Role Reversal

Submitted to the Art Department, Allegheny College,
in partial fulfillment of the requirements for
the Degree of Bachelor of Arts

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Artist's Statement

Rather than relying on hearing merely as an unconscious survival mechanism, several clever humans of antiquity recognized that they could use their voices to give significance to the objects around them, to entertain themselves, and to actively communicate the location of food or the presence of danger. Ultimately, this linguistic behavior progressed to the ostensible zenith we now bear witness to wherein humans are able to share hopes and dreams, write poetry, and philosophize. My motivation for this work is the belief that many of us overlook the true importance of sound due to a physiological bias toward vision. This tragedy is exacerbated by the fact that our language is fundamentally a creature of the sonic dimension. My work seeks to create an environment where the visual and auditory modalities are shifted such that aural perception takes precedence over visual perception in an inverted yet analogous way. By creating this work, I hope to engender in the minds of its observers a new appreciation for the importance of sound in their subjective realities.

- Kevin Donahue

As humans we are greatly privileged to have the facility to perceive the ever-evolving dance of air molecules within a space, and to have mind to reflect upon this fact. However, it is to our great detriment that these realms of sonic beauty naturally recede into the background of our conscious awareness for much of our waking lives. Vision is typically recognized, consciously or unconsciously, as the preeminent sense. It is through vision that we apprehend what we hold to be the truth, navigate our bodies through the universe, and behold those around us. Even in our language, despite its nature as a sonic phenomenon, (though from time to time converted and recorded onto stone and paper for posterity's sake) metaphors referencing vision run rampant. We 'see' what we mean, we 'shed light' upon the truth. Through the vicissitudes of evolutionary unfoldment, it became necessary for our aural sense to continually receive data so that we may be alerted to shifts in our immediate environment. This serves to inform the brain of approaching predators, the proximity of prey, the endangerment of our offspring, and a slew of other phenomena conducive to evolutionary success. Within roughly the last hundred thousand years however, humans began to use this sense for something much more profound. Rather than relying on hearing merely as an unconscious survival mechanism, some clever humans recognized that they could use their voices to give significance to the objects around them, to entertain themselves, and to actively communicate the location of food or the presence of danger to others. Ultimately this behavior progressed to the ostensible zenith we now bear witness to wherein humans are able to share hopes and dreams, write poetry, and philosophize. My motivation for this work is the belief that many of us overlook the true importance of sound and our relationship to it.

The significance and tragedy of this ignorance lies not only in the fact that the sounds themselves are beautiful but that our language resides in this domain. If we are physiologically pre-programmed to tune out most sonic input, it is no great stretch of the imagination to assume that our ability to share the contents of our minds is also inhibited in some way. My work seeks to create an environment where the visual and auditory modalities are shifted such that aural perception takes precedence over visual perception in an inverted yet analogous way. By creating this work I hope to engender in the minds of its observers a new appreciation for the importance of sound in their subjective realities.

