Orleans (Davenport, 1987).

THE ONTOLOGICAL QUESTION

When it comes to the conceptual understanding of interactive digital forms, there is a fundamental dichotomy regarding its ontological status[1]. On the one hand, there is what can be understood as the 'continuation school', which takes

[1] For a discussion of the ontological status of vocabulary concerning the notion of interactive narrative, see (Koentiz, 2018).

digital interactive works as the continuation of earlier forms. Scholars in this camp apply and adapt existing analytical frameworks. On the other hand, there is the 'specificity school' —scholars that emphasize the opportunity for novel forms of expressions based on the material differences and specific characteristics of the digital computational medium. This group of scholar's rethink and challenge established theoretical and practical approaches.

THE CONTINUATION SCHOOL

The continuation school includes a range of scholars rooted in humanities perspectives. For example, Jay Bolter and Richard Grusin (Bolter & Grusin, 2000) frame digital interactive forms as remediating prior manifestations in their influential volume. Earlier, Bolter has positioned hypertext fiction as a way to overcome limitations of the printed book and thus —maybe unwittingly— defined the form in relation to print literature and not on its own merits:

> […] the printed book as an ideal has been challenged by post-structuralist and postmodern theorists for decades, and now the computer provides a medium in which that theoretical challenge can be realized in practice (Bolter, 1991)

More than two decades later, Astrid Ensslin in 2014 described interactive forms of narration as existing on a continuum between literature and video games, again asserting the continuity aspect (Ensslin, 2014). Soulvig Murkherjee in 2012 positions video games applying long-established paradigms, in particular Roland Barthes' extension of "textuality" to cover mediated forms beyond the printed word, Jacques Derrida's understanding of "writing" as the central concept of all mediated expression, as well Gilles Deleuze and Felix Guattari's understanding of the "machinic" (Mukherjee, 2015).

The continuation approach brings several advantages, chiefly the application of well-known theoretical categories and methods for analysis and the recognition and support of established scholarly disciplines and research fields.

Yet, there are also considerable downsides. Theoretical frameworks are made to describe their original object and the further we extend their application, their ability to capture specific aspects diminishes. In addition, terms often lose their original categorial precision as a part of the adaptation process. Espen Aarseth alerts us to exactly that danger:

> Do theoretical concepts such as "story", "fiction", "character," "narration" or "rhetoric" remain meaningful when transposed to a new field, [or are they] blinding us to the empirical differences and effectively puncturing our chances of producing theoretical innovation?" (Aarseth, 2012).

That the method of analysis determines the outcome is a long-established fact, maybe most prominently in the example of the wave/particle debate about the nature of light in physics, which ended with the insight that light has both characteristics and the respective experimental setup —searching for either light or particles— determines the result. In a similar vein, Timothy J. Welsh considers the influence of established analytical frameworks and asks in a review of Ensslin's 2014 book, whether video game narrative has "'matured,' as Ensslin suggests, on its own terms," or rather started to produced artifacts that "sufficiently resemble already established artistic practices and critical traditions." (Welsh, 2015) What we have here is the crux of the issue —are narrative-focused games really literary artifacts, or do they only appear as such, because we apply literary analytical frameworks?

THE MATERIAL TURN OF THE SPECIFICITY SCHOOL

Scholars on the side of the 'specificity school' have emphasized the need for specific conceptual frameworks for a considerable time. The 'specificity school' recognizes developments and models in the natural sciences, e.g. cybernetics (Wiener, 1948) and system theory (Bertalanffy, 1969) and apply them to the analysis of interactive artifacts. Roy Ascott's distinction of cybernetic art (Ascott,

1964; 1968) from earlier forms is an early example recognizing the importance of the artifact and its properties when the art work is no longer a static object, but a dynamic system.

We can see this material turn also in the analysis of narrative phenomena, in arguments for the need to acknowledge media-specific aspects, for example by of Liv Hausken (2004) to end "media blindness" and of N. Kathrine Hayles (Hayles, 2002) to recognize the significance of what was long seen as an unimportant representation layer. When it comes to interactive digital narratives, it is insufficient to for example apply reader-response theory (Iser, 1979) and focus on the interactivity inherent in the reception of fixed narrative artifacts. IDN and other digital interactive forms are dynamic systems, malleable, reactive and in some cases even generative. This material difference is significant on several levels and impacts the ontological status of artifact, creator and audience. Brenda Laurel has consequently framed computers as a platform for interactive narrative expressions (Laurel, 1986) and as the digital medium (Laurel, 1991) while Pamela Jennings has alerted us of the need to consider structures beyond the dominant Eurocentric understanding of narrative (Jennings, 1996) for the interactive medium. Janet Murray in her seminal book *Hamlet on the Holodeck* (Murray 1997) identified the fundamental characteristics of the digital medium (procedural, participatory, spatial and encyclopedic) as well as its experiential-aesthetic qualities of immersion, agency and transformation. Murray also recognizes the changed status of the audience, who are no longer readers or viewers, but interactors, participants not only in meaning-making, but also in instantiating and shaping the product of an interactive system, a particular playthrough. Another significant milestone for specificity is the 'cognitive turn' in narratology, summarized by David Herman (Herman, 2002), a perspective influenced by advances in brain sciences which describes narrative as a cognitive construct which can be evoked by many different manifestations.

Continuing this trajectory, I have introduced the SPP model (*system, process, product*) for interactive digital narratives (Koenitz, 2010; 2015), to capture the systemic aspect of IDN and to distinguish its different elements.

The SPP model describes the digital artifact as a dynamic system containing a *protostory* of potential narratives (Montfort, 2003), to be instantiated by means of an interactive *process* into narrative *products*, either as recordings (objective product) or retellings (Eladhari, 2018)(subjective product).

There are a number of advantages with such a specific approach (of which my model is just one example). First of all, a clear distinction exists from frameworks and vocabulary originally meant to describe fixed narrative artifacts such as the printed novel or film. Most importantly, specific aspects can be analyzed, for example the ability of one digital interactive artifact to produce many different outcomes, or how the audience's interaction with a work shapes a particular outcome.

CONCLUSION

This article has traced the development of interactive digital narratives and related interactive forms and identified two broad conceptual approaches, the 'continuity school' applying and adapting existing theoretical frameworks and the 'specificity school' which empathizes the particular characteristics of interactive digital manifestations and develops specific conceptual approaches. Such a meta-perspective is necessary to avoid long-standing issues in understanding interactive works (e.g. for IDN (Koenitz & Eladhari, 2019)) and also help to comprehend unsolved analytical problems such as the presumed dichotomy between video games and narratives that was featured in the so-called ludology vs narratology debate of early game studies (ca 1999-2004) (Aarseth, 2001; 2004; Eskelinen, 2001; Jenkins, 2004; Juul, 1999; 2001; Murray, 2004). Applying the lens of continuity and specificity schools we can see that this perplexing debate is predicated on a mixed perspective —while arguing forcefully for the specificity of video games, the so-called ludologists frame narrative in line with a continuation perspective, which in this case is particularly traditionalistic. Furthermore, the split condition of video game narrative can also be explained with the same perspective —'continuity' approaches featuring cinematic depictions are still prevalent in many big budget productions

while 'specificity'-minded designers and independent game studios experiment with novel forms of narration.

