nite_aura:  
an audio-visual interactive immersive installation

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1. Introduction

Immersion and engagement are topics of great interest in the HCI community. Researchers in Gaming, virtual reality, and augmented reality are interested in what it is that draws and holds a user’s attention. Most of these works are focused on active engagement and high stimulus. nite_aura is an audio-visual, interactive installation exploring physical, auditory and visual motion within an immersive environment. In this project, we tried to create an alternative immersive environment focusing on sensual and physical interaction with audio and visual aspects. The immersive environment created is an environment of introspection rather than achievement. The work investigates the effect of the texture of space, light and sound in providing a comforting, relaxed immersion.

2. Immersive Experience

The overall shape of the space, a bell or skirt shape, is an experiment in the effect of shape on immersion. The fluted bottom provides the entrance to the environment. Once inside there is an awareness of a constriction towards the top. We have chosen a diameter for the space that produces this sensation while not impeding the interaction. Users inside the structure may physically engage with the structure’s motion by pulling on ropes attached to the top of the structure as one would pull on a rope to ring a church bell. This organic motion provides the basic vocabulary for the phrasing of the user’s engagement. This motion encourages a harmonic engagement with the environment. The user may instead allow the structure to settle and experience the environment in a more contemplative mode, experiencing the visceral textures of light, sound and fabric. The design of the environment allows the user to more passively experience the effect of their presence in the space. Our short term goal is to observe users in order to gain insight into whether such an experience becomes immersive, while our long term goal is to understand the effect of the shape of a space on the sense of immersion.

3. Implementation

The basic structure is a cloth bell hanging from a single point, which allows the structure to swing freely when users duck inside. An accelerometer attached to the top of the structure tracks the motion of the structure and relays the information to a computer. In response, the computer creates and sends manipulated light and sound patterns.

The light texture is inspired by stars in the night sky. The information from the accelerometer relates to the motion of the space. This is used to morph an abstract color shape generated on a computer. The animated color pattern is projected on a tight matrix of fiber optics. The tight matrix of fiber optics then breaks out around the outside of the structure. Each individual strands then pierces back in through the fabric making the light tip visible to the user on the inside. The effect is that of constellations of light specks covering the walls of the environment, enveloping the user. The animated color shifts are perceived as pixilated, shifting textures like twinkling stars or the firing of synapses in some imagined consciousness.

The sound texture parallels the light texture in concept. Granular synthesis techniques are used to morph sounds recorded in the space into abstract memories of being. Microphones around the surface of the structure and in the middle of the structure record sounds produced in the space to several buffers. Highly directional microphones are used to focus on the user’s sound and minimize the extent to which the playback sound is rerecorded. Sound detection algorithms are used to further privilege the user’s sound and reduce the amount of dead space in the recordings. On playback, the buffers are cut into sound grains 30 – 80 ms in length. These grains are played back and mixed with grains from other buffers to varying degrees. This technique allows the sounds to morph in timbre and time while still retaining some semblance of their original structure. The effect varies from recognizable voices and words to abstract night sounds of animal chirps and the crackling of fire. The sound texture is then further embodied with in the space by applying a set of resonating filters tuned to mimic the resonance of a large bell. The recognition of the vocal textures suggests to the user that their presence is having some effect and yet they do not need to be actively involved.

3. Discussion

nite_aura has been developed as both an artistic work and as a tool for research into immersive environments. It’s design has been informed by art methodologies, technical experience and philosophic questioning. We are interested to see if users experience the constriction as an enveloping safe space or as uncomfortable restriction. As it has just recently been completed we plan to enlarge our user testing in the environment.