

WWW.LOVELYWEATHER.COM: A WEB-BASED INTERACTIVE AUDIO-VISUAL ENVIRONMENT

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ABSTRACT

www.lovelyweather.com is a web-based hypermedia work by Salman Bakht, Christopher Jette, and Alejandro Casazi. This work, part of a series called *LovelyWeather*, combines digital photographs with environmental audio recordings to form a virtual audio-visual space navigable by computer mouse. *www.lovelyweather.com* examines the relationship between the methods of navigation used in web-based media and the process of exploration that an artist and audience experience in the creation, presentation, and interpretation of an artwork. This paper describes navigational structure of the website and the methods used in the arrangement and processing of sounds and images.

1. INTRODUCTION

The participation in and perception of a piece of artwork is a multilayered process involving a network of relationships between the artist, the audience, the artwork, and the environment. *LovelyWeather* examines this set of relationships by presenting a series of works that represent the experience of nature exploration and meteorological phenomena as a metaphor for the artistic and perceptual process. Although these works share the same conceptual and metaphorical basis, they use an array of media elements including digital sound, sculpture, and video and are presented in environments ranging from a nature walk to the internet. As a result, the project highlights the distinct qualities of different artistic contexts.

This paper describes *www.lovelyweather.com*, the web-based component of *LovelyWeather*. The audio-visual content of the work is derived from a database of field recordings and digital photographs taken along a nature walk in the Ellwood Mesa area near Santa Barbara, California. These sounds and images are arranged and deployed as an interactive Flash animation. The software, written in ActionScript with Adobe Flex, is primarily intended for online viewing although it may also be presented on computers in an art exhibition setting.

www.lovelyweather.com and the project as a whole are inspired by several artistic and theoretical works. Musically, the work draws heavily from the field of soundscape composition. The works in *LovelyWeather* use

a variety of structural approaches to soundscape composition, similar to those used in the first three *Presque Rien* works by Luc Ferrari [4]. According to the classification described by Barry Truax in “Genres and Techniques of Soundscape Composition as Developed at Simon Fraser University,” *www.lovelyweather.com* uses a model of “variable spatial perspective emphasising a discontinuous space/time flow” to mirror “nonlinear mental experiences of memory recall, dreams, and free association” [7]. *www.lovelyweather.com* is also an example of an open form composition, with distinct sections (or nodes as described below) that are traversed in an order of the user’s choosing.

www.lovelyweather.com is also inspired by a number of interactive digital art works, most notably *fLOw*, a two-dimensional exploratory web-based game, by Jenova Chen [3] and *riverIsland*, a navigable work integrating digital poetry and morphing photography [2]. These works offered both references for web-based navigational methods and aesthetics. One objective of *LovelyWeather* is the exploration of the continuum between artistic representation and abstraction. This objective is inspired both by visual artist Wassily Kandinsky’s text *Concerning the Spiritual in Art*, which discusses the transition from representation to abstract art on both a historical level and the level of the individual artist [5], and by the electroacoustic art concept of categories of landscape morphology.

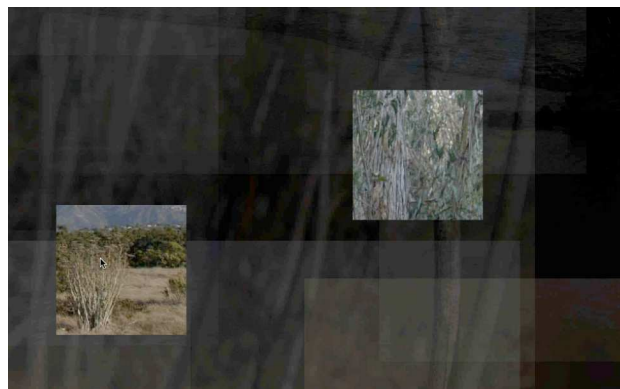


Figure 1. A screenshot from *www.lovelyweather.com*, root node with “field” and “forest” foreground images.



