Signals in Time and Space: A Submerged Media Avant-gardist Attempt on Environmental Design

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Abstract:

In the late 1960s, New York environmental psychologist, inventor and artist Serge Boutourline proposed a signal-oriented approach for describing the interdependencies and interactions between the individual and the environment. Key to his conceptual framework was the recognition of the changing character of natural and human-made environments and the consideration of such environments as a matrix of events in a four-dimensional time-space continuum. His fragmented and largely neglected theoretical and artistic sketches mark a radical departure from common theoretical positions related to the 1960s emerging discourse on Environmental Design.

Boutourline's conceptual approach reverberated central ideas of Whitehead's process philosophy, Wiener's *Cybernetics*, Bertalanffy's *General System Theory,* and McLuhan's media theory. It emerged out of his ground-breaking 1962 research on audience behaviour in public spaces. It took inspiration from his professional practice and collaboration in artistic projects informed by Schlemmer and Moholy-Nagy's concepts of modernist theatre, Alwin Nikolais' late-modernist abstract dance performances, and the 1960s countercultural avant-gardist experiments with media technology and human-machine communication in artistic practice. However, despite Boutourline's acquaintance to key figures in the 1960s discourse on technological media, artistic practice, and the academic field of Environmental Psychology, there is hardly any reference to Boutourline in the critical discourse concerned with the development of art and media in the 1960s.

This paper re-introduces Boutourline's signal oriented conceptual framework and technological device within the context of the 1960s countercultural avant-gardist experiments with human-machine communication. It further discusses the conceptual influence of theories and practices in dance and theatre

developed at the Bauhaus on the emerging avant-gardist performative and interactive art scene during the1960s in New York.

1. Introduction

In a 1967 letter to media theorist Marshall McLuhan, cultural anthropologist Edward T. Hall wrote about a meeting with Serge Boutourline in New York. Boutourline presented a device "which gives immediate visual feedback of kinesthetic responses to music", and that facilitated "very quick audience participation" (Hall Papers 1961-1977, 05.07.1967)[1]. Hall's description of Boutourline's 'gadget' carried remarkable parallels to what are commonly considered as computer-based interactive art environments, which emerged only in the early 1970s. However, neither Boutourline's name nor his technological device is mentioned in the seminal publications concerned with the development of media art. The presentation of an advanced technological device to a renowned cultural anthropologist had gone unnoticed even though it was part of a correspondence involving the leading media theorist of the time. Nonetheless, Boutourline developed a theoretical framework loosely related to Environmental Psychology that resonated with some of the principal philosophical and technological discourses of the 1960s. His iridescent theoretical and artistic sketches contributed to the development of interactive media art performances and carried surprising links to modernist concepts related to performative spaces developed at the Bauhaus. They also evidence the conceptual influence of theories and practices in dance and theatre developed at the Bauhaus in the 1920s on the emerging avant-gardist performative and interactive art scene during the1960s in New York[2].

2. Phantom of the Signals

Serge Boutourline was a Harvard Business Administration graduate, inventor, environmental psychologist, artist, and founder of *Interaction Signal*, a New York registered company concerned with the design of responsive environments and analogue electronic interactive devices. In 1962, Boutourline co-authored a pioneering study in audience behaviour in public exhibitions and trade fairs commissioned by the IBM Communications Research Office (Weiss and Boutourline 1962)[3]. During the mid-1960s, Boutourline worked for IBM as

consultant, behavioural psychologist, and ergonomist (Harwood 2011, 197). In 1967, his company *Interaction Signal* invented and built *Videosketch*, the electronic device that Hall mentioned to McLuhan. During the second half of the 1960s, Boutourline developed his signal-oriented environmental approach (Boutourline Papers 1962-1971), appeared for a short time in the New York avantgarde art scene, and published at the end of the 1960s in the context of the emerging academic field of environmental psychology (Boutourline 1966) (Boutourline 1968a)[4]. In the early 1970s, Boutourline ended his engagement with art, technology, and academia.

