THE COCKTAIL MONKEY EFFECT

ABSTRACT

Incorporating physical computing and algorithmic composition, *The Cocktail Monkey Effect* is a sound installation and kinetic sculpture that problematizes the kinship between the virtual and the physical. An array of 64 cocktail monkeys and a corresponding array of 64 digitally-controlled analog oscillator circuits are the heart of the installation. Together, they provide a kinetic and sonic reification of simple mathematical abstractions. But instead of employing technology to translate visual space into sonic space, our installation exposes the gap between them, sometimes coordinating them and at other times opposing them. The installation does not establish a comfortable relationship between synthetic and organic life; rather, it critiques such relationships by highlighting discrepancies in the technological manipulation of data itself.

1. INTRODUCTION

The Cocktail Monkey Effect is an audiokinetic installation work in progress that explores and problematizes the kinship between the virtual and the physical. The paper describes the technical aspects of the installation as well as the artistic motivations and underlying theoretical principles that guide our work. We begin with a brief explanation of the technical aspects of the piece.

2. TECHNICAL DESCRIPTION

2.1 Sound Installation

Each of the 64 analog oscillator circuits feeds to a speaker powered by a simple LM386 amplifier; these speakers are distributed in an 18-by-9-foot wire web (see Figure 1).

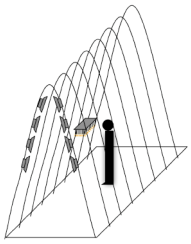

Figure 1. Simplified representation of the installation. Each wire holds eight speakers (those on the wires behind the first have been omitted for clarity). The cocktail monkey array is in the middle of the speaker matrix, at eye level.

Two Nand Schmitt Triggers, one modulating the other, produce the sound for each of the 64 speakers in the array. A capacitor sets the frequency range for each Schmidt Trigger. An AD5206 digital potentiometer controls each circuit's carrier frequency, modulator frequency, and overall amplitude, allowing for digital control over 192 different parameters in the complete speaker array. Implementing multiplexers, we are able to control all the oscillators from a single Arduino microcontroller. Figure 2 shows the basic circuit and Figure 3 the signal routing for the speaker array.

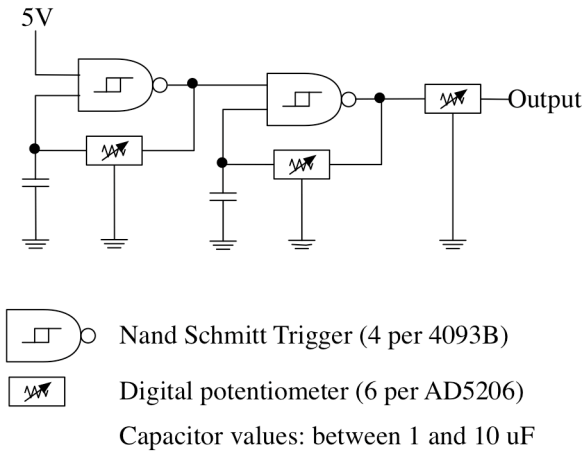

Figure 2. Oscillator circuit schematic.

2.2 Kinetic Scupture

The corresponding kinetic sculpture consists of an array of 64 monkeys. The monkeys, arranged on a two-dimension plane, attach to 64 digitally-controlled servomotors. The motors are contained in a wooden box with a perforated piece of glass at the base. The vertical position of each monkey is determined by the angle of the servomotor (configured for 180 degrees).

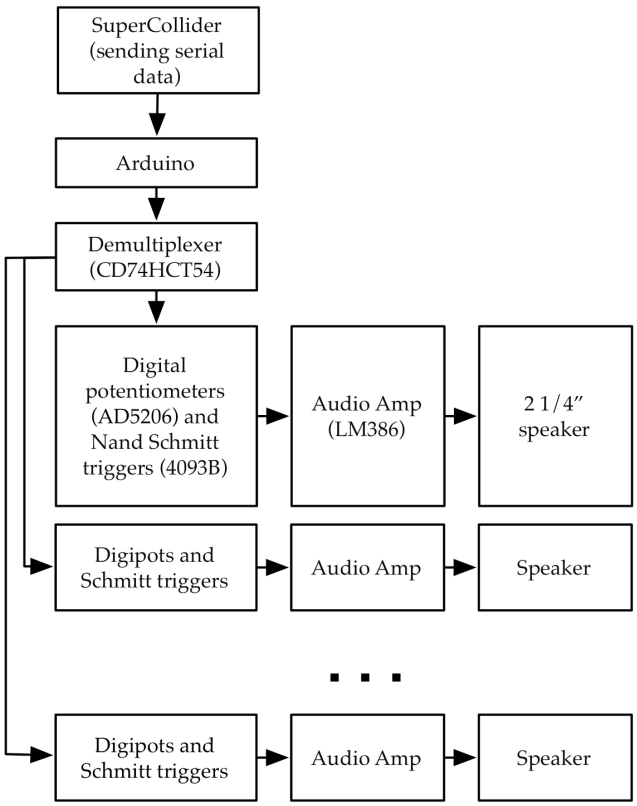

Figure 3. Sound signal routing.

