Documenting the Spatial Design of an Interactive Multisensory Urban Installation

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Abstract. *The paper documents the design and implementation of an interactive multi-sensory environment (DETOUR) created by the interdisciplinary group VE_Design[1] for an international open-air exhibition in Athens, Greece during the summer of 2004[2]. The paper describes the creative process followed throughout the project and registers how computers, sensors and effectors have been utilised to either facilitate the creation of electronically mediated experiences or support the design. The architectural concept of the multi-sensory installation is analyzed in relation to its potential for creating communicative experiences as well as addressing physical form simulations. Notions such as ephemeral structures, parasites, social space, game as art and communication are discussed. The body – space interaction is investigated, enabling the team to elaborate on a modular construction. Finally, the impact of the work is discussed on the basis of recorded observations by visitors.*

Keywords. *Interactive multi-sensory environment; ephemeral space; public art; embodied spatial experience; simulation of physical form.*

Introduction

DETOUR is an interactive multi-sensory environment, created by the interdisciplinary group VE_design[1] , as part of the "Athens by Art" international open-air exhibition during the summer of 2004[2] . This site-specific installation is designed for a very busy area within the urban context. It functions as an alternative environment embedded within the noise and introversion of the everyday cityscape. Visitors are invited to participate in a mediated communication game as well as with other visitors within the installation environment. DETOUR utilises a spatialised audio system, light-

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[2] The exhibition comprised 85 art works, was sponsored by the Athens City Council, in collaboration with the Greek Sector of the International Art Critics Association (AICA) and took place in central pedestrian walkways of the city of Athens, from the 11th of August till the 30th of September 2004.

ing, microclimate, and video elements with the aim of activating the senses, amplifying behaviours and instigating communication amongst its visitors.

DETOUR's artificial "landscape" has a memory. People are invited to interact and provide their voices and images to the system. These are then captured, processed, distorted and dynamically positioned, in real time, within the 8-channel audio system of the installation as well as an appropriately placed video projection. Consequently, processed versions of these sounds and images are randomly selected and communicated again to future visitors of the environment. In this sense, DETOUR is an artificial "landscape" which remembers the voices and images of people who visited it and randomly recalls them, thus redefining all captured raw audiovisual content. Visitors may also affect the way that sounds are being displayed by appropriately moving their body in relation to certain elements of the environment.

This paper aims at documenting the design and implementation of DETOUR, by describing the creative process followed throughout the project and registers how computers and appropriate sensors and effectors have been utilised to either facilitate the creation of electronically mediated experiences or support the design. The relation of this hybrid environmental experience with computer-aided systems is explored focusing on two directions:

• The architectural concept of the multi-sensory installation in relation to its potential for creating communicative experiences.

• Creating simulations of the installation's physical form in order to support its design, by understanding the spatial qualities and characteristics of spatial entities, spatial relations to the surroundings, the lighting and its audiovisual content. These simulations were developed by utilising:

1. 2D modelling tools facilitating surveying and enabling planning the installation within the available site

2. 3D modelling tools to enhance the volumetric design process

It is stressed that the real-time electronically mediated audiovisual experience was seen as an integral part of the overall environmental experience and consequently was taken into account as a central aspect of the architectural composition, during all phases of the design process.

The presentation of the paper will be illustrated by a number of architectural diagrams and other forms of representation, as well as images and video recordings of the final result. Furthermore, the impact of the work will be discussed on the basis of visitors' observations, recorded on site or after the event.

DETOUR's concept

The particular site selected for the installation was the flat roof of the eastern platform of the Thiseio metro station, south-west of Acropolis. The assignment of this site by the organisers[3] enabled the team to 'fixate' the design which was to that point handled at a conceptual level, investigating pedestrian flows, landmarking, soundscape creation as well as the design and implementation of lighting and the electronic sensors and actuators systems. The basic characteristics of this site are: the intense heat during most of the day in August, the adjacency to a park providing shade during the day, the historical and archaeological significance of the area[4] as well as its vicinity to a very busy pedestrian walkway[5].

Considering the above parameters, the inten-

At the time of assignment (less than a month before the opening of the exhibition), the site was still under construction, thus enabling the team members to co-operate with the contractors in order to shape the site, to an extent, according to the team's expectations.

The site is on Eptahalkoy Street, just off the pedestrian street of Dionysiou Areopagitou, providing views to the Acropolis and to the Keramikos ancient cemetery.