3. A Grammar of Experience

Around 1964, Boutourline sent Hall a 30 pages long transcript of recorded audiotapes, in which he commented and expanded on the research findings at the Seattle Expo (Boutourline 1964). As probably the most important conclusion of the rather lengthy draft, Boutourline proposed the development of a 'grammar of experience' with its own 'logic, syntax, and rules'. According to Boutourline, this grammar should be concerned with "the problem of engaging, involving, and disengaging people from an experience" and with the "essential role that the individual's participation has" (Boutourline 1964, 28). As the objective and intended outcome of his research, Boutourline indicated nothing less than the articulation of a "satisfactory general theory of environment", as he announced to Hall in a 1964 letter. To achieve this, Boutourline proposed a critical evaluation of "two formulations of reality" in physics that "persist within the social and architectural science to this day". He defined these formulations as the assumption of "the existence of an objective reality", and the assumption of "the separation of the 'subject' and the 'object'". Boutourline stressed that these formulations could describe neither the environment nor any observable interrelationship between the individual and the environment (Boutourline Papers 1962-1971, 09.01.1964). In a 1967 letter to Hall, Boutourline further explained his conceptual approach as a framework to describe the interrelation between people and other physical objects in a time-space matrix of events. This proposed framework resolutely rejected the Newtonian object reality. Instead, it defined both human and physical objects in the environment as "sets of points each with a set of occurrences or events" happening at a specific

location, and captured in an "event language" (Boutourline Papers 1962-1971,17.10.1967). In a 1968 unpublished interview with Jud Yalkut, Boutourline explicated further on his framework. He described the three-dimensional space as a matrix comprising of subsets of unique physical events or signals occurring at that location, including "light, electrical signals, magnetic-electrostatic, sound, chemical particles in the air" (Yalkut 1984, 11f). however, there is no evidence that Boutourline indeed developed the proposed grammar of experience or a general theory of environment.

4. Processes and Systems

Boutourline's conceptual framework describes a complex system of non-object event 'points' in a time-space matrix that are embedded in a state of constant communication through signals. Consequently, everyone who immerses into any environment would design his or her very own individual environment. In essence, it defined a system of multiple, co-existent, discreet though interrelated environments constantly created through human action in space and time. The rejection of the Newtonian object reality in favour of a concept based on the assumption that infinite individualised environments would create the observable environment marks a rather radical departure from common theoretical positions related to environmental concerns at the time. The emerging discourses related to environmental psychology and environmental design in the1960s still presupposed the existence of an environment that remained, although relational and complex, in a singular state that allowed for the evaluation of the environment, and the definition and the design of interactions or responses. Boutourline's signal approach, in contrast, carried strong references to the concept of multiple universes, introduced by Schrödinger just about ten years earlier. It also resonates with some of the dominant discourses of the 1960s and amalgamates some of their key concepts. Among them are Hall and McLuhan, with whom Boutourline shares the focus on cybernetic principles that describe mutual interdependencies and feedback systems between the individual and the environment. Furthermore, conceptual references are apparent towards Alfred North Whitehead's 1920s process philosophy (Whitehead 1929), Norbert Wiener's 1948 *Cybernetics* (Wiener 1948), and Ludwig von Bertalanffy's 1968 *General System Theory*

(Bertalanffy 1968)[5]. While Boutourline's signal approach bears references to all of these theories, he certainly has no exclusivity on any of these in particular. Systems and processes were omnipresent in the 1960s and referenced by many artists and art collectives. However, it was Boutourline's rather iridescent amalgamation of these discourses that resulted in his rather radical postulations.

5. Bauhaus & Nikolais

Beyond all these theoretical and philosophical references, Boutourline's complex environmental framework of signals in a space-time matrix bears surprising similarities to modernist concepts related to performative spaces developed at the Bauhaus. Oskar Schlemmer's sketch of "the invisible linear network of planimetric and stereometric relationships" that define the laws of cubical space could almost serve as a visualisation of Boutourline's signal framework (Schlemmer 1961, 23). While there is no direct indication in the still available documents whether Boutourline drew inspiration from the Bauhaus, it is rather unlikely that he was entirely unaware about these references to theories and practices in dance and theatre developed at the Bauhaus. During the mid-1960s, when he articulated his signal-oriented approach and created technologies in support of his framework, he collaborated with dancer and choreographer Susan Buirge. Buirge launched her career in New York in 1963 as a dancer with Alwin Nikolais, a key figure in American modern dance renowned for his modernist approach to dance performance, and the inclusion of state-of-the-art sound, light and image technology on stage. His performances created a visual theatre that celebrated pure motional aesthetics. Nikolais' links to artistic and theoretical ideas on theatre and dance developed at the Bauhaus are evident and emphasised by many scholars. Among them Marcia Siegel, a renowned dance critic who started writing about dance in the early 1960s. In her article *Artisans of Space*, Siegel discusses developments in dance form and attempts to unify technology with arts and crafts at the Bauhaus in relation to Alwin Nikolais and emphasises particularly conceptual links to Schlemmer and Laban. Siegel notes that Nikolais inherited the conceptual approach towards theatrical methods from Schlemmer, towards movement from Laban, and towards performative structure from Constructivists. She concluded