I offer the perspective in this article with the intent to raise awareness of the influence of the choice of analytical framework on our understanding of the object of analysis. By applying a particular analytical framework, scholars make a choice in regard to the ontological status of the object and types of insights that can be reached. The same issue applies to creators and their choice of conceptual framework. It is crucial to be aware of the implications of this choice.

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CADAVRE EXQUIS
FORKING PATHS FROM SURREALISM TO INTERACTIVE FILM

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INTRODUCTION

The opening scene of the film *Cadavre Exquis* is frozen (stopped in time). Three characters meet in the same room. However, the viewer (who interferes in the narrative) has the possibility to travel[1] through the freeze-frame, getting closer to or moving away from each character. When the viewer[2] gets closer to a character he/she may select him/her. That choice results in a flashback that leads up to the frozen moment. By choosing the last character the viewer will unfreeze the opening scene, setting it in motion.

Three scriptwriters[3] were invited to write the scripts. During the initial phase, the scriptwriters were not aware of the other participants and enjoyed

[1] The technical description of this possibility may be found in the section "*Cadavre Exquis*: the interactive film".
[2] This is a film prepared to be viewed individually. Although it can be viewed by several people simultaneously, only one of the viewers can interfere in the narrative (the one who has control over the interface).
[3] Vitor Reia Batista, Coordinator of the Film Studies Lab at the Centre for Research in Arts and Communication (CIAC); Miran Tavares, CIAC's Coordinator; and Rui António, PhD student in Digital Media-Art at the University of Algarve and at Universidade Aberta.

full creative freedom over their character: each narrative would have to begin, at most, 24 hours earlier, and end in a room shared with two other characters.

The film *Cadavre Exquis* is part of the project *The Forking Paths*, which is available in an online platform (oscaminhosquesebifurcam.ciac.pt) dedicated to interactive film experiments. In addition to other experiments, the platform includes the films produced for the project: *The Book of the Dead* (2019), *Valsa* (2015) and *Haze*[4] (2014). The project *The Forking Paths* began in early 2013, at the Centre for Research in Arts and Communication (CIAC), Portugal. It was implemented in the Film Studies Lab (LEF) and is part of CIAC's wider research "Creation of Digital Artifacts". CIAC's mission is to produce digital artefacts that seek intrinsic connections between art and technology. The aim of this project, which has multiplied itself into several interactive film experiments, is to conduct an original research targeting the discovery of potential new knowledge, namely through practice and through the results of this practice. The Forking Paths platform intends to bring together experimental interactive films of different origins, genres and formats that seek to develop innovative connections between the spectator-user and the narrative. Using different models, we propose an interaction that focuses less on the narrative issue and develops through potential aesthetic choices from the viewer. Ultimately, this project, in particular the interactive film *Cadavre Exquis*, seeks for clues that may lead to possible paths within the evolution of audiovisual language.

CINEMA AND SURREALISM

The first surrealist film is Germaine Dulac's *La Coquille et le Clergyman*. The poet Antonin Artaud made the script and then rejected the film. He had several motives, the main one was perhaps Germaine Dulac's production, which failed to achieve the poet's vision: "I thought that a script could be written withou takink into account the knowledge and the logical connection of the facts (…). For example the possibility for a script to resemble and relate to the mechanics of

[4] Present at *FILE*, Electronic Language International Festival, 2015, São Paulo.

a dream without being the same dream". (Artaud, 1995). If Dulac did not fulfill Artaud's ambition, Buñuel and Dalí came very close with *Un Chien Andalou*.

In 1965, during the celebrations of the 40th anniversary of Surrealism (1924-1964), which triggered exhibitions and debates, the magazine *Études Cinématographiques* (1965) published two volumes dedicated to surrealism, specifically on its relation with cinema, trying to clarify not only what surrealist cinema was supposed to be, but also what could be accounted for as surrealist in cinema. In general, when talking about cinema and vanguards, with its manifestos and theories, there is little information on a surrealist theory of cinema, or even on a concrete movement that brought together surrealist filmmakers and cinema theorists. But the relationship between the two is undeniable as are the many ways they have undergone through multiple interpenetrations. What the studies and testimonials published in this magazine do is try to reestablish the relation between cinema and surrealism, not only as an enchantment that the former exerted on the second and vice-versa, but also by showing it is possible to speak of surrealist cinema.

To question the relations between cinema and surrealism implies understanding everything involving these relations, because, according to Gianni Rondolino (1977), the formulation between cinema and surrealism is "ethics, even before aesthetics, at the basis of which was the overcoming of everyday reality in a global experience.". Thus, the basic concerns of surrealism, its ethical and moral background, will lead the rapprochement between the surrealists and cinema, first as mere spectators. Soon they started producing their own dreams materializing them on the screens.

Michel Beaujour believes that cinema and the arts that claim to be surrealist are both condemned "to bastard compromises by the rigidity of a doctrine developed with the intention of bringing about a revolution, not aesthetic, but moral and social"; this condemnation is no more than all the ethical commitment that guided surrealism in all its actions. Let us not forget the words of Gianni Rondolino when he states that the relations between surrealism and cinema were more ethical rather than purely aesthetic.

If talking about surrealism and cinema is somehow talking about what is *ailleurs*, it may lead us to think that there was no such thing as surrealist cinema. In his book *Surrealism and cinema*, Michael Gould (1976) begins by apologizing for the title of the book for it may be misleading. He doesn't just devote himself to writing about those who are considered surrealists, those related to the movement at some point in their lives, he will also address a certain surrealist sensibility because, according to him: "If surrealism is anything, it is not what one would expect it to be; it is *something else*" (the emphasis is ours). For Gould (1976), limiting the surrealist experience to the surrealist movement and, more so, trying to classify cinema according to categories used for other arts implies running the risk of incurring simplifications.

"Jean Cocteau once remarked that all films are surreal" (Gould, 1976). And Gould (1976) believes he was right because the surrealist experience may occur in the very process of perceiving the film, just as Buñuel invites "every spectator of his films (…) to use the pictures as most useful to him" (Gould, 1976), the public is therefore the one who needs to possess a surrealist sensibility and perceive the films as such. Cinema has features that allow the viewers to participate in surrealism, directly or indirectly, either through the construction of the film or simply by watching it. But Gould recognizes that this sensibility, although potentially present in everyone, manifests itself in the true surrealists, capable of, like Dalí, seeing everything as *a possible surreal goldmine*. What is important for Gould is to show that the relationship between surrealism and cinema is beyond motion and may be found in filmmakers as diverse as Sternberg, Samuel Fuller, and Hitchcock.