D. Areopagitou street, for the duration of the exhibition was crowded for almost 20 hours a day.

tion was to divert movement along the busy pedestrian walkway into an alternative strangely pleasant environment. This urban intervention would function as a living mechanism and transform the everyday experience of the citizens' body and consequently their affective response to the urban environment. Considering the specific site, a boomerang-shaped plan was developed in order to underline the real function of a detour: avoiding a route, consciously choosing a different one because of its qualities, in order to reach the desired destination. Appropriately, the title of the project indicates the intention to create and provide the city with a discrete space within the urban fabric that co-exists but also transforms the site within which it is placed.

The design of DETOUR

'Surroundings invite, provoke, and entice persons to perform actions, and the enacting motions of these actions not only serve up alternate vintage points but also inevitably shift sense organs about. The shifting about of the sense organs naturally affects how a person fields her surroundings and has much to do with what of the surroundings ends up standing for or approximating the surroundings' (Gins & Arakawa, p. 1,2).

'Bodily movements that take place within and happen in relation to works of architecture, architectural surrounds, are to some extend formative of them' (Gins & Arakawa, p. 50).

Designing DETOUR, gave the opportunity to reconsider the interaction between bodily movement and space, the idea of performance in architecture and the conscious treatment of the somatic senses in the production of space. The installation had to take into account the everyday experience of the passers by and transform it into a strong feeling, one that would awake the body from the motor habits and set it into conscious action. DETOUR's space had to function as a condenser of movement and 'happenings' that would allow free will and expressive acts to take place. This place of encounters should create a new social space within the urban fabric, being a field of action and a basis for action at the same time (Lefebre, 1991, p.191). Considering bodily movements, human flow, density and the nature of the site, the team decided to introduce a kind of an uncanny stage. This was the main deck of the construction that would constitute a platform for communication, a place with the maximum affordance of body accumulation and a place where one could walk or stand, relax, observe and participate.

The design process of the installation had to take into account a number of constructional and functional restrictions as well as theoretical notions that would empower the idea of creating an alternative multi-sensory environment within the city. A modular, flexible and ephemeral space had to be invented that would hold and stand the harsh conditions of an open-air exhibition. Moreover, this space had to support a particular function; that of a parasite fed by the everyday life of the cityscape. According to Andrew Benjamin (2002): 'Parasites intrude and inhabit. In doing so their presence demands a rethinking of sites of inhabitation'. By considering DETOUR, as a kind of organism adherent to the city fabric, we had to re-consider the symbiotic relationship between natural-artificial environment, built-open space, old-new, static-interactive and finally isolated-incorporated.

Taking into account the mediating functionality of this installation that consisted of interactivity amongst visitors as well as between visitors and certain environmental elements, this ephemeral space had to be identified under the notion of Game and Play.

'The ordinary adult body is a creature of habit, unconscious responses to physical stimuli, unadventurous, routined. For the most part, we travel in a kinaesthetic rut, never even noticing the remarkably intricate changes that happen when we walk or run, reach up, sit, or lie down. We rarely experiment with these familiar actions once we have mas-

tered them. To take notice or to run experiments in everyday life, would crowd our consciousness with details, making us nearly dysfunctional…

Play and art have often been regarded as related activities that allow us to ignore the exigencies of daily existence and spend time concentrating on the pleasures, skills and powers that our bodies – or other bodies – possess' (Banes, 1987, p. 21)

Aiming at exploring the way body and space interact in order to shape the embodied spatial experience, DETOUR's design process, placed an emphasis on the forms of interaction with the objects carried out by the main platform and the patterns of bodily movement the platform and the objects afforded as a whole. The objects of interaction had to be identifiable structures, inviting the visitor in a kind of one-to-one interaction. The shape and form of these constructions resulted from 'deconstructing' the wooden deck and by 'dislocating/breaking up' selected parts of the wooden planks. We called these structural members 'Trees' although the purpose and the challenge were to create a form that the visitors would be free to identify with, in a subjective manner. The form is almost primordial; devoid of any complex constructional detail. The vertical elements resemble derricks, brackets or arms of a dismembered body. They provide simple but strong images that can be retained in visitors' memory, thus functioning as the trademark of the installation. It is suggested that the interaction of the abstract properties of the 'structural units' of space with the embodied memory play a crucial role in the conceptualization of spatial meaning.

Working on an idea that wasn't yet site specific, allowed the team to elaborate on a modular construction, mainly a deck that would support a number of structural, vertical elements. The initial concept worked on hand-sketches and diagrams evolved into 2D and 3D modelling on the computer as soon as the vertical elements were defined and the site of the intervention was determined.