that Nikolais continued the journey into the territory of "space dance" laid out by Schlemmer to create a "technical organism" in the fabricated stage environment (Siegel 2007, 61). As such, one is tempted to say that Nikolais extended ideas developed at the Bauhaus into late modernist dance theatre and realised conceptual approaches that could not be resolved in the 1920s due to technological constraints. Certainly, in this context, Moholy-Nagy's "Theatre of Totality" should also be mentioned and his demand to create an "organism" fabricated from "multifarious complexities of light, space, plane, form, motion, sound, man". Also, his proposition to "no longer permit the masses to be silent spectators" but "let them take hold [and] fuse with the action on the stage" already points to concepts of audience participation and interaction (Moholy-Nagy 1961, 68).

 Videosketch

This smorgasbord of theoretical, philosophical, mathematical, and practical references became the blueprint for Boutourline's artistic activities at the end of the 1960s. By then, he had founded *Interaction Signal,* a company concerned with the design of responsive environments and analogue electronic interactive devices, and immersed himself in the New York underground art scene. Among the tools that his company invented and built around 1967 was *Videosketch*.

   Videosketch was a cabinet-sized black console with a TV monitor on top, and a television camera placed at the height of about one meter facing the participant. The participant performed with five small light bulbs attached to hands, ankles and head about two to three meters in front of the device. The live camera signal was electronically manipulated to display trails of the lights' movement on the monitor. The device provided real-time control of a range of variations of these white calligraphic designs in size, pattern, and luminosity, and the length of time before these light-trails faded out. *Videosketch* introduced a playful interrelation between reality and mediated representation. The visual representation of the participant's movements on the television screen constituted a mediated abstraction of movement in space in real-time. It introduced a unique visual language and grammar for this mediated representation, described as "blobs, squiggles, fat and thin lines" (Jowitt 1968) that were received by the device's "electronic eye or radar" (Siegel 1968). This

'virtual' representation assumed independence from its source in reality, which, in essence, constituted a technologically informed mixed-reality environment[6].

In January 1968, Boutourline introduced *Videosketch* in a letter to Paul Libin, Broadway Impresario and at the time Director of the Martinique Theatre. Boutourline announced the device as a "television-assisted medium for art expression", and "as a medium for communication past speech", and highlighted its cultural and political features, as it "takes technology out of the hand of managers, and puts it in the hands of people". It would further enable individuals to "manage their own environment". Boutourline envisioned Videosketch as a "reintegrator" suitable for deployment in psychiatry, and a "significant advance in therapeutic methodology". He also introduced it as a "new, performer-centered medium" that provides an "expanded and instantaneous extension" of dancers and actors (Boutourline 1968c). The emphasis on interdependencies between the individual and the broader cultural environment reflects Boutourline's 'signal-oriented' approach to environmental management. It also established a proof of concept in support of his theoretical framework. Although, interestingly, his description fell short of emphasising the key attributes of his device: The visualisation of the invisible interactions between human and environment through signals send and received by participants in a complex open system. Furthermore, through the process of interaction, the possibility to control, or manage, the created environment. In other words: He fabricated an analogue interactive computer device that defined, and to some degree, created a user controlled artificial reality.

6. Televanilla

The artistic references to Nikolais and Bauhaus also led to an actual dance performance conceived by Boutourline and Buirge. *Televanilla* was shown in the Martinique Theatre in June 1968. *Videosketch* appeared here in public for the second and last time. Televanilla was a one-night event introduced in the evening's program as an "improvisational theatre dance piece" (Boutourline 1968b). Within the next two months, *Televanilla* received four reviews from renowned critics in reputable publications (Anderson 1968) (Jowitt 1968) (Maskey 1968) (Siegel 1968). The performance presents a fascinating example of the transformation of the concept of audience participation in performance art

into the notion of technology-based human-machine interaction with an analogue electronic device. Although *Televanilla* made only a very tentative approach to expanding the concept of interactivity beyond the boundaries of the stage, it can be considered it as one of the first dance performances that created an interactive mixed-reality environment. It re-emphasises that the conceptual roots for interactive human-machine interfaces trace back to performance art practices in that time. Moreover, it exemplifies the influence of the Bauhaus in the 1960s emerging avant-gardist performative and interactive art scene. However, it disappeared from the historical records for the best part of half a century shortly after its debut[7].