Gould (1976) draws a line between movement *per se* and a sensibility that may be considered *quite another matter*. The definition of a surrealist sensibility is essential to realize that surrealism is beyond the movement and that it has influenced cinema in several ways. The acknowledgement of this influence goes beyond the barriers of the vanguards when Vincente Minnelli says that: "The possibilities for using surrealism in cinema are wide and exciting." (Betton, 1987), thus, speaking about surrealism and cinema always implies

speaking about something that surpasses cinematographic theories, making it necessary to understand the surrealists' conception of cinema, in order to define what may effectively be regarded as surrealist cinema.

Generally, it is said that "Few films are, in essence, purely surreal." (Betton, 1987). Those who are regarded as such, *La coquille et le clergyman*, by Germaine Dulac; *L'étoile de mer*, by Man Ray and Robert Desnos, and the first two by Buñuel and Dalí, *Un chien andalou*[5] and *L'âge d'or* (Betton, 1987), are usually followed by Cocteau's first film, some films by Jean Vigo or *Animal Crackers* by the Marx brothers, as well as some animation films. But if we take Cocteau into consideration, when he says that all films are surrealistic, it becomes difficult to find surrealist cinema which, we believe, is beyond the films mentioned above, but it does not include all films either.

Later, in 1979, in the "XV Confrontation Cinématographique de Perpinyà", dedicated to surrealist cinema, it proved difficult to characterize this type of cinema (Romaguera i Alsina, 1989). Only those films that were directly related to the movement were given this category, despite a clear indication of a much wider influence of surrealism on cinema in general. In 1924, Max Morise published a chronicle, *Les beaux-arts*, in the 1st issue of *La révolution surréaliste*. Among other things, he argues that "the succession of images, the flight of ideas are a fundamental condition of any surreal manifestation" (Betton, 1989). For Morise (1924) there is a surrealist plastic present in literature, painting or photography created by the group. The possibility of a succession of images offered by cinema, and, mainly, the fact that it conveyed a greater simultaneity than other arts, such as painting and sculpture, "paves the way for the solution of this problem." In addition, cinema, an art that happens in time, is very close to the surrealist desire to create an image that begins in an instant and goes back and forth, drawing a curve comparable "to the curve of thought".

[5] This list is provided by G. Betton in the book *Textos y manifiestos del cine*. The film by Man Ray and Desnos does not appear on the list of pure surrealist cinema.

Therefore, if the possibility of recovering the course of thought, i.e. the flow of the unconscious and letting it surface in its own temporal extension, is, for the surrealists, an essential component of their artistic making, cinema emerges as something that makes it technically possible to accomplish this art form. Another important component of surrealist art is the attempt to recover not only the course of thoughts but also the dream itself.

The spirit present in the creation of *La révolution surréaliste*, in 1924, is the spirit of undertaking a confrontation against the Cartesian domain of reason. According to Breton (1994), the contributors of the magazine agreed on the following points: "the surrounding world, which calls itself Cartesian, is unsustainable, mystifying, unsightly, and any forms of insurrection against it are justified.". It was necessary to change the state of things and seek a way that no longer divided man into two: reason and instincts. Based on Freud's teachings, surrealists sought to show their ability to reveal more about man, especially in the field of dreams, than the pure reason of waking states could ever convey: "For Freud, this world is the symbol of unconscious desires, unconfessed tendencies; and, by deciphering it, man would come to an integral awareness of himself."(Duplessis, 1983).

The Surrealists proposed to dismantle the construction of narrative logic (both syntactical and semantically), which largely explains their attraction to authors like Mallarmé, Rimbaud and, of course, Isidore Ducasse. This also explains their attraction to a medium, such as cinema, which allowed using montage techniques as well as other technical possibilities in order to break the rules of writing and create a narrative fully based on images. But this rupture did not relinquish a connection with the real world. For they sought the marvelous and, according to Bréchon (1971), for the surrealists the marvelous was born of a conjectured and desired presence, unlike mystery which always conveyed a certain sense of absence.

Just as Buñuel believed that the world had not undergone the transformations the surrealists desired, so did the artistic achievement of the surrealists fall short of their yearnings. Not in the sense of the undeniable

quality of their works, but because of the difficulty of the task they set themselves to escape from the impoverishing rhetoric and to penetrate the mysteries of the human soul —the unconscious— letting it steer the process of creation.

Fernando Trueba (1998) comments, in his *Diccionario de cine*, that Dalí "he detested the avant-garde cinema that was practiced, mainly in France, in the 1920s. And it is true that nothing could be further from surreal automatism than those elaborate formalist exercises". Ironically, when Dali sent Harpo a script for a film by the Marx brothers, it was rejected, probably because he closely resembled the films he himself despised. What, at first glance, seems only a fact of the anecdote about Dalí's character, can be used to explain the surrealists' dilemma, and their great frustration: in many moments their intentions surpassed their own achievements.

In any case, it is acknowledged that the relation of the surrealists towards cinema is much more that of spectators than of directors. For Artaud (1995), and for surrealists in general, " cinema is essentially revealing of a whole occult life with which it puts us directly in relation (…); cinema seems to me especially made to express things of thought". Bringing this belief onto the screen proved to be much more difficult. Mainly from what has already been observed, even though cinema is a moldable material, it is not as evanescent as surrealists would wish, and always promotes a kind of creation, which, as a rule, betrays the principles of surrealism (Magny, 1986).

Therefore, surrealists prefer to let the poetry emerge, with a certain primeval freshness, without masking it through intricate means of completion. Of course, there is a certain distance between surrealistic *intention* and *gesture*. But, guided by ethics, they seek to be faithful to their principles. If we think of the surrealist movement itself, with its date of birth and death, we will see that there were few productions, although, as spectators, many were the films included on the list of Breton's group. If we think of the surrealist spirit, considered eternal, or if we think as Cocteau himself that all films are surrealistic, there is no need for this anguish to meet the definition.

SURREALIST TECHNIQUES/AESTHETICS AND CADAVRE EXQUIS

Reality penetrated the body of artistic creation: photography and cinema, even in their most radical manifestations, provide a frame of captured light and reality. Their ability to capture the world apparently separated both cinema and photography from the field of Arts themselves.

Meanwhile, the poetry of the new medium was soon apparent, and cinema was absorbed by the artists. The oneiric nature of film, with the image appearing from, and in, the shadows, opened the way for Surrealist cinema. They tried to recreate poetry on screen with words and objects from the world of painting and literature.

Yvonne Duplessis (1983) describes what she considers to be the "surrealistic techniques" also converted in "poetics "of the creation surrealist itself: humor, the marvelous, dream, mental alienation, *Cadavre Exquis* and automatic writing. In the First Manifesto, Breton reveals the "secrets of magical surrealist art" —here he teaches how to create a surrealist text and what can be the utility of being a master at such a craft. Breton, ironically, not only criticizes literature in general, but he also uses one of his techniques, humor, to better make himself understood. Thus, we see surrealism being built by the authors of choice within the group, using words and/or images contrasting the common usage.

