School of Arts, Technology, and Emerging Communication

Dream Architectonics: An Interactive Audiovisual Installation

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ABSTRACT

This article presents the processes that guided the production of the interactive artwork *DreamArchitectonics*, attempting to render perceivable the altered experience of time characteristic of the dream-state. This project originated with the observation of dream reports that were revealed, across a broad variety of contents, to be relatively invariant in form, with this form appearing to function as a mnemonic artifact allowing the dreamer to actually remember dreams. The details of the representational process applied to oneiric time and manifested in these artifacts have been identified to resonate meaningfully with poetic expression, especially in its relationship to the sensation of movement. *DreamArchitectonics* aims at producing the context for an experiential synthesis of this intuition and acting as the generator of phenomenological data in a disposition that the authors envision as the most fruitful for collaboration between arts and sciences.

DreamArchitectonics [1] is an interactive audiovisual installation exhibited at Dallas Contemporary in 2014 (Fig. 1) and presented by the authors as the artist duo Agence5970. This installation aims to infuse into the space of its presentation a state of reverie or meditation favorable to the exploration of the memories of dreams.

DreamArchitectonics is part of ongoing research conducted by Agence5970 addressing the questions of perception and representation of time. Within this endeavor, dreams represented a very intriguing field of investigation in which time appeared to be experienced in a paradoxical manner, both similar to an awakened state and yet very different because of the absence of actual movement of the body and lack of awareness of the environment. Time in this context appears as a pure time, separated from its spatial projection and, in this sense, is very close to the manifestation of what Bergson terms "duration" [2].

Preliminary phenomenological investigations of the sen-

sation of time in dreams have oriented our effort toward an experience of time appearing to flow vertically along a percolation of movements through multiple layers instead of passing horizontally along a succession of events.

This article aims at presenting the conceptual processes leading to the realization of the artwork.

DESCRIPTION OF THE ARTWORK

In the presentation of our work, the preliminary phase of interaction with the system consists of an immersion into the state of reverie: a space delimited with sound-absorbent panels where an aerial active noise cancellation system [3] isolates the spectator in a bubble of quietness and a screen presents slowly moving images of air and water. On a lectern, a book contains poetic extracts selected by Gaston Bachelard as examples of poetic translations of dreams [4]. When read aloud by the interactant, the chosen text is analyzed according to the acoustic and temporal signature of the reader's voice, thus controlling the visual and musical output. The resulting audiovisual sequence is designed to reveal the structural connections among the images and movements suggested by the text.

THEORETICAL FRAMEWORK AND INSPIRATION

The departure of this work is the observation that a vast part of the scientific endeavor dedicated to the study of dreams focuses primarily on symbolic content and its interpretation from the perspective of the understanding of the regulatory function of dreams and their relationship to physiological states.

Dreams and their contents have been a constant subject of interest and investigation, poetic as well as scientific. Sigmund Freud, in *The Interpretation of Dreams* [5], analyzes the abundant literature dedicated to this topic, from early Greek philosophers to contemporaneous scientists, only to reveal the consistency of the search for meanings and relationships between dreams, reality and memory. The many modes of exchange between distant and recently past events and the present constitute the framework for the interpretation of

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contents. Even if Freud suggests that the "behavior of memory in dreams could significantly contribute to any theory of memory whatsoever" [6], the question of the linkage between memory and dreams is only addressed through the analysis of unquestioned data: dream narrations. Jung's description of the dramatic structure of dreams, with four archetypal stages—exposition, development, culmination and lysis—mainly addresses coarse articulations of large narrative units and their functions without considering the process of linguistic formation of these units [7]. While Freud and the subsequent generations of psychoanalysts extensively discuss these text-mediated modes of exchange, it is only with Jacques Lacan's famous insight that "the structure of language which enables us to read dreams is the very principle of the 'meaning of dreams,' the *Traumdeutung*" [8], that the linguistic nature of this exchange is clearly identified and questioned. However, the "structuralization" of psychoanalysis proposed by Lacan only applies to the symbolic dimension of contents, in the search for new means of textual interpretation. The question of the linguistic process of the formation of such content, as well the phenomenological experience of time in dreams partially encoded in its textual translation, is still not addressed.

