Accumulation and Interaction in an Urban Landscape: 'The Urban Corridor'

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Abstract

The Urban Corridor explores the relationship between the public, visual and sonic stimuli, and space as a way of bringing to life the effect of the urban landscape on our day-to-day interactions. We describe the technical implementation and the conceptual implications of this installation by focusing on two issues: (1) the interactions between visual and musical processes, time and space, context and materials, and the role of the public in the piece, and (2) the accumulation of elements as a means of sonic organization and transformation.

Introduction

The Urban Corridor was presented from June to August 2000 at the CU Art Galleries, Boulder, within the context of the *Electronic Easel* exhibition. The installation consisted of a constructed space shaped as a corridor containing lights, motion sensors, two slide projectors, a video projector, and a multichannel sound system. The whole setup was run from a Macintosh PPC computer equipped with two CD-ROMs and an x10 two-way interface (x10, 2000). This paper presents the technical aspects of the installation and discusses the conceptual implications of the compositional process employed.

The first two sections state the objectives of the work and provide a brief description of its physical structure. The description is completed with a discussion of the characteristics of the space and the role of the audience in the temporal structure of the piece. The implementation of the interactive mechanisms is described in the fifth section. As a complement to an accompanying paper presented in this conference (Keller & Berger, 2001), the section following discusses the application of ecologically-based techniques to the creation of sonic events. The paper concludes with a discussion of the social references of this work, providing a specific example of the concepts discussed in (Keller, 2000d) and (Keller & Capasso, 2000).

Conceptual background and motivation

In the information and globalization era, with the development of new technologies of mass diffusion, the media has become an instrument of power and control. The media is concentrated in the urban environment and cannot exist outside of its physical space. The space of *The Urban Corridor* mirrors this urban space and enables us to critique the dynamics of creation and diffusion of information. We focus on the co-dependent relationship that ties the media, the urban center and the individual. On one hand, the media can shape the perception of reality and effectively impact the course of events. On the other hand, we believe that individuals can transform the character of the city and dictate the course of their lives and their environment (Attali, 1985). Art becomes the tool of the individual to influence this three-way interaction.

Visual elements

The visual components of the corridor are tightly related to the dynamics of the urban space. Several visual elements situate the viewer within the cityscape. As the visitor walks into the corridor, he is faced with a plexiglass mirror grid, reminiscent of the reflective surfaces of skyscrapers. Slides with views of various cities are projected onto this surface. The slide projector is placed 60 centimeters from the ground, four and a half meters away from the projection wall. This strategic placement allows the visitors to literally be in the image through their shadows. Broken tiles and walls covered with graffiti contrast sharply with the clean-cut look of the glass and steel constructions.

The dimensions of the corridor are 6 meters by 2.5 meters. While walking along the corridor, both sounds and lights are triggered by motion sensors. The progression of auditory and visual stimuli increases as the viewer walks further into the corridor. Complex sounds, shadows and intermittent lights enfold the viewer. The corridor ends with a large-scale slide projection of a distorted skyscraper and a video projected on the floor.

The video projector plays a five-minute movie in loop mode. The images mix found and original footage. Four ‘news’ events are interweaved: an automobile accident, a public demonstration, urban sprawl, and war. These events are designed to encompass the audience’s perception from global (i.e., war) to individual experiences (i.e., a car wreck). The edited news clips expose the process by which real occurrences become a mediated reality, closing the cycle of associations among social and individual processes (Keller, 2001).

The role of the audience

The audience is an essential part of *The Urban Corridor* since it is the body that activates the space. Without people, the installation remains mostly dark and quiet. The visitor cannot see the entire space at once. For example, on entering the installation the walls obstruct the view of the video projection (Figure 1). Exploration is encouraged by the progressive unfolding of visual and sonic elements. And most importantly, the temporal shape of the piece is defined by the pace in which this exploration takes place. The reverberant characteristics of the space change the way sounds are heard, but also the position of the listener with respect to the speakers modifies the perceived delay among events (Keller & Berger, 2001). Finally, the reaction of the audience to the stimuli in the corridor shapes their behavior and, in turn, also shapes the temporal distribution of the sonic and visual events. Thus, a feedback mechanism between the spectators and the piece is established (Georgescu & Georgescu, 1990).