The 2D modelling tools supported the creation of the final form of the platform and the setting in the proposed area by scaling and stretching the initial form in order to create a space that would function as an accessional environment, that wouldn't be isolated but on the contrary be absorbed by the city.

The 3D modelling tools aided the evolution of the idea enabling a parallel examination between the spatial volume of the installation and the mass and layout of the surrounding cityscape. Moving up one dimension, from 2D sketches, plans and elevations, was a necessary step towards the deeper understanding of the embodied spatial experience concerning the installation, the site and the surrounding landscape (buildings, streets, parapets, trees, etc). At this stage, lighting (both natural and artificial) was considered, investigating projection (surfaces, placing, size, and orientation) as well as methods of 'landmarking' the installation.

It is understood that the spatial experience afforded by the installation is created not only by static elements but also by the fields of activity created as a result of visitors interacting with appropriately positioned sensors and perceiving multi-sensory output produced by auditory and visual displays. Therefore, the final set of tools employed during the design process, were real-time representations (virtual reality and multi-channel spatialized audio), which affected the relation of the sensorimotor system of the human body to the proposed installation in different ways. Issues investigated included anthropometrics, concerning the scale of the vertical elements of the installation, dimensioning the interaction volumes within the deck, ramp sizes, tiers, vistas to the Acropolis and the main city and finally occlusion paths. Regarding the audio, the aim was to enhance the spatiality of the installation as well as the environmental experience in a twofold manner; 'expanding' the physical borders of the installation by creating a much larger soundscape mainly directed to the main pedestrian street of D. Areopagitou and secondly organizing a focus area in the centre of the platform where the main interaction took place.

Implementing DETOUR

The hardware

The Deck

Early on during the design process, it was decided to raise the users from the original street level in order to mark the boundaries of the DETOUR installation, introduce a degree of instability, facilitate some form of isolation from surroundings and enhance the overall experience. The deck is a timber construction of low-grade raw material giving a long lasting and rough finish to the project.

The 'Trees'

The deck is 'pierced' by ten beams that unfold to up to 3 metres and 'embrace' the activities taking part within the main deck. These structures are made out of timber and bear all input-output mechanisms:

Interaction Pods: Two timber enclosures each, featuring an activation button, a web-cam for live feed video capture and a microphone. The pods are placed on the two central 'trees' opposite one another thus formulating the central interaction-play space

Digital Sensing hardware: Four proximity sensors placed within appropriately constructed fibreglass spheres and mounted onto 'trees' neighbouring the Interaction Pod ones

Audio Playback: Eight loudspeakers on custom-made plywood enclosures mounted at ear level on each non-interactive 'tree'

Microclimate Effectors: Water spray jets, spraying from the top of each 'tree'

Audio

The influence area of the sound played back by the system exceeds a hundred metres, value greater than the visibility of the installation (considering ground morphology of the area, typical crowd density and neighbouring interfering structures). It is important to stress the fact that the installation 'amplifies' typical aural sensory values, promoting sound to becoming the main means of instigating communicational activity amongst visitors. At the same time, appropriately programmed real-time transformation of this audio input secures a less direct communication of linguistic messages.