More recent research in psychology and neuroscience is primarily concerned with the relationship of the dream state with physiological states. Since the early 1950s, phases of rapid eye movement during sleep are known to be associated with oneiric activity [9], allowing further studies to compare the actual duration of a dream to its narrative content and to envision the temporal processing of dreams. Unfortunately, a clear methodological and disciplinary divide between the cognitive approach, seeking a relationship between dream contents and life, and the physiological approach, dealing with the neurological system and its behavior during dream state, has not allowed for this vision to arise.

Recently, William Domhoff presented a coherent multidisciplinary framework for the study of dream contents, combining various methods of collection and of analysis [10]. In particular, the use of the Hall/Van Castle system of quantitative dream content analysis [11] brings a great deal of information about narrative content and limited aspects of the structure of dreams. Within this system, dream reports are analyzed in categories such as characters, activities, settings, objects or temporal references. This neurocognitive approach clearly proposes new ways of understanding meanings and forms of dreams without directly addressing the lived experience of dreams sought by our phenomenological inquiry on the intimate and unique relationship created by dreams between memory, language and experience of time.

Contemporary research in neurophysiology proposes a description or definition of the dream state as a paradoxical state in which the dreamer is conscious, disconnected from the environment and engaged in a mental activity by which the "brain is creating a story, filling it with actors and

Fig. 1. *DreamArchitectonics* installation at Dallas Contemporary, Dallas, Texas, October 2014. (© Frank Dufour. Photo © Lee Dufour.)

scenarios, and generating hallucinatory images" to generate sensory experiences very similar to those occurring in the waking state [12].

Yes, words really do dream.

—GASTON BACHELARD [13]

Our assumption is that the richness of these experiences could be captured from their narrations in a manner similar to the way poetry captures memories and the sensations of movements. The phenomenological ambition of our inquiry finds in Bachelard's works, notably in *The Poetics of Reverie*, *Water and Dreams* and *Air and Dreams* [14], its most substantial support: Bachelard proposes to use the patient observation of dreams, performed and documented by poets, for a deeper understanding of the human mind in general and of dreams in particular.

All the senses awaken and fall into harmony in poetic reverie. Poetic reverie listens to this polyphony of the senses, and the poetic consciousness must record it. The poetic image is suited to what Friedrich Schlegel said of language: it is spontaneous creation. It is such élans of the imagination which the phenomenologist of imagination must try to retrieve [15].

The text becomes the gateway to memory of dreams, themselves analyzed as texts in search of their grammatical and temporal organization, thus rendering perceivable the structure of oneiric time.

The study of this underlying organization of time, or its architectonics, has been performed within two theoretical frameworks:

- Chronogenesis, the term coined by Gustave Guillaume to describe the process of formation of textual images of time, has been applied to the analysis of narrations of dreams.
- The system of Semiotic Temporal Units (STU) developed by the laboratory Musique et Informatique de Marseille (MIM) to capture the phenomenological

dimension of music perception has been applied to the analysis of poems evocative of dreams and to the synthesis of musical and visual sequences.

These principles of analysis are nested within Gaston Bachelard's study of poetic evocation of dreams, used to unify the proposed symbolic and conceptual universe of the installation and of its imagery.

There is an abundant tradition of translation of dreams into images and narratives, parallel to their interpretation. An important phase in this tradition occurs at the beginning of the twentieth century with the concurrent availability of cinema and Freud's theories inspiring the creation of new artistic representations of dreams aiming to mimic dreams both in terms of narrative succession and symbolic imagery. The 1928 film by Germaine Dulac, *The Seashell and the Clergyman* [16], is exemplary of such ambition. The film is chiefly remarkable and memorable in its use of "disruptive temporal structures that unfold with the fabric of a dream" [17]. The film is more than a juxtaposition of symbolic images and presents the spectator with an experience of time similar to the memory of a dream: mainly organized by long sequences based on the permanence of one single action confined in a given space. The film feels like a dream as much as it looks like a dream. Cinema is the medium of choice for translation of dreams; however, this rich creative activity is most always centered on oneiric imagery directly benefiting from technological advancements to naturalize the appearance of phantasmagoric images. Experimental films actually seeking the simulation of the dream experience inspire the present work, in particular, the works of Cocteau, Bunuel, Tarkovsky and Wim Wenders. The latter's film *Until the End of the World* [18] marks a meaningful shift in the history of cinematic representations of dreams by embedding at the core of the story a device meant to record and to share dreams directly from brainwaves, without the necessity of linguistic mediation.

Interactive art and installation art have allowed explorations of dream processes, as in the work of Ben Bogart, whose goal is to "explore the underlying mechanisms that cause dreams in the service of an image-generating process" [19].