7. Conclusion

The relevance of Boutourline's fragmented, unfinished, and iridescent arguments related to a signal-oriented, non-Newtonian, system-theoretical definition of environments in the 1960s theoretical discourses was marginal at best. His concepts and practices based on event and system theory left no noticeable trace in the critical discourse concerned with the development of art and environments in the 1960s.

However, Boutourline's amalgamation of a broad array of theoretical frameworks from various discourses and artistic practices resulted in a radical approach towards a postmodern understanding of the interdependencies between human and the environment. It combined concepts from environmental design and environmental psychology with modernist stage-concepts, late-modernist media concepts, and avant-gardist art concepts. His approach was informed by an acute understanding of technological concepts for artificial and virtual environments, and not only emphasized audience participation, but transformed the notion of participation into the concept of human agency.

His ideas might have been radical and unpolished at the time. However, half a decade later, at in a time when more and more parts of our formerly analogue life have been transferred into digital worlds, his description of the environment as sets of events in a time-space matrix might deserve some attention in the discussion of artificial and virtual reality environments in the age of big data.

Acknowledgements

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11. Endnotes

[1] Starting in 1961, cultural anthropologist Edward T. Hall and media theorist Marshall McLuhan embarked on an extensive correspondence consisting of more than 130 letters and spanning more than 15 years (Hall Papers 1961-1977) (McLuhan Papers 1963-1977). Although the number of letters accounts for both Hall's and McLuhan's largest correspondence with a single person, outnumbered only by McLuhan's letters to his mother (Rogers 2000), this compendium of thoughtful discussions on a large variety of topics undertaken predominantly during the 1960s has not received much attention. Edward T. Hall was the author of the seminal, and highly successful, 1959 publication *The Silent Language*, the founding document of Intercultural Communications (Hall 1959). His research was concerned with the interdependencies between different cultural environments, human perception, and behaviour. McLuhan dominated the 1960s discourse on media and communication technologies and their effects on human culture and society in late capitalism after the publication of *Understanding Media* (McLuhan 1964). His ability to use the emerging media environment in favour of his contested ideas transformed him from a "cultural dialectic" into a celebrity brand name (Marchessault 2005, 110). References to the Hall correspondence archived at the UAL are used with kind permission of Karin B. Hall, Executor of the Edward T. Hall Estate. Any re-publication of those references requires permission from the copyright owner.

[2] The author is greatly indebted to Susan Buirge for providing extraordinarily fascinating information about the late 1960s dance and performance art scene in New York in general, and about Serge Boutourline, *Videosketch* and *Televanilla* in particular.

[3] The report entitled *Fairs, Exhibits, Pavilions, and their Audiences* presented a novel, qualitative approach to the study of visitor behaviour in public exhibition spaces and constitutes one of the earliest examples of a systematic analysis of audience behaviour in public space, exhibitions and trade fairs, undertaken predominantly at the Seattle World Fair 1962. It analysed in detail visitors' movements between and inside the exhibition spaces, the time they spent on different exhibits, how audiences responded to various exhibits in specific environmental settings, and their immediate and long-term reactions to the exhibition environment, as the authors stated in the preface of the report (Weiss and Boutourline 1962).

[4] Harold Proshansky defined this sub-field of psychology "as the science that studies the interactions and relationships between people and their environments". It promoted a discourse

in which "neither the individual nor the environment" but the "interactions and relationships between the two" constituted the relevant "unit of analysis" (Proshansky 1990, 22).

[5] Wiener' *Cybernetics* and Bertalanffy's *General System Theory* describe social, biological and mechanical environments as interdependent, self-regulating systems governed by structures of control and communication. Whitehead's process philosophy proposes that every real-life object may be understood as a series of events and processes. The interdependencies between different elements of such a complex system composed of minuscule "processes" would generate what we perceive as "observable substances" (Barker 2012, 4f). Whitehead concluded that "all things flow" (Whitehead 1978, 317).

[6] Boutourline first presented the device to the public in the 1967 show *Festival of Lights* at the Howard Wise Gallery in New York alongside Otto Piene, Nam June Paik, Jack Burnham, Gunther Uecker, and Aldo Tambellini, to name only a few (Wise 1967). Interestingly, neither the artwork nor the technological device is mentioned in the exhibition reviews. Buirge recalls that she was improvising with *Videosketch* during the opening of the show. Buirge further remembers: "*People seemed interested, nothing ecstatic*" (Susan Buirge, Email to author, September 21, 2016)

[7] In early 2020, a detailed account of Televanilla is expected to be published in the Proceedings of RE:SOUND, the 8th International Conference on the Histories of Media Arts 2019, Aalborg.