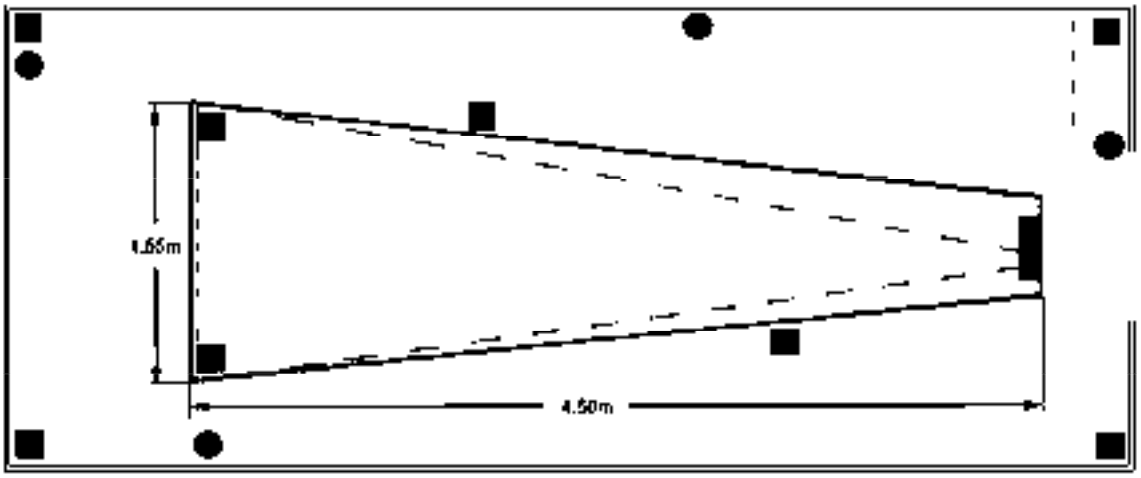

Figure 1. Sensor (circle) and speaker (square) layout.

The core system

The visual and sonic elements in *The Urban Corridor* consist of two layers of material: active and passive (Table 1). Active elements or events are triggered by the presence of the public and passive elements, or the environment, provide a constant background that reinforces the sensation of a surrounding urban landscape.

The active layer is controlled by means of x10-compatible motion sensors (x10, 2000). Four motion sensors placed at each section of the corridor detect the presence of people passing through. The sensors are set to different addresses (**A1**, **A2**, **A3**, **A4**) which correspond to different locations in the corridor (Figure 1). When sensor one detects motion, it sends the **A1 ON** command to a radio frequency receiver plugged into the power line. This receiver routes the signal through the line to an x10 interface that decodes it as a serial message. This message is received at the serial port of a Macintosh PPC and is translated as an **A1 ON** command by the *xTension* software (Sand Hill, 2000). Every 500 milliseconds, an Applescript running on the *ascript* Max object (Obiltschnig, 1998) checks the status of the **A1** address. If the status is **ON** it triggers an event in the *UCcontroller*.

Table 1. Active and passive layers in *The Urban Corridor*.

Controller	Protocol	Media	Content	Layer
		audio CD player	sound environment	passive
motion sensor	UCcontroller	CD-ROM 1	sound events	active
motion sensor	UCcontroller	CD-ROM 2	sound events	active
		slide projector 1	skyscraper image	passive
motion sensor	x10	slide projector 2	city images	active
motion sensor	x10	slide projector 3	city images	active
		VCR	edited news	passive
motion sensor	x10	lights		active
motion sensor	x10	lights		active

The *UCcontroller*, implemented in the Max environment (Puckette & Zicarelli, 1997), commands both sonic and visual events. Sound events are stored as CD audio tracks and are played back by the internal CD-ROM drive and by an added external drive (Figure 2). Each CD provides space for up to 99 events. Visual events are produced by the two slide projectors and the three sets of lights. When motion is detected in region one, an **ON** command is sent to address **A1**, corresponding to the projector placed at the entrance of the corridor. The **A1 ON** message generated by a script is interpreted by the *ascript* object. This message is routed to the serial port by the *xTension* software. In turn, the *CM11A* two-way x10 interface translates the serial message to an x10 message and routes it to the power line. The projector is plugged into an x10 lamp module which is set to address **A1**. When the module receives the **ON** command, it turns the slide projector on. Since the projector is in automatic forward mode the slides keep changing as long as the status of **A1** remains **ON**.

Layers of space

There are two forms of space in *The Urban Corridor:* the actual constructed space and the space created by the projection of sonic environments. The acoustic characteristics of the actual space are molded by the materials and the shape of the corridor. The construction features walls covered with metallic sheets and plexiglass and a concrete tile floor settled on sand. The parallel straight walls and the materials used create stationary waves and various patterns of reverberation (Grantham, 1995). Eight speakers are distributed along the walls and the ceiling. The effect of the three independent tracks playing simultaneously is akin to the multiplicity of events that usually occur in real-life urban landscapes.