Artists like Bill Viola, who in *Tiny Deaths* [20] presents the spectator with appearances and illusions of movement and stillness, evocative of the movement of the dream-image in the process of its remembering, are particular sources of inspiration for our work.

CHRONOGENESIS

One of the paradoxes of time is its undisputed reality coupled with the inability to directly seize this reality other than by means of altered perceptions and a willingness to question recursively such experiences. Our starting points are narrations of dream experiences and the linguistic inventions, images and metaphors created to question, articulate and possibly resolve the question of time. We assume that it is on this dual path, going from the experiences to their descriptions and then from representations back to experiences, that can be encountered the boldest advances of thought and the most commonly shared intuitions. The many ways in which artistic expressions immerse us in temporal experiences, supported by different forms of representation, constitute a large domain of investigation and experimentation about this particular duality of time. Film, music, interactive art, installations, stories or any time-based artistic expression allow us to intuitively seize two dimensions of time. Bergson opposes these dimensions as pure duration, or heterogeneous time, being "the form which the succession of our conscious state assumes when our ego lets itself live, when it refrains from separating its present state from its former states" [21], and homogeneous time, which is time represented and conceptualized on the basis of its spatial projection.

We will address this duality of time by presenting the trajectories from one to another. The immediate aspects of time that are the past, present and future are related to these two radically different dimensions: Pure duration is the dimension of the experienced present, the sensation of duration and the plasticity of time elapsing. Homogeneous time is the dimension of the knowledge of the past and anticipation of the future.

DreamArchitectonics considers dreams as an eminently paradoxical system of representation in which the sensation of the present and of its duration far exceeds, in terms of experience, the semantic framework of its homogeneous narrative representation. This contrasting dialogue between the temporal impression experienced during the dream state and its narration is the characteristic of dreams that we aimed to explore, with the goal to understand how the perceived duration or temporality of dream was encoded in the text of its narration. We identified Gustave Guillaume's framework of Chronogenesis [22] as the most relevant framework for this analysis.

Guillaume intends to identify and describe the process of formation of the image of time in language. This process, a movement from the "virtual" language to its actualization, is what Guillaume terms Chronogenesis. The virtual language represents for Guillaume the state of the thought prior to its linguistic formalization. In this heterogeneous dimension, all actions, ideas and sensations are present with their own and unique duration: They are, as Guillaume puts it, "unsayable." To become "sayable," they must be actualized and encoded through the system of homogeneous units constituted by an actual language. In this process, their unique temporal extension, or duration, is encoded by the verbs. The verbs have the ability to express time and its variability by the choice of modes, aspects and tenses that extend the possibility of representation onto a broader horizon than the single chronological line. According to Guillaume, the system of verbs encodes information not only about the position of events in time but also about their state of accomplishment and duration. The reader or listener will in turn reinterpret the encoded duration manifested by the "said" as a new experienced duration. This view is particularly relevant to our project because it allows us to seize from the close observation of the use of verbs in dream narrations the type and quality of movements the narrators attempted to describe.

ANALYSIS OF DREAM NARRATIONS

The formative power of the materials furnished to the dream by the different senses, the power which converts into precise, determined objects the vague and indistinct sensations that the dreamer receives from his eyes, his ears, and the whole surface and interior of his body, is the memory [23].

The corpus for this first section of our research has been constituted by the collection of dream narrations from multiple sources dedicated to the study of dreams. One of these sources is the Dream Bank [24], the website developed by Schneider and Domhoff in support of the quantitative analysis of dream contents. The other sources were websites dedicated to the analysis of symbolic contents of dreams where users upload their narrations of dreams with the hope to receive psychoanalytic feedback, as well as firsthand accounts. While the modes of collections greatly differ in these two sources, one being scientifically controlled and the other being spontaneous, a close observation of the materials obtained from these sources did not reveal important differences in the form or content of the material, thus allowing us to use these sources indifferently.

Using Laurence Anthony's concordance tool AntConc, we analyzed these texts to identify their structure, particularly with regard to verbal forms and temporal organization. One significant element of information about the average length of narration of dreams, revealed through the analysis of a set of 1,700 dreams, is the relative brevity of these stories (300 words). The few (85) longer texts could be divided into two categories: descriptions of locations with abundance of details and detailed descriptions of complex successions of actions.