Figure 2. A screenshot from *www.lovelyweather.com*, “rock” node with “sand” foreground image.

2. OVERVIEW

On *www.lovelyweather.com*, the user is presented with a collage of environmental sounds and a rectangular frame containing a set of irregularly distributed images, as shown in Figures 1 and 2 above. Both the sound and visuals contain two layers: foreground and background. The larger *background images* overlap and blend with each other, while the smaller square *foreground images* are more distinct and sit in front of the background. The sound layers function similarly, with a set of distinct *foreground sound* “objects” played over a consistent although changing *background sound* “field.” The algorithms for sound and image arrangement and processing are described in Sections 4 and 5.

Moving the computer mouse cursor, the user navigates horizontally or vertically, similar to a camera’s pan and tilt, within a single virtual location, which is referred to herein as a *node*. This motion not only reveals different images but also modifies the audio content. Most noticeably, foreground sounds become more prominent as they come into view, while variation in panning provides spatial cues. After clicking on an image, the user is transported to a different location entirely as images and sounds are replaced and audio processing changes.

3. NAVIGATIONAL STRUCTURE

3.1. Navigation within a Node

The user navigates within a single location, or node, by moving the mouse cursor with the speed and direction of movement based on the distance of the cursor from the center of the frame. Emulating human vision or camera movement, the perspective pans 360 degrees moving in the horizontal direction, while vertical motion is limited and does not loop. In software, movement in a certain direction results in an equivalent shift of all images in the opposite direction.

3.2. Navigation between Nodes

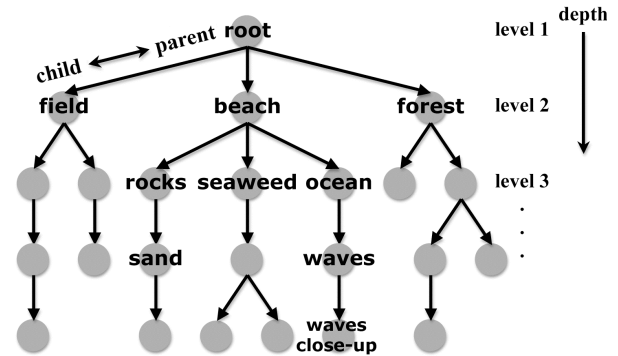


Figure 3. Organization of nodes (example only).

Nodes are organized in a directed tree structure as shown in the example in Figure 3. The *root node*, from which the screenshot in Figure 1 is taken, is the node that is loaded when the site is entered. To navigate to a child node (for example “field,” “beach,” and “forest” if the user is in the root node), the user clicks on one of the foreground images. There is always one foreground image for each child node. The foreground image corresponding to a child node contains a small section of a photograph from the collection of background images in the child image. In Figure 1, for example, the foreground image corresponding to the field node and forest node are seen. The *depth* of each node is the distance of the node from the root node, where the root node is defined as “level 1,” its children are defined as “level 2,” etc. The nodes with node children, referred to as *leaf nodes*, contain no foreground images. At all nodes other than the root node, the user may also travel backwards, that is to the parent of the current node, by clicking on any of the background images.

The organization of sounds and images into nodes and the relationship between nodes is based on several factors. The root node contains a mixture of sounds and images from all other nodes and therefore the entire area of the nature walk. The level 2 nodes are divided into basic locations (or types of locations) along the nature walk. Nodes at deeper levels are more varied, however. In many cases, the path towards a leaf node involves a repeated “zooming in” on a specific object or phenomenon. For example, the “waves” node is a child of the “ocean” node and the “waves close-up” is a child of “waves.” In other cases, the progression is a spatial movement, as the connection between the “beach” node and the “ocean” node. Finally, some connections are not based on directly perceived spatial relationships. The “sand” node is a child of the “rocks” node because sand is made of the same material as rocks and rocks erode into sand.