Jarry and Cravan, and especially Jacques Vaché, had a very special notion of humor and were important influences for Breton and surrealism in general. In 1939, Breton writes *Anthologie de l'humour noir*, emphasizing in the preface Freud's comments that declared the importance of humor as a source of liberation. And it is precisely this sense of liberation and pursuit of pleasure that is intrinsic to a certain type of humor that will fascinate surrealists. In addition to humor, as an element capable of destabilizing everyday life, surrealists sought other ways to create, escaping the constraints of rationality. Several experiments were carried out by the group (when the First Manifesto appeared, it already had five years of experimentation behind it), including automatic writing, dream revelation, hypnosis, games, everything that took

them to the second states, which, for Breton (1995): "What passionately interested was the possibility they gave us of escaping the constraints that weigh on watched thought."

Cadavre Exquis, for example, was a game that tried to break with the codified mentalities. "Several people gathered pass over a paper in succession, on which each one writes a word or makes a line; it ends up obtaining a succession of improbable phrases or a design that defies any reality. The example made classic, and which gave the game its name, refers to the first sentence obtained in this way: *Le cadavre exquis – boira le vin noveau*" (Duplessis,1983).

INTERACTIVE FILM

The evolution of the forms of immersion in the history of cinema has contributed to a paradigm shift: the narrative thread does not have to be linear and the doors to an effective interaction between the narrative and the viewer(s) are opened. Nowadays, experimental cinema and digital media use the most advanced technologies as aesthetic strategies that seek to submerge the public, giving them the freedom to build the narrative, by interacting with it. Like the first films of the Lumière Brothers, which emerged as a form of entertainment, some of the earliest forms of audiovisual interactivity also took place at fairs and theme parks, where the viewer senses what is happening on the screen: vibration on the chair, water jets, among other features that allow us to engage other senses, besides our sight, making the experience more complete and more immersive, just as Heilig idealized his *Cinema of the Future*. In the study on the effect of immersion in virtual art, Oliver Grau states: "popular and spetacular versions of virtual spaces existed as amusement park and fairground attractions in the 1970s and 1980s, particularly in the form of small immersive circular cinemas" (Grau, 2003), confirming the idea that most of the inventors of audiovisual media were illusionists, whose interests were focused on entertainment shows for the masses.

Zielinski describes the early experiences at movie theatres as "a darkened room, where the spectators, like Plato's cave dwellers, are virtually held captive

between the screen and the projection room, chained to their cinema seats, positioned between the large-size rectangle on which the fleeting illusions of motion appear devices that produce the images of darkness and light" (Zielinski,1999).

According to Lev Manovich, computational technology has become the new cultural motor in the last decades, allowing the reinvention of the media (Manovich, 2013).[6] However, according to Baudrillard (Baudrillard, 1997), an author with a pessimistic view of new technologies, interactivity with machines does not exist, or at least does not imply a real exchange. In other words, there is no interactivity when it comes to exchange: there is a certain interest in rivalry or domination behind the interface. Lunenfeld also expresses some reservations about interactivity, particularly regarding cinema. According to this author, the experiments around interactive cinema have not yet been successful, nevertheless he admits that it is a developing field and that we can still reach a level of interactivity, where the spectator-user can fully take on a role of both director and editor (Lunenfeld, 2005). Manovich, in turn, argues that interactive virtual worlds seem to be the logical successors of cinema and, potentially, the cultural motor of the twenty-first century, just as cinema was the cultural motor of the twentieth century (Manovich, 2011).

Against a certain degree of pessimism, several film projects have tried to apply interactivity in cinema, either at the stage of *montage* (transforming viewers into co-authors of the creative process) or at moments of bifurcation, where the viewer chooses the path to follow, among two or more possibilities, or offering different viewing options for the film narrative. Several are also those claiming the title of "the first interactive film" in the history of cinema. One of the most successful projects is the Czechoslovakian film *Kinoautomat – one man and his house*, created in 1967 by Radúz Činčera, for the World Expo in Montreal. In this film, the audience is asked (nine times) to choose one of two given possibilities to continue the narrative. At the first screening in Montreal, the process of choice was mediated by an actor.

[6] Here we safeguard chronological distances between theories.

Several projects allow the viewer to opt for one of two endings. This is the case of the film *Mr. Sardonicus*, produced and directed by William Castle, in 1961. Before the final scene of the film, the viewers can vote using a card they are given at the beginning, with two possible drawings, just as it happened in the Roman arenas, where the gladiators fought to entertain the audience: a thumb up and a thumb down, which allows them to choose whether the character should be mercifully spared and live or be punished and die.

I'm your man, directed by Bob Bejan, in 1992, also claims the title of first interactive film in the history of cinema. Just as in previous projects, the viewers decided the unfolding of the narrative using interactive buttons installed on their chairs.

Another film announced as "the first interactive film in the history of cinema" was released in 1995, *Mr. Payback*, written and directed by Bob Gale. Depending on the audience's interaction, this film lasted approximately half an hour. The viewers were called upon to decide at various points in the narrative, again, by using a remote which was attached to the chair. The film was not very well accepted by the critics, mainly due to the absence of a plot, nevertheless it marked an important step in the way viewers experienced cinema, although the experience itself has been considered by many more like playing a videogame rather than watching a film. Inspired by the work of William Castle in the 1950s, John Waters used the Odorama in the films *Pink Flamingos* (1972) and *Polyester* (1981): the audience members are given 10 numbered scratch cards that release scents. Having an important role in the narrative, these scratch cards must be sniffed as their number appears on the screen. In 2000, Berlin artist Florian Thalhofer[7] created the *Korsakow System*,[8] an application that allows users without any programming experience to build relatively complex non-linear interactive

[7] http://korsakow.org, http://www.thalhofer.com

[8] During some research to produce a documentary on alcohol consumption, Florian Thalhofer learned about the Korsakow Syndrome: a neurological process that leads to the loss of recent memories and to a compulsion to tell stories, frequent among chronic alcoholics. It was based on these experiences that he built the Korsakow System.

narrative projects, which can later be viewed online or on DVD/CD-ROM. In the Korsakow System, the narratives are based on SNUs (smallest narrative units) that have multiple points of contact between them. Thus, a K-film consists of a collection of SNUs with multiple points of contact with each other. This system was widely publicized in Amsterdam, namely by Mediamatic, a Center for Arts and New Technology, which allowed its wide exploration, constantly testing the boundaries between cinema and technology. The program is available for download (through paid licenses), as well as tutorials that facilitate its use. This system allows users a new level of creativity in the context of storytelling, raising the issue of "authorship" for debate, since the viewer is both author and user.