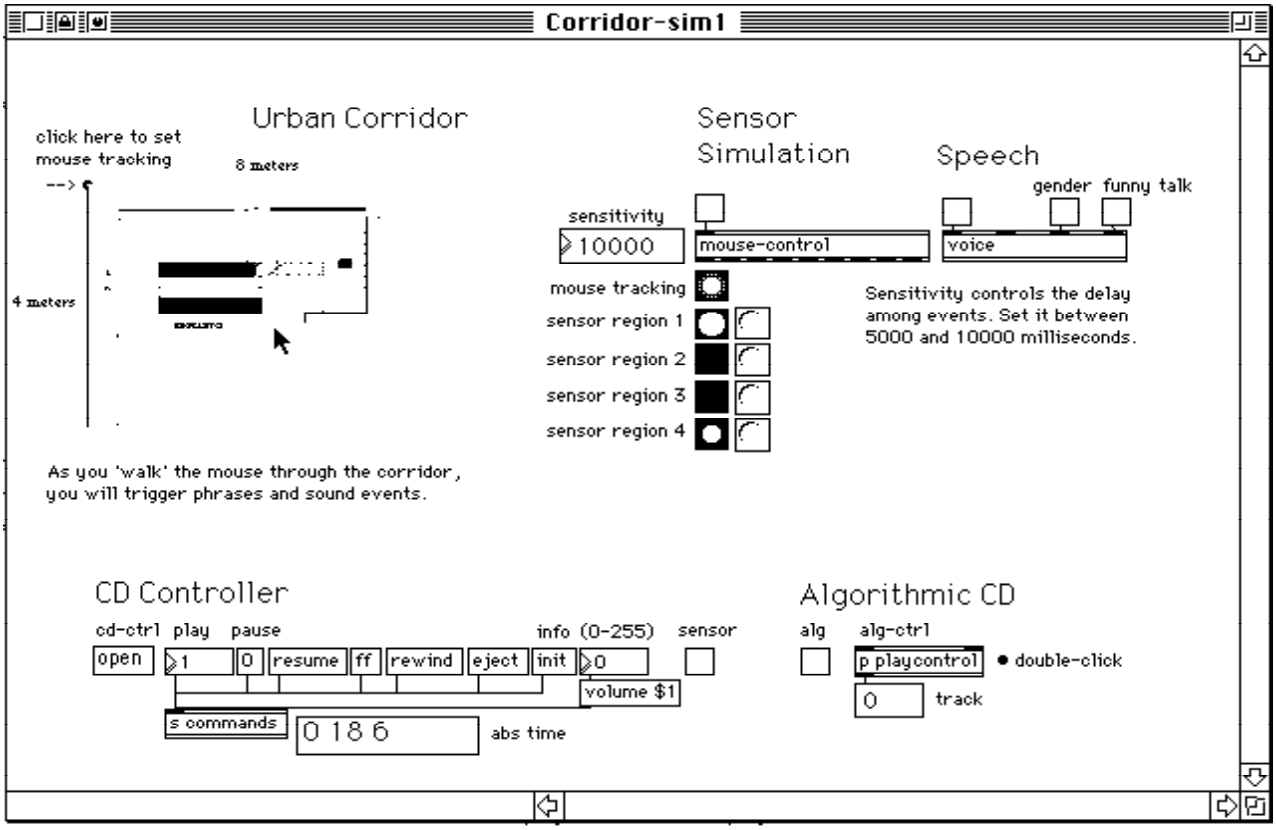

Figure 2. Interface of a simulation of *The Urban Corridor*.

Sonic structure

The processes of accumulation (Keller & Berger, 2001) and timbral transformation inform the techniques employed to generate the sound material. Within the context of ecologically-based work, short samples, or grains, are extracted from the recorded sources. These grains provide the basic spectral and micro-temporal features of the sounds to be synthesized (Keller & Truax, 1998). Thus, we ensure a continuum from the environmental elements of the piece to the events triggered by the motion sensors. Short events, modeled after the characteristics of a chosen recorded sound event, are synthesized by using constrained random distributions of grains (Keller, 1999). Ecological models create sound classes that feature ever-changing meso-temporal characteristics (Keller, 2000c). Once the events are synthesized, we recombine them in two ways: intraclass and interclass (Keller, 2000a). Intraclass combinations provide events with a greater number of meso-temporal elements, adding depth and volume to the sound. Interclass combinations create fusions and hybrids among sonic classes, extending the sonic palette to the realm of the imaginary.