The most obvious finding about the structure of these texts is the overwhelming presence of the first-person subject, with 31,295 occurrences, while the combined score of all the other subjects (you, he, she, they) amounts to 19,311. The use of a first name or a generic term for a third-person subject (person, man, woman) is marginal and accounts only for a few hundred instances. Not surprisingly, dream narrations center on the actions performed by the dreamer.

Looking at the tenses of the verbs associated with the subject "I," it appears that past and present tenses are equally used, most frequently in the continuous or progressive aspect, indicating that the actions described by these verbs are in flux or in progress and serve as the main temporal context for the other actions presented with a perfect aspect. The contextualization of all other actions within the course of the continuation of one movement, performed by the dreamer alone or in association with another character, appears to be the typical temporal organization of dreams. This organization is based not on opposition of tenses in perfect aspect, allowing for a clear differentiation between past, present and future supporting the alignment of events along a temporal line, but on the sole opposition of aspects, presenting continuous movements in alternation with accomplished events. This type of organization, displacing the point of enunciation together with the described action, produces a strong emphasis on the continuous present of the action and tends to give the sensation of an elongated action evocative of Bergsonian duration.

I was walking down the main street and a car stopped by my side. The man in the car was yelling at me.
. . .
We are in a pasture, outside of xxx, walking cautiously because of the mud. Birds are flying very close to us. One of them falls right in front of me and we cannot find it.
. . .
I am driving to work and feeling anxious because I am late. There is a strange sound in the engine and the dashboard is now all black.

We interpreted these findings as the signs of a general diminishing of the importance of structured homogeneous time typical of traditional narrative forms, where all actions and events are oriented toward a predetermined future and chained together by organized series of tension and relief. Instead, in dreams, time is continuously attached to the unfolding of action and flows only in the attachment to this action performed by the dreamer. This self-centered organization is also made obvious by the use of numerous spatial markers (in front, behind, above) most often associated with the object pronoun "me." This grammatical construct contributes to a representation of time and space mainly organized along a sensation of continuous movement unfolding in a unified space. In this construct, time appears not to run horizontally from one action to another but to percolate vertically along the continuation of a single movement. We translated this general representation of time in our work by the use of the presentation of elongated actions in slow motion and long cross-fades from one video clip to another to simulate this fluid continuity of space and time.

The concordance analysis of these texts has also been used to identify the actions most commonly presented in dream narrations together with their associated adverbs in order to determine the types of shots to be included in *DreamArchitectonics*.

SEMIOTIC TEMPORAL UNITS

Processing and understanding of music rely primarily on the capacity of segmenting musical fluxes into units established upon permanence and variation of certain qualities or dimensions of sound. The dimensions usually considered in studies on music perception are pitch, intensity and, more rarely, timbre. These dimensions relate essentially to fine segmentation of the musical stream leading to the recognition of units that are not always immediately meaningful and perceivable in terms of appreciation of music. STUs are established on the basis of a coarse segmentation of musical streams spontaneously performed within the task of identifying units with duration in the range of 10 seconds and representing perceivable movements (moving forward, spinning, moving by waves . . .). As such, these units are categories of archetypes of movement to which segments of musical fluxes can be associated. The STUs form a system of phenomenological description of musical content, by which the stream

can be viewed as a succession of units, each of them associated with a sensation of movement.

In our research, we consider STUs as a system of mnemonic representation of movement that can be used to associate auditory segments from different musical or auditory contents and origins on the basis of the similarity of their temporal structure. For example, an STU such as Falling, presenting a temporal profile composed of two phases—the first, uniform with a suspension at a zenith, followed by a second, presenting a rapid downward movement of pitch—can be found in numerous musical examples as well as in speech patterns or natural acoustic events. This system of archetypal categorization, or formalizations of temporal structure of movements, allows the passage from a virtual or abstract representation of movement present in memory or in dream to its actualization in a media-specific form. Conversely, this system allows the passage from the actual presentation and perception of particular temporal profiles to the abstraction of these events in the form of a virtual image or category, inserting this perception into the memory of previous representations of similar temporal profiles.

The system of STUs has been used in *DreamArchitectonics* to support and formalize the bidirectional passages from the actual and particular to the virtual and abstract.

The selection of extracts of poems proposed to spectators as a means to interact with the system of *DreamArchitectonics* has been guided by the capacity of these texts to present evocations of movement similar to those experienced in dreams. The texts were first analyzed in terms of STUs according to their formal textual construction and to the expressive possibilities supported by this construction.