However, in all cases, the path from root node to leaf node traces an exploratory artistic process: a set of decisions made by the artists, either in the field or studio,

to shift their own experience and, as a result, the experience of the audience. For example, the formation of the sand node is the result of the artists exploring the beach and discovering certain visual and sonic qualities of sand that they wanted to incorporate. Using controlled camera and recording techniques, the elements at deeper levels are increasingly separated from what is typically perceived in the soundscape and visual landscape. Hence, the depth axis can be considered as either an axis of artistic interpretation or a level of abstraction.

3.3. Parameters Used in Sound and Image Algorithms

At the algorithmic level, navigation is merely an interactive process that modifies parameters that are used to control sound and image arrangement and processing, which then influences in the methods of interaction. These parameters include the current node and its depth in the tree, the time passed since the current node has been reached, the horizontal and vertical position of the frame (the direction in which the user is pointing), the speed of movement, cursor position relative to foreground images, and position of the foreground images. The uses of these parameters are described in Sections 4 and 5.

4. SOUND DEVELOPMENT

4.1. Sound Collection

The basic challenge in collecting sounds for the *LovelyWeather* Project was to gather sounds that at once articulate the uniqueness of the various spaces and that work together to form a cohesive and interesting sound portrait. A further constraint was that the sounds would be organized in a semi-indeterminate fashion. This indeterminacy means that while any one sound can have the ability to move to the foreground and serve as a point of interest it must also not be so unique that it dominates the entirety of the audio stream. Earle Brown described this problem when discussing his attempt to utilize the sculptures of Calder as a score for a live performance: “the construction of units and their placement in a flexible situation that subjects the original relationships to constant and virtually unpredictable, but inherent, change” [1].

The technique for gathering the sounds was fairly conventional, namely a field recorder and various stereo microphone configurations. There were two basic settings for making recordings: the field and the studio. The field recordings are employed to represent the auditory gestalt of a given location. The studio recordings are used to isolate a single sound source and record it with no interaction from the larger environment. These studio recordings create greater abstraction of the sound source, often employing a performative action not generally associated with a particular sound source. The challenge in both situations was to represent the sound of an object without the recording having to great of an emphasis on

the performative action. Put another way, each object has a sound potential and there are multiple ways of exciting that latent potential. The key was to find a compromise between the sound potential of the object and the inherent audible signature of various performative actions. This means that in recording each object, there is first an experimental stage. This experimentation means finding the ideal manner(s) in which to excite each object. Accessing the various approaches was an intuitive task and one that balanced the individual sound and the library or sub library into which it would be categorized.

In considering how to best represent each sound we attempted to take advantage of source-bonding tendency. Dennis Smalley spoke of “the natural tendency to relate sounds to supposed sources and causes, and to relate sounds to each other because they appear to have shared or associated origins” [6]. We began our work in recording by assuming that indeed humans can identify the source of a sound and in so doing they are identifying the resonant properties of a given sound source and the spectromorphology that is commonly associated with each physical object. Noting the unique spectromorphologies there was an effort to record with performative actions that would either distinguish or homogenize a sound, depending on how it was deployed in the mix. In articulating the uniqueness of each region of the navigational space, the sounds employed are organized in a manner that emphasizes the characteristic sounds as well as gestalt of a location.

4.2. Organization and Processing for the Website

The emphasis of our approach is the organization of recordings to constitute a new sonic landscape that is drawn from an abstraction of a real soundscape. On the top level of the navigational space or root node, the recordings that are used are those that convey the expanse of a particular location. These recordings also include sounds that act as auditory signatures, where an effort was made to deemphasize the uniqueness of sounds and to create a static sound field, in terms of timbre and volume. This root node of the navigable space also features foreground images that have unique sounds associated with them. Here the challenge to create a unique sound object is accomplished through narrow bandpass filtering of the sound files and linking the panning information of the sound file with the position of the image. As the user navigates to deeper levels of the site’s tree structure, increasingly abstract recordings are employed. In contrast to the recordings in the root node that deemphasize unique sounds and spectromorphologies, these increasingly abstract recordings seek to emphasize dynamic contrasts of timbre and volume of each unique space. By combining these recordings of isolated sound sources made in a studio setting, a new and unique soundscape is generated.