The transformations applied to the recorded and the synthetic materials are also guided by the objective of obtaining smooth transitions between the environmental sonic space and the artificially modified sonic elements. Spectro-temporally complex sounds such as those created by the San Francisco subway only need to be transformed slightly to be musically interesting (Smalley, 1994). In this piece, we applied real-time granulation in order to change the temporal characteristics of the

events (Keller & Rolfe, 1998). Resonant filtering was employed to reinforce resonance peaks already present in the sampled sounds and to change the spectral color of unpitched events (Keller, 1999). Not surprisingly, the collected material provided a range of behaviors from harmonic stable evolutions to fast-varying temporally complex dynamics. Thus, the bulk of the work consisted of creating timbral bridges (Grey & Gordon, 1978; Keller, 2000a) among the pre-existing environmental sonic classes.

After obtaining several hundred simple events through ecological modeling or through temporal and spectral transformations, we merged these events using constrained stochastic algorithms. As is the case with meso-temporal patterns, this method ensures consistency at a local level while creating a variety of global behaviors (Keller, 2000b). Especially in the case of sonic classes generated by physical agents (Keller, 1999), these methods create patterns not attainable by traditional synthesis techniques.

For this installation, as for previous works (Keller, 2000e; Keller & Knox, 2000), we have produced between two and three hours of edited sound. This duration is required by the characteristics of the material: environmental sounds become mechanic and lifeless if they are subjected to simplistic processes such as looping or repetition. Given a large amount of data, a key aspect of the compositional design lies in the organization of effective sonic combinations by means of a well-structured sound database. The sonic behaviors obtained through the synthesis and transformation processes provide a range of events going from simple, 'realistic' sounds to complex, multifarious ones. Sound classes are distributed according to the position of the sensors. Sound events are grouped by levels of complexity. Most simple events are routed towards the entrance of the corridor and most complex ones are heard at the exit. This organization places a constraint on the spatial distribution of the sounds but keeps the local characteristics of the piece open. The selection process is random within each sonic class, therefore every listener gets a different version of the piece depending on two parameters: (1) the state of the sensors, and (2) the constrained-random choice of events.

Anchors

An important factor shaping the perception of *The Urban Corridor* is its geographical and social location. On a surface level, the piece situates the listener in a generic urban landscape. At a more detailed level, it provides references to very specific social issues (Keller & Capasso, 2000; Truax, 1996). The racial struggle is suggested by the intonation and the content of the recorded voices. The reference to class issues is further enhanced by sounds that locate the piece in a San Francisco neighborhood where marginals are usually found: the cable car, the drunkards, and the subway. Again, the link between the specific and the general is underlined by the relevance of the local issues presented in the soundtrack in relation to the global issues displayed in the images.

Summary

A corridor, "a long, narrow, densely populated area"[1] serves as a visual metaphor for the city's synekism[2]. The corridor is populated by sounds and images replicating the cacophony of news and information occurring within the urban environment. In it, people, news, and art, travel and interact through time and space.

Two processes underlie *The Urban Corridor's* temporal and spatial structure: accumulation and interaction. Accumulation informs the way sonic materials are created and organized. Sound events are constructed by modeling environmental sources and by creating timbral transformations among existing sonic classes. The synthesis methods exploit overlap and accumulation by building up complex events from the sonic micro-level, i.e., the grains. The second process is established by the relationship between the visual and the sonic material, the sounds and the space, the behavior of the public and the temporal structure of the piece. The characteristics of the sounds and images are dependent on the quantity and behavior of the viewers as they traverse the narrow space of the corridor. The presence of the public triggers sonic and visual events evoking an urban landscape. These elements are modified by the acoustic characteristics of the space and by the randomness of the triggering mechanism. Thus, the overall effect of the piece is never the same.

The issues brought up by the piece stem from the dynamics of urban life: racial and social discrimination, urban sprawl, accidents, public expression and war. Referential elements are embedded in the visual material which consists of news, views of the city, graffiti, and other urban elements, and in the sonic layers which combine recorded urban environments with synthetic and digitally processed sound events. The local and the global are intimately interweaved closing the network of interactions between the individual and the social space he/she inhabits. This interaction is the foundation upon which *The Urban Corridor* is constructed. And more generally, it is the process that determines the social function of this artwork.

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1 American Heritage Dictionary definition.

2 Edward Soja defines synekism as the stimulus of urban accumulation due to the spatial agglomeration of urban activities lying at the heart of modern innovations. From a lecture given November 9, 1999, at the University of Colorado, Boulder.

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