For example, the following extract has been analyzed as an STU of the Wave category: an undulating movement of crests and troughs in a cyclical pattern in which each cycle conveys the feeling of being pushed forward with a decreasing energy. The general feeling is that of steadiness.

Pious forest, shattered forest, where the dead are left lying,
Infinitely closed, dense with pinkish straight old stems,
Infinitely serried, older and grayed
On the vast, deep, mossy bed, a velvet cry [25].

The next example has been analyzed as an STU of the Compressive Expansion category: an uneven compression of sound followed by a uniform crescendo organized in two phases: that of a feeling of compression at first and then of uniform release of the energy through a crescendo.

Storm clouds—why should you be a concern for us, the free, the aerial, the joyous spirits? [26]

These extracts have then been read aloud, respecting the movement intentionality suggested by the STU associated to the text, recorded and submitted to digital processing to capture the acoustic parameters characteristic of the temporal profile. The number of peaks, average duration, dynamic range and variation of pitch have been measured with custom algorithms designed in Pure Data and built around Fast Fourier Transform objects. These sets of data are linked to each extract together with the category of STU and other characteristics of the poem relative to their symbolic content. This matrix of information embedded in the program of *DreamArchitectonics* is activated every time a spectator reads a poem: It compares the acoustic rendition of the text generated by the reader to the registered parameters of the text to identify deviations and similarities that are then used to generate the temporal structure of the audiovisual sequence proposed in response to the reader. The visual and musical contents shaped into this structure result from the fixed association of the symbolic content of the text to video clips and musical layers and patterns. The guiding principle in the generation of the audiovisual response is the search for a maximal resonance between the movement suggested by the text and the movement generated by the reader. This resonance operates as follows: When the STU of the text and the STU of the reading are identical, the response of the system is entirely established on this STU by pulling from a pool of audio clips representative of this particular unit. When the STUs are dissonant, the response of the system is established upon secondary qualities of the movement generated by the reader, such as force, duration, and tension, applied to a sound layer displaying a stationary musical ambience proportionally animated in intensity. Resonance between the input from the reader and the response of the system is also based on the recognition of the extract itself that directs the selection of video clips to be displayed to contain visual elements obviously present in the text. This set of perceivable syntonic adjustments of the system to its inputs contributes to the creation of a positive interactive experience in which the spectator has the capacity to recognize, even through the apparent strangeness of the visual and musical components, the familiarity of movements and temporal organizations archetypal of dreams.

CONCLUSION

The work *DreamArchitectonics* is dedicated to the exploration of dreams. The subject of dreams often opens to infinite expressive possibilities based on the common acceptance of the oddness of dream contents, leading to the production of easily intriguing, puzzling or surrealistic works. Refraining from systematic use of symbolic treatment or interpretation of these contents, *DreamArchitectonics* concentrates on the structure of the temporal organization of narrations of dreams, i.e. their architectonics, to propose an experience simulating the act of remembering a dream and progressively retrieving its images, movements and temporality. From the observation of interactants with the artwork and discussions organized in the museum during the exhibition of the work, it appears that *DreamArchitectonics* actually proposes a convincing experience of reconnection with the dream state. The frequency of comments on how much the interaction with the work "felt like" dreaming, much greater than the frequency of comments about the content of the work, validates the intuition and the method of *DreamArchitectonics* placing the formation of textual translations at the center of the process of remembering dreams and using the specific textuality of dream narrations as a means of retrieving their temporality. It is possible and scientifically reasonable

to consider *DreamArchitectonics* a valid way to reveal and make available phenomenological data about the experience of remembering dreams that could further inspire new scientific studies of dreams. It is in this disposition of generator of phenomenological data that we envision the most fruitful collaborations between arts and sciences. While it is not the purpose of this paper to propose a typology of such projects, we suggest that the modes of hybridization of the employed methodologies could constitute an efficient classification tool. In this context, one relevant class of collaboration between art and science implies the contribution of the artist to the research project with preliminary exploration of the research topic by means of experiential and qualitative approach. This approach, mainly centered on the perception of the object of research, defines its contour and prepares it for empirical investigations by identifying regions of meanings and values and underlying structural connections that can be further conceptualized as categories and relationships supporting different quantitative or qualitative inquiries. Looking back at *DreamArchitectonics* in particular, and at our work in general [27], we consider the approach consistently used to be a spontaneous and intuitive manifestation of this methodology that we intend to formalize in the application to the study of perception of time.

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