Between 2002 and 2005, Lev Manovich devoted himself to the development of the *Soft Cinema*[9] project, a dynamic computer-oriented installation in which the viewers can, in real time, build their own audiovisual narrative from a database containing 4h of video and animation, 3h of narration and 5h of music. Although the *montage* technique can be found here, the intrigue in the narrative is non-existent. The *montage* sequence results from a pre-programming process carried out by the viewer using the keyboard. The narrative is generated by the database. According to Manovich (2011), the database is the counterpart of the traditional narrative form. The concept of FJ (film-jockey)[10] was created with this project. The result of this work was published in 2005, in DVD, demonstrating the possibilities of the software when applied to cinema. In the three films featured on the DVD, human subjectivity and the choices made through a custom software are combined to create movies that can be rearranged endlessly, without ever repeating the exact same narrative sequences. Thus, in each viewing, the spectator-user encounters a new narrative. In addition to the DVD release, the project has been widely exhibited in museums, galleries and festivals all over the world and has served as the practical basis for research on interactive cinema.

[9] http://manovich.net
[10] http://www.softcinema.net

Switching: An Interactive Movie (Morten Schødt, 2003) is a Danish film that has the DVD as the main media. Its innovation is that there are no specific points to choose the path to take, the narrative is structured around a circular system in which everything repeats itself. The spectator-user can intercede at any point in the film, moving to different times and places within the narrative. The interface and content are not divided, the movie itself is the clickable object.

Late Fragment,[11] from 2007, is a co-production between the *Canadian Film Center* and the *National Film Board of Canada* that offers an arborescent structure where the spectator-user is able to choose different paths and gain new perspectives regarding the narrative by choosing which character he wants follow.

Later, in 2010, the horror film *Last Call* of 13th Street, a television channel specialising in horror films, was announved as the world's first interactive horror film. Using a software that enables voice and command recognition, one of the spectators present in the movie theater receives a phone call from the protagonist asking him/her to help her choose the best way to escape the serial killer who is chasing her. Through this technology, the film becomes unique depending on the instructions of the person who answers the phone.

Take This Lollipop,[12] directed in 2011 by Jason Zana, includes data and images of the spectator's Facebook profile in the narrative as a strategy to take him/her from an extradiegetic to an intradiegetic level. In 2012, Evan Boehm and Nexus Interactive Arts create *The Carp and the Seagull*[13] an interactive 3D movie that takes advantage of WebGL and HTML5 technologies. The film describes a tale of the fisherman Masato, who one day encounters the spirit Yuli-Onna that appears to him in the shape of a seagull.

In 2006, at the *Hong Kong Disneyland* theme park, *Stitch live*, a combination of digital puppetry, real-time animation and holographic projection emerges for the first time. In this show, which can now also be seen at Disneyland Paris

[11] https://www.latefragment.com
[12] https://www.takethislollipop.com
[13] https://thecarpandtheseagull.thecreatorsproject.com

and Tokyo Disneyland, the virtual character talks directly with the guests with the help of a moderator. Children are encouraged to sit in the front row so that the virtual character can easily "see" them, facilitating the communicative process between the animated 3D character and the young spectators.

In 2014, the film *Possibilia*[14] (2014) is released, directed by Daniel Kwan and Daniel Scheinert (the DANIELS).[15] In this film, Rick and Pollie are in a difficult separation process. Pollie is preparing to move out and leave Rick. He asks her to stay and they start a fight. The public is given the opportunity to watch the argument between the characters through different perspectives, offered by small images (thumbnails) that are at the bottom of the screen. The text remains the same, however the perspective and the tone of the argument change according to the spectator-user's choices. Throughout the film, these small parallel images multiply themselves, allowing the spectator to change the way the story is told, while maintaining the same argument. At the end, having exhausted all possibilities, Pollie returnes to the door, leaving Rick alone, closing the film narrative at the point where it had begun.

The project *Circa 1948*[16] (2014), by Loc Dao, leads spectator-users on a virtual tour to different places in Vancouver just as they were in 1948. This is achieved using projected images all over a room to surround the spectators. Their movements are followed by kinetic technology.

However, recent examples of interactive film experiments, such as Tobias Weber's *Late Shift* (2016), continue to adopt the same structure used by the pioneering interactive films in the 1960s: an arborescent structure based on a simple and occasional choice made at certain moments of the narrative, where the spectator-user can choose path A or B.

[14] This film was produced with technology of the digital media company Interlude, known for the recent interactive video clip *Like a Rolling Stone* (http://video.bobdylan.com/desktop.html).

[15] http://www.danieldaniel.us

[16] There is also a homonymous application available for IOS.

CADAVRE EXQUIS: TIME

Philippe Soupault (1965), in an interview with Jean-Marie Mabire published in the aforementioned volumes of Études Cinématographiques, stated: "Cinema was for us an immense discovery, at the time when we were developing surrealism. (…) we then considered the film as a wonderful mode of expression of the dream." Cinema has a feature that will make Breton's dream come true: the possibility of fragmenting time, of showing past, present and future simultaneously. "(Time) is maimed, plundered, annihilated. The present and the future no longer contradict each other. We live today and tomorrow, just as easily as today; we live until, simultaneously, yesterday and tomorrow" (1982). Time in cinema was perfect for those who wanted to bring out the structure of dreams.

Barry Dainton (2010) summarizes the different proposals of the structure of temporal consciousness into three models: Retentional Model, Extensional Model and Cinematic Model. In the Retentional Model, the experience of change and succession occurs in episodes of consciousness, whose contents represent temporally extended intervals, despite the lack of temporal extension. These episodes have a complex structure and comprise the momentary phases of immediate experience as well as the retentions of the recent past. The streams of consciousness are thus composed of successions of these momentary states. In the Extensional Model, the episodes are themselves temporarily extended and are able to incorporate changes. The streams of consciousness are composed of successive episodes of extended experience. Finally, in the Cinematic Model, immediate perception lacks any temporal extension. The same applies to the contents we are directly conscious of, which somehow resemble photograms. The stream of consciousness is thus composed of a continuous succession of momentary states of consciousness, hence resembling films that consist of frame sequences.

The idea of a freeze-frame (of the opening scene) is just that: a frame with no sequence. However, in the film (*Cadavre Exquis*) the viewer can travel through the photogram[17], giving it a sequence: a possibility of a past and a future, or

[17] Using two keys, the viewer may travel within the freeze frame, moving forward or backwards.

better, a possibility of new present frames taking place after or before the initial photogram. The aim is to achieve a relaxation and a reconstruction of the idea of time in cinema, where the relation between space and time is overruled by an eminently oneiric temporal dimension.

The notions of movement-image, time-image and crystal-image, proposed by Deleuze, serve as structuring basis for the film *Cadavre Exquis*. By appealing to immersion, they cause a reaction contrary to the usual passive-submissive reaction. According to Deleuze (1990), the sensory-motor sensations, indirect representations of time, tend to be replaced by exclusively visual and audible conjunctures, namely the *opsign* and the sonsign, direct representations of time. Through this theoretical background, *Cadavre Exquis* uses eminently visual situations by means of a control of an inner movement of the shot, endeavoring to meet the *opsign* concept. It is also related to the concept of *sonsign* in sound situations that arise without any corresponding or related images.