Video

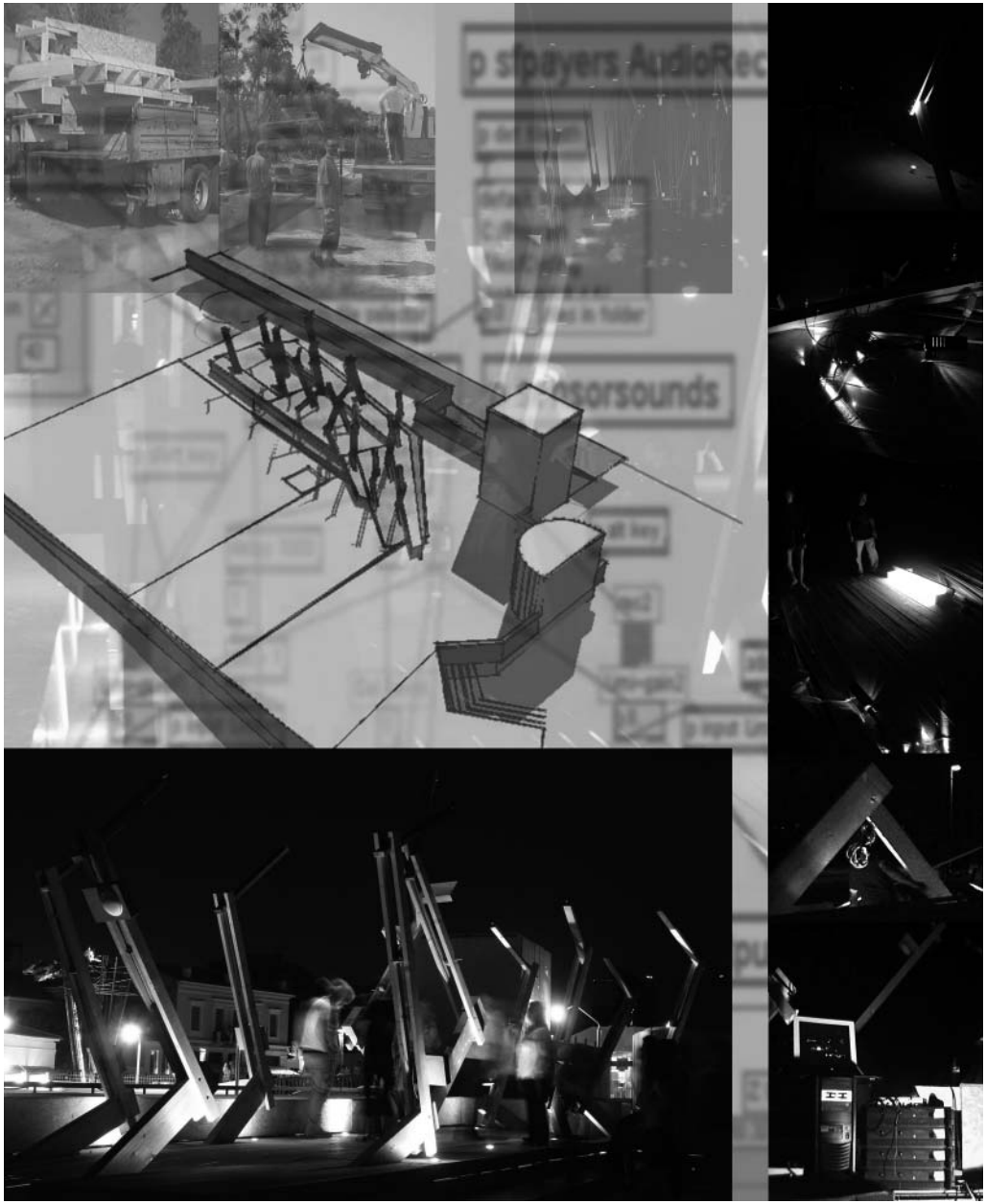
Images captured by DETOUR are processed, reorganised and displayed on a metro station lift wall at the northern side of the installation. Projection is only activated when ambient lighting is low, on Athenian August days, typically after 9:00pm. The intention is that this visual display would inform people passing by the installation of what is going on within the space and function in a complementary manner to the audio output, possibly attracting their interest.

Lighting

The deck consisting of timber planks placed a few millimetres apart enabled the installation of under the deck neon diffuse lighting. In order to create a dramatic effect on visitors' figures, add fill-in light for camera capturing and highlight the 'trees', a spot light is flush mounted on the deck underneath each 'tree'. It should be noted that municipal street lighting as well as the neighbouring metro station produce a level of ambient lighting sufficient for the activities within DETOUR; hence no main lighting was included in the construction.

The software

A PC equipped with an 8-channel audio system running Max/MSP and Jitter software, interfaced with the proximity sensors, switches, microphones and video cameras was secured within the construction. The software randomly selected images, were processed and displayed on screen. Regarding the auditory aspect of the environment, the system database kept all sounds recorded within the life of the project, and at a later time proceeded to randomly select some of them, transform and



display them, along with all other real-time captured and displayed audiovisual content.

Observations

The artists generally thought that the main objectives of this work had been achieved: people were very much involved in the experience, they interacted with elements of the installation, played and enjoyed the experienced, experimented with ways of using the installation elements that the artists never thought of and often exhibited affective impact as a result of their experience.

Visitors could be categorized into the following categories, according to the way that they responded to the experience: Passers-by who merely stared and listened to the installation environment, visitors who interacted for a period of time, visitors who were too keen on interacting that gradually acquired the role of a performer, visitors who played a functional role in helping others experiencing the environment, and those who reacted badly onto elements of the installation and vandalized them.

The instigation of communication amongst individuals who happened to pass by the installation space and the creation of an intense embodied experience, were amongst the most important objectives achieved by the installation.

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