4.3. Audio Processing to Articulate Various Spaces

In order to create a unique sonic identity for each area and level of the navigation, filtered pink noise is mixed in at low, yet perceivable level. The first step in producing the filter arguments (coefficients) is navigating the website and allowing the navigation system to trigger the appropriate sounds for each node. By employing a matching equalizer an average spectrum of each section is created. The average spectrum is used to set a filter, which filters pink noise. This filtered noise serves as a noise floor into and out of which the higher amplitude gestures of unique sounds can reseed and emerge.

The recordings all tended to exhibit a greater quantity of spectral information below 1000 Hz. Taking this as a starting point and in order to articulate an increased level of abstraction with deeper investigation, each level of the navigation into a particular tree structure is accompanied by increased volume in the filtered noise. Simply increasing the filtered noise at the common frequencies of the recordings meant a great deal of excess information and muddy mix. To counteract this and emphasize the contextually unique nature of this filtered noise, both a low shelf and high pass filter were applied to the sound recordings. When navigating from level 1 to level 2 of a tree structure, the second level employs a low shelf filter with a cutoff frequency around 1000 Hz. Further navigation into a deeper third level utilizes a high pass filter, also with a 1000 Hz cutoff. These different levels of filtering not only place greater emphasis on the higher spectral information in the recordings, but also increase the level of abstraction by emphasizing the synthesized component.

5. IMAGE ARRANGEMENT AND PROCESSING

The images are arranged in two primary layers: foreground images and background images. Background images are distributed randomly over the viewable area in the frame such that the images overlap and nearly the entire viewable area is filled. Foreground images are spaced almost evenly around the horizontal axis, although the exact position is random. As stated above, as the user navigates within one node, the images shift accordingly.

The primary real-time visual effect is controlling the transparency, or *alpha*, of images. Transparency of the images allows them to blend with each other, and as these values vary, different images become more prominent. As images reach the left or right side of the screen, they fade out. Likewise, as the user reaches the upper and lower boundaries of the viewable area, the images dim. Additionally, foreground images become slightly more opaque as the mouse cursor travels over them to suggest that they may be clicked. When the user navigates to a new node, a transitional sequence is initiated. First, movement is slowed and foreground images fade out. Next, over

several seconds, the background images cross-fade with images appropriate for the new node. Finally, new foreground images fade in and movement is enabled again.

6. CONCLUSION

The artistic process is both a learned and intuitive approach to dealing with the material at hand. With this project we attempt to represent the act of discovery that is central to the artistic process by empowering the user to navigate the material with which we as the artists have grappled. In so doing, the material is defined and refined in ways unimagined when we began this project. The discovery that is so central to creation continues to unfold.

By positioning www.lovelyweather.com on the internet, a wide range of people are invited into the aesthetic domain of the *LovelyWeather*. We hope that this exposure to one example of the process of abstraction, from recognizable material of the parent nodes to the highly abstracted material of the descendent nodes (children of children) will serve as a portal to comprehending aspects found in other works in the *LovelyWeather* project.

Moving forward, *LovelyWeather* will also include an electronically-mediated soundwalk (where the audience is instructed to listen to an audio file while walking on a prescribed path) and sound-sculpture installation, both of which will explore similar material but in different contexts. As www.lovelyweather.com is the first iteration, it will be interesting to track and compare how the different contexts exhibit different constraints on the material and the creative process. Having the website as a fixed point of departure for this aesthetic journey will allow the artists to track the changes and growth in the overall project and explore the evolution of technical and aesthetic approaches.

7. REFERENCES

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