We intend to come closer to the idea of surrealist film through a collective and, in a way, unconscious process of script creation. As mentioned in the introduction, three scriptwriters were invited to create three narratives based on a character who, at the end of the narrative (24 hours later, at most) would meet two other characters in a room. The scripts would form a succession of sub-narratives which, just as in the *Cadavre Exquis* game, converge in the main narrative, eventually ending up in a succession of unlikely scenes. A common opening scene would be added: the scene of the three characters in the same room. It is hereby intended a connection to the idea of automatism and to the processes that govern the unconscious: dream-condensation and dream-displacement are not perceived at the time they occur; while we are dreaming we are not aware of the process.

Just like the window that cut the man from Breton's dream in two, so does reality move across the body of artistic creation: photography and cinema, even in their most radical manifestations, carry with them the light imprint of some captured reality. Cinema has quickly showed how it transformed the reality that crossed it in very particular images. It evolved using its own means. For some, such as André Malraux, a cut within a scene was the debut of Cinematographic Art,

i.e. the appearance of the *montage* technique. The *Montage* technique is a topic where opinions both converge and diverge, but it is, undoubtedly, one of the main issues introduced by cinema. The montage technique enables the recreation of the structure of dreams, allowing a circularity promoted by dream-condensations and dream-displacements. In the specific case of the film *Cadavre Exquis*, this potential is amplified by the possibility the viewer is given of interacting with the film, enabling a spontaneous creation process. The viewer's choices make the movie happen. Random choices that build and destroy a latent structure.

The opening scene: three characters are in a room. A complete freeze-frame. The viewer is offered the possibility of manipulating this film frame. The movement within the freeze-frame allows the viewer to move in to a close-up or away from a close-up of each character. When a character is displayed in a close-up, we can select him/her. The selection of a character triggers a flashback that shows the viewer the character's recent past. Finally, when the past of the three characters has been visited, the action is set in motion and we are taken to the present, i.e. to the opening scene.

The sequencing of ideas in the film does not obey a discursive logic, presenting itself as "a construction where we would not use joints or cement". Meaning and syntax diverge often, causing a rupture in speech, which is amplified even more by the very particular use of punctuation, to the extent of utterly suppressing it in certain parts. For Bréchon, not using punctuation, a process he believes was created by Apollinaire and *Cendrars* and widespread by surrealism, is a way of *rétablir la continuité de la parole poétique*. The film is supposed to consist of a continuous movement of the word (absence of punctuation) and the discontinuity of images.

IMPLEMENTION OF THE INTERACTIVE FILM

Cadavre Exquis was implemented as an installation controlled by motion detection. At the time of this writing it has been presented to the public three times: At the Literary Festival of Macau, China, in March of 2019; at *FICLO* (Festival of cinema and literature) in Olhão, Portugal, in April of

2019; at Artech 2019, in Braga, Portugal, in October of the same year (Silva et al, 2019).

This provided us with the opportunity to observe the public's reaction, discussed ahead.

SPECIFICATIONS

In this section we briefly review the implementation details of the interactivity modes in *Cadavre Exquis*: the spectator/user starts at an establishing shot (State 0) of a room (R1) where three characters (C1-C3) are visible and then the camera settles on the rightmost one (character C1). Through motion detection the user can then pan the camera back and forth between the three, or select the character currently in focus. Selecting characters C1 or C2 plays their respective films (M1 or M2), then returns the viewer to the original room; selecting character C3 plays its film M3, then brings the viewer to the same room, but at a different moment (R2), where character C3 has been replaced by character C4. In this new section, all works as before except that selecting character C4 plays its own film, then resets the program to its initial state (State 0).

HARDWARE AND SOFTWARE

The software for the interactive film was developed in *Processing*, an open-source graphical library and IDE for the Java programming language, popular among digital artists. The main form of user input was body motion, detected through a Microsoft Kinect, and this was programmed through the KinectPV2 (Kinect for Windows v2) Processing library. The Microsoft Kinect is a motion sensing input device produced by Microsoft, originally designed as a gaming device but much used by digital artists for a myriad of applications. We used the 2013 Kinect for Xbox 360 version with a PC adapter. This version can capture video at 1080p, has an IR sensor that can track a user in the dark, and can track the motion of up to 6 users, with 25 joints tracked per skeleton.

The rather hefty demands that Kinect puts on the hardware (both in terms of processor speed, graphics card and interface, requiring a dedicated USB 3.0

Figure 1. Frame of the interactive film *Cadavre Exquis*.

port) caused some difficulties with the hardware we had available at the start of this project. These difficulties might not deserve mention had they not led to some design choices that may be of interest, which shall be discussed ahead.

FINITE STATE MACHINE: STATES AND INPUTS

The *Cadavre Exquis* software was implemented as a simple finite state machine. At each moment the program is in a particular state, and at each cycle a check is performed to see if certain conditions are met; if they are, the machine changes state and the cycle repeats. The new state is entirely determined by the previous state and by the input or environment conditions that are tested for. There is nested looping structure to the machine, with two main hubs (the two distinct moments in the room where the characters sit) that fork into three films each, one of the films connecting the first hub to the second. Although there is a directional structure to the film from the first moment in the room to the second and finally to the payoff mini-film that serves as conclusion, there is a loop structure at the finite state machine level, as the user can go back to the start of the experience by raising his left hand at any moment. This action lives at a metalevel, as it does not integrate into the narrative itself, but rather resets it from outside.

It may be useful to exemplify what we mean by a finite state machine. We can represent it by a directed graph as in figure 2. Each state is represented by a node, and each directed edge corresponds to a change of state triggered by some test, e.g., a timed activation, a user action, etc. For instance, in the node corresponding to state R1C1 (waiting at the first character of the first instance of the room) there are two outward arrows —one is activated by the raising of the user's right hand, and leads to the state where the film of the first character is played (state *Play_Film_R1C1*). The other leads to state *R1C1_to_R1C2* where a film is played corresponding to the panning movement from character 1 to character 2. These end states have their own checks in turn. For instance, State *R1C1_to_R1C2* allows for no user interaction and is self-terminating, the transition to state *R1C2* (camera stopped on character 2) being triggered by a timing event of the movie itself (it ends when the camera centers on character 2). State *Play_Film_R1C1* can also self-terminate, when the playing of the short film of character 1 ends, but it can also terminate before that if it receives user input (crossing hands above the head, which advances the film to the end, or raising the left hand, which resets to *State 0*). So we see that the program is a repeating cycle where the computer checks for events either from user input or from the computer itself (timing events, such as end-of-file events, etc.) and follows a set of rules for changing states.