2.3 Simulations

We include two one-dimensional video simulations of the installation as .mp4 files. In these simulations, the eight balls represent eight monkeys, and the colored bands represent the three parameters of four pairs of oscillators. Mathematical expressions produced by a SuperCollider unit generator feed into our monkey array and speaker array. In Simulation 1, a sine wave controlling the monkey positions moves in and out of sync with another sine wave controlling the oscillators. Simulation 2 demonstrates another mathematical model. Here, four pairs of two balls each map linearly to four pairs of oscillators. The balls move sometimes in tandem with the corresponding oscillator volumes, and at other times independently, in random intervals of approximately 20 seconds each. The simulations' sound is recorded from the analog oscillators we will use for the installation.

3. ARTISTIC MOTIVATION

What underlying artistic concept could possibly justify the realization of such a project? We would now like to discuss our artistic motivation, not by reflecting on our own creative processes, but by providing some observations about the intersection between art and technology.

3.1 Physical Computing's Analog Nostalgia

Working at the margin of the field, we have witnessed the exponential growth of interest in Physical (Embedded) Computing and HCI (Human – Computer Interaction) in the past few years. What was only a whispered knowledge a few years ago has become almost a common practice today, at least among New York-based digital artists. Curiously, the emergence of physical computing is accompanied by a growing fascination with outdated analog technology. One should not overlook the link between the ever-increasing fetishization of analog technology and the attempt to "bridge the gap between the physical and the virtual", to quote Dan O'Sullivan and Tom Igoe—the authors of *Physical Computing* [3]. Although they take very different shapes, the two phenomena are not contradictory, but rather complementary projects.

Arcane analog technologies facilitate our fantasies of an idealized longing for the warm sound of a vinyl record. The gap between the analog and the digital worlds that interactive technology promises to bridge is itself productive of a certain nostalgia for outdated technologies, configured as a means of gaining access to a lost sense of the natural world. If analog technology is indeed a signifier of a lost authentic expression, of a reality that is somehow more "real" than that of the digital realm, our installation subverts this illusion. By reifying a transparent formal procedure, deprived of any expression or individual particularity, we unveil the similar technological impulse at play in the manipulation of data from both the physical and the virtual alike.

Instead of employing analog and digital technologies to produce a translation from one type of knowledge to another, our installation finds them working in tandem, producing a relationship not between synthetic and organic life, but between different manipulations of technology itself. To this end, "The Cocktail Monkey Effect" explores the ways in which technology produces relationships between the sonic and visual perception of space. We wish to problematize the naturalization of this relationship in audiovisual art, as well as in everyday understandings of the world.

3.2 Naturalized Audiovisual Relationships

In the fields of computer music and video art, technology is often employed to *unify* sonic and visual perception. Norman McLaren's work *Synchromy* provides one example among many of this inclination. Employing a technique that physically records the sounds that accompany cinematic image onto photographic film, McLaren's *Synchromy* establishes a material relationship between the visual and the sonic. Alex Rutterford's video for the Autechre piece *Gantz Graf* provides another, digital example in which visual and sonic material map directly to one another. Rapid sonic changes seem to produce visual changes, which happen at the same rate. A common practice in narrative film is to perform the opposite extreme. The concept of *diegesis* assumes that sound can be severed from the spatial reality a film creates.

In contrast to both of these models, we wish to hold in relief both the synchronization and separation of sonic and visual spaces. After Michel Chion, we wish to "formulate the audiovisual relationship as a contract—that is, as the opposite of a natural relationship arising from some sort of preexisting harmony among the perceptions." Our aim is to create an experience in which participants are forced to confront the paradox of the auditory/visual disconnect so that they might gain a deeper understanding of their own naturalized relationships between the two spatial senses. In this way, we see our work similar to that of "the Ecological Detective": "to determine the support that the data offer for each competing model or hypothesis."

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The field of psychoacoustics abounds with examples of the disconnect between material and perceptual understandings of space. The cocktail party effect provides one example among many of the disconnect we seek to explore. This effect contradicts a naturalized model of the relationship between sound and space—that is, the assumption that the material presence of many distinct sonic subjects in a space would result in the perceptual experience of many distinct sonic subjects. Experience, however, contradicts this assumption: the listener's perceptual experience is of a single sonic subject—the particular conversation in which one is engaged. It is this phenomenon that inspires "The Cocktail Monkey Effect". The vacillation between audiovisual correlation and disjunction jars the participants' perception, and critiques the utopian dream of a physical world that maps perfectly onto the virtual.

4. REFERENCES

[1] Chion, M. *Audio-vision: Sound on Screen*. New York: Columbia University Press, 1994, p. xxvi.

[2] Hilborn, R., and Mangel, M. *The Ecological Detective: Confronting Models with Data*. Princeton, NJ: Princeton University Press, 1997, p. xii.

[3] O'Sullivan, D., and Igoe, T. *Physical Computing: Sensing and Controlling the Physical World with Computers*. Boston: Thomson Course Technology, 2004.