The most important events are the user's gestures, which were the following. For version 1, presented in in the literary festival of Macau:

While in the room with the three characters:

- Swipe right hand to the left: pan camera to left of current character.
- Swipe left hand to the right: pan camera to the right of current character.
- Raise right hand: Play film of the character on which the camera is centered.
- Raise left hand: Reset film to state *INIT*.

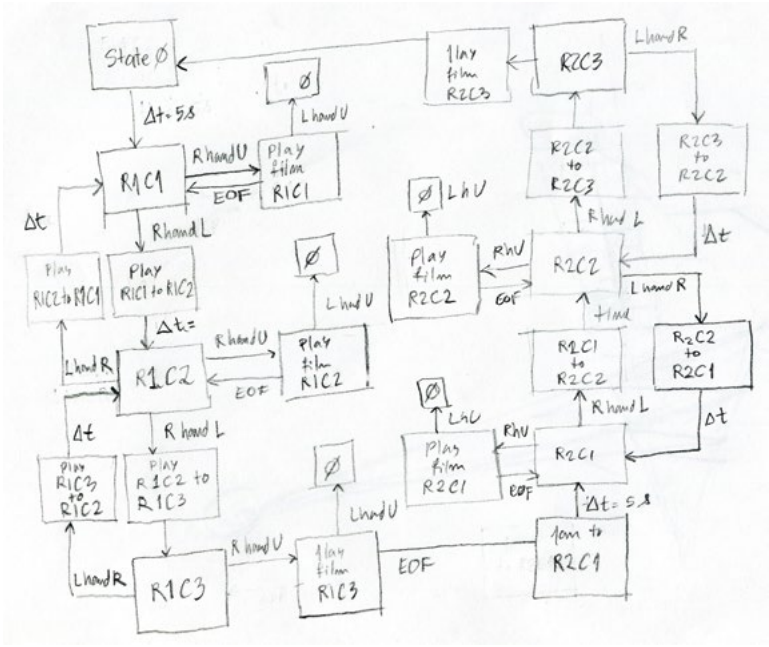

Figure 2. The section of the finite state machine around note R1C1.

While playing a character's film:

- Cross hands: End a character's film and return to the room.
- Raise left hand: Reset film to state *INIT*.

For version 2, presented in Olhão, all was the same except for the last motion, which was replaced by:

- Cross hands above head: End a character's film and return to the room.

However, the finite state machine was altered in this case, as the commands might be entered at different moments than in version 1. We will discuss this ahead. In both cases the possible interactions were explained to the visitors by signage (figure 3):

Figure 3. Signage presented to the visitors at the Macau exhibition.

The installation itself consisted of a white tent (figure 4) on which a single user might enter at a time, to be confronted with a table on which a monitor stands, and beneath it a Kinect sensor pointed at the user. A black cloth makes the technical ensemble less conspicuous and hides the controlling PC under the table. At the entrance is signage that explains the possible motions, and always one of the authors, or a helper, that demonstrates these motions at the start of the process. Then the user enters the tent to confront the initial scene of a room with three characters. An interesting aspect regarding the tent is that it appears in a scene of the film itself, providing a connection between the physical installation and the narrative —the spectator steps into the environment of the film and recognizes that fact only upon watching the action, as if belatedly recognizing that, rather than peeking into someone's dream, he is watching from inside it.

SLIGHT OF HAND AND MISDIRECTION —PROVIDING FOR WEAK HARDWARE

The Microsoft Kinect has some hefty requirements on hardware and initially we needed the program to work in some rather inadequate computers: we had the frame rate barely going above single digits. This led to some design decisions in version 1 of the program. We limited detection to a single user, and kept the panning motion interaction limited only to the static states, i.e., the user's input was only taken when the camera had centered on a character

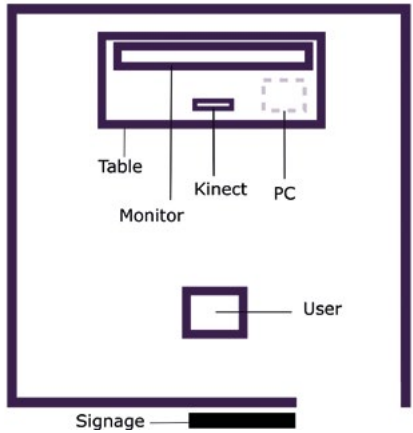

Figure 4. Plan view of the installation.

and stopped its panning motion. Only then were the user's motions queried to see where the camera should move next, or whether the character's movie should be played. If a panning motion was selected then again the camera would pan to the next character, and during that motion the Kinect would be turned off. This provided an interaction that, though limited to a few instants, was more fluid and responsive when available. Also, it avoided glitches in the video on hardware that was already very taxed.

There was another design decision, of special interest as it carries a bit of misdirection. The original idea for the motion detection in the character selection was for the swiping hand to be followed, performing a linear mapping of hand position to video position, made smoother by a motion easing calculations. The problem is that this may not work so well when the frame rate is very low. So we decided for a gesture that would require only a very weak tracking. But we still wanted the gesture itself to be a wide, flowing one, as this performative aspect is important for the user's feeling of interactivity. We opted for a wide sliding gesture: to pan the camera to the left (resp. right), the right (resp. left) hand slides from rest position to the left (resp. right) side of the body. This wide motion was demonstrated to each user as he entered the installation. The wide gesture gives the user the implicit notion that the whole

motion is being tracked, but in fact there is a ruse here: we ignore the movement completely and check for only one condition: is the right hand to the left of the left hip (for the other case, substitute every left/right for right/left). This is a static test only, designed to look and feel like a dynamic one. The final position is easy to reach in the flowing motion that is suggested but is hard to reach by accident otherwise (preventing accidental activations). It is also awkward to maintain once reached, as the hand will go naturally back to rest before the panning transition between characters is played out —this avoids accidental activation of unwanted further panning. Finally, the fact that the test is performed at the end of the arm's motion helps to catch it with poor hardware, as this position of momentary stop and direction change (at the end of a pendulum motion of the arm) is held for a longer fraction of a second that any other in the motion itself.

REACTIONS TO EACH VERSION OF THE FILM, AND SUBSEQUENT CHANGES IN DESIGN

In the first presentation of the film, in Macau's Literay Festival, we gathered the following lessons from the user interactions:

- It was crucial to demonstrate the motions and to explain the interaction verbally before starting, in spite of the written introduction and signage at the entrance of the tent. Otherwise there was a steep initial learning curve.
- After a short demonstration, most users handled the interaction smoothly. Most followed the expected pattern of doing wide motions that are easily detected.
- A few users somehow managed to reverse engineer our slight-of-hand and understood that the wide motions were unnecessary. Hence, to move left, they just kept the right hand static at the left side of the body. To pan twice, for instance, they just put it and kept it there instead of doing two individual swiping motions at each character.

- The *existence* of interaction prompted the user's expectations for *constant* interaction. Some users were disappointed that there was no interaction during the short films of each character (apart from the cancelling motions). One especially enthusiastic user insisted on dancing along with the actress in the final short film, clearly expecting this to cause some reaction from the software.
- As we expected, a long line formed outside the tent, since the interaction was single user only. To deal with this we had a second tent that displayed the non-interactive version of the film, so that spectators of the main installation would only sample the interactivity and not watch the full film, thus speeding up the line. The crossing hands gesture could be used to stop the viewing of each film midway —crossing and uncrossing the hands making the film jump to its last three seconds.
- We found the crossing hands gesture to have a problem —some users would tend to cross arms (and hence hands) distractedly while watching the films, which would finish the film in an undesired way.
- Some users would get too close or too far from the ideal position in front of the Kinect, which would make motion detection less effective.

From these observations we made the following changes to version 2, displayed at Olhão, Portugal:

In version 2 of the program (shown at Olhão) we had better hardware to deal with the Kinect, and had also optimized the videos to eliminate glitches on changing direction of play, so we changed the finite state machine, to accept user input also during the panning motion. This catered to the user's need for constant interaction. The commands for panning left or right now are active during the panning movement itself; this allows the user to switch his or her mind mid movement and invert the panning direction at anytime, or hurriedly give a command to continue moving past a character without stopping the panning motion.

This made the interaction more fluid than before, eliminating user's frustration with accidental commands. By version 3, presented at Artech 2019,

perhaps because this motion detection had been optimized and made more fluid, it also had a curious side-effect, as some users found it amusing to play a sort of ping-pong with the film, by moving each hand in turn in a swatting motion, as if passing a ball from one hand to another, to watch the camera pan under their will. This is as interesting effect, showing how delighted users are at finding new unintended interactions, a pleasure akin to that of young children still discovering the interactions between their limbs and the world. This however took them away from the intended purpose, and risked turning the film into an exercise in digital calisthenics, in another example of how one must be very careful not to let the addiction of digital interaction too much free rein. At the same time, it makes us wonder how far we may take such movement discovery in a direction that may further the work itself.

We also changed the crossing hands input, demanding that the hands should cross above the head, thus eliminating undesired activations. This required a change to the detection of the individual raised hands motions (otherwise, each individual hand raising to do the crossing motion would be misinterpreted as a command in itself), in this way: an individual raised hand motion only counts if the opposite hand is at rest (within some parameters). This eliminated all accidental activations. Though one can conceive of exceptions, these were never once seen in the field, as they are mostly contrived motions that don't naturally occur.

At the Olhão presentation we opted to fix the distance of the user to the Kinect sensor by placing a chair at the optimal detection point. An unexpected result was that more people seemed to guess that they could make a continuous pan by just keeping the arm pointed to one direction instead of doing the repeated swiping motions. This is probably because the sitting position of the body is an incentive to static positions of the arms. Another unexpected result was that one person moved the chair from the intended position —as her eyes had trouble focusing at that distance— and then in her preferred position

she had trouble being detected by the Kinect (the solution being to stand up as in the original presentation). One must think of the atypical user. Another such example is that especially short or especially tall users could have some motions not as well detected as an average height user.

LESSONS LEARNED FROM THE RECEPTION OF THE WORK

Apart from minor technical aspects, the main lesson we take from these two presentations of the work is that the existence of an interactive aspect to the film tends to make that aspect dominant, and cause a dash of expectations if it doesn't pervade the whole artifact. Hence, such interactive aspects must be handled with extreme care so as not to hinder the fruition of the film as an object of art. This is however a common danger in all media that mixes multiple arts —think of operatic works, where librettist and composer, scenery and costume so often compete for attention rather than truly blend into a powerful whole. Potency of effect comes not as easily from blending the strength of multiple

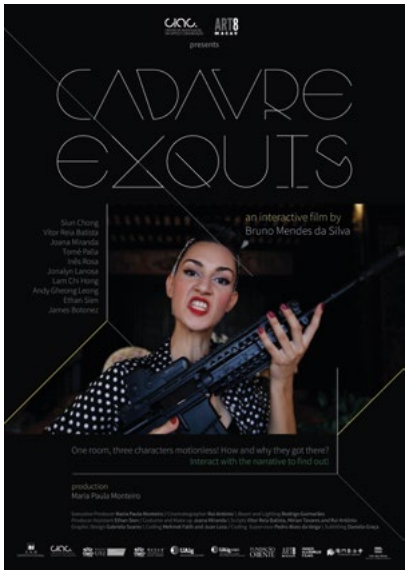

Figure 5. Poster of the film.

aspects but from the singular focus on a single one and a ruthless submission of all others to a supporting role. The main lessons of art seldom change, even as they take new forms.

CONCLUSION

We can hardly consider *Cadavre Exquis* as a direct descendant of the Surrealist Movement. Even because, as we said, the movement had a birth and death date, but its spirit, and above all its aesthetics, remain in many creations and creators. The whole pre-production, production and post-production process of a film is necessarily rationalized and planned in detail, thus apparently being an antipode to surrealist techniques. If we take the principle of automatism literally, no film could be considered Surrealistic, but if we believe Jean Cocteau's statement that all cinema is surreal, we can say that our project belongs to a surrealist poetics and aesthetics.

We intend to come closer to the idea of surrealist film through a collective and, in a way, unconscious process of script creation. As mentioned in the introduction, three scriptwriters were invited to create three narratives based on a character who, at the end of the narrative would meet two other characters in a room. The scripts would form a succession of sub-narratives which, just as in the *Cadavre Exquis* game, converge in the main narrative, eventually ending up in a succession of unlikely scenes. A common opening scene would be added: the scene of the three characters in the same room.

It is hereby intended a connection to the idea of automatism and to the processes that govern the unconscious: dream-condensation and dream-displacement are not perceived at the time they occur; while we are dreaming we are not aware of the process.

The very idea of film interactivity may be regarded as an intolerable artificiality, but, at the same time, as a catalyst to the idea of collective creation, due not only to the possibility of coauthorship offered to the viewer, but also to the freedom he/she is given to deconstruct the filmic structure at any time.

Actually, the idea of *Cadavre Exquis* as unconscious associations of collective ideas, free of a pre-established order, imputes a certain subversion of the conventional filmic discourse to the interactive film. However, the question remains, whether or not there was, in fact, a pure surrealist technique in all surrealist art forms. Breton himself recognizes how hard it is to reach the second states so desired by the surrealists. Truly automatic writing, games, or art in general was a utopia. With temporal distance in mind, Breton makes very lucid reflections that prove the impossibility of allowing himself to be totally controlled by automatism in the act of creation. He also acknowledges that even those who used the above-mentioned techniques to produce a poem later selected the passages they considered to be the most literary accurate.

The fascination with the question of time and its possible relations with cinema, interactive cinema, and literature is the matrix of the mother project *The Forking Paths*. The psychosomatic processes that can grant us different sensations and, consequently, different perceptions regarding their passage acquire, in cinema (and in their relation with interactivity), a potential for eminent experimentation.

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