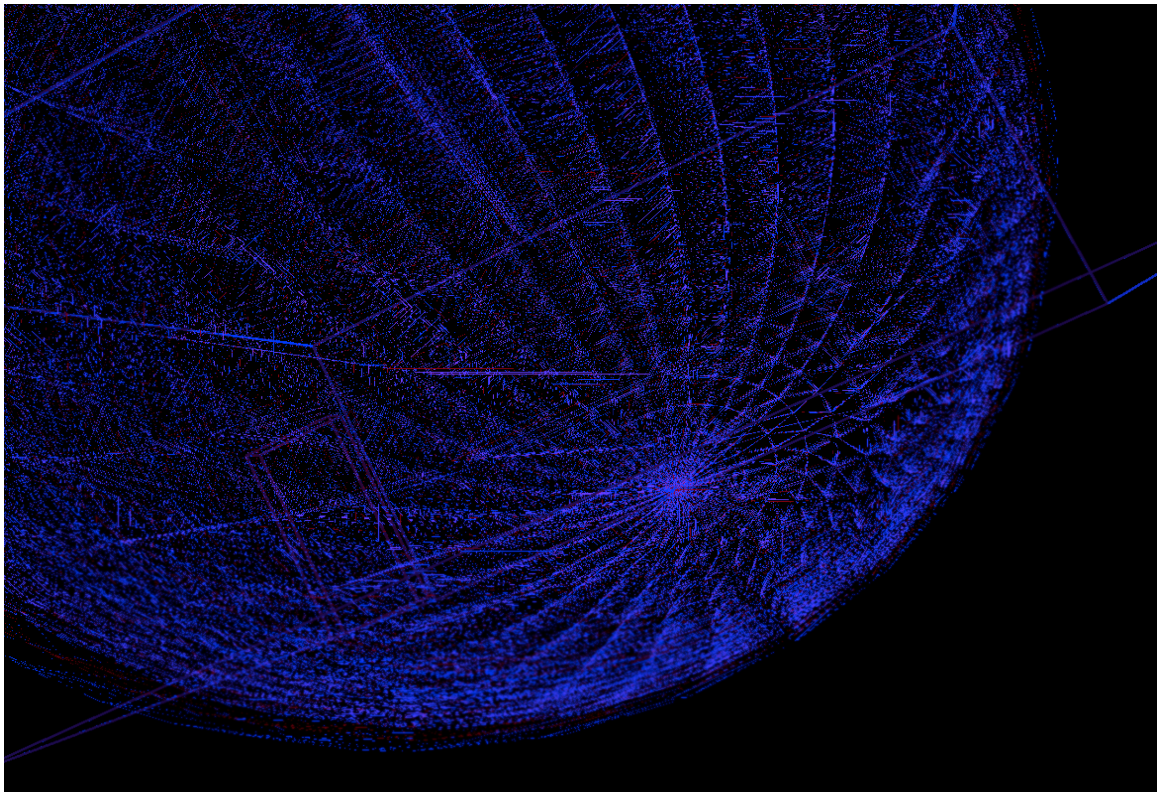
I would like to begin with a small amount of technical information related to the phenomenon of sound and the functioning of the ear, because I find its intricacy and beauty highly inspiring. What we call sound is essentially the recognition of pressure variations within a medium (air, water, or solid) by the human mind. These pressure variations consist of zones where molecules are densely packed, and areas where the molecules are diffuse. For example, when the woofer of a speaker extends outward, it creates an area of high compression where air molecules become densely packed. The air molecules surrounding the woofer are propagated outwards, colliding with surrounding molecules, causing them to radiate outwards in all directions; gradually losing energy as they move further into space. When the cone of the speaker retreats inwards, an area of rarefaction is created; air molecules within the vicinity of the woofer spread toward it to fill the empty space. This ebb and flow of air pressure caused by the vibration of a source is the essence of what we perceive as sound. (Plack 2)

But to perceive this phenomenon as ‘sound’ an animal observer requires a particular sense organ. As most people know, the eardrum, which resides at the end of the ear canal, plays a pivotal role in our perception of sound. However, it is far from being the only internal component that is responsible for translating the external pressure variation into what we consciously experience as ‘sound’. Firstly, the eardrum vibrates in accordance with the external sound waves entering the ear canal. Three incredibly small bones collectively known as the ossicles carry the vibration from the eardrum to the oval window of the fluid-filled cochlea within the ear. The vibrations cause pressure variations in the cochlear fluids, which in turn cause the surrounding basilar membrane to vibrate. Interestingly enough, the basilar membrane responds to incoming frequencies at different locations all along its surface. At the top of the cochlear spiral (known as the apex), the basilar membrane is thick and loose; responsive to the lowest frequencies we can hear. As one traces down the spiral of the cochlea, the basilar membrane becomes thinner and more rigid; progressively responding to higher frequencies. Hair cells cover the surface of the basilar membrane. Small hairs on top of these cells (known as stereocilia) move back and forth in accordance with the vibration of the basilar membrane. The swaying of these hairs causes small openings within the hair cells to be exposed; allowing potassium ions to enter the cell and change the cell’s voltage. This change in voltage causes a neurotransmitter to be released from the hair cell to a nearby neuron. The signal then travels along the auditory nerve to the cerebral cortex. This is a process that never switches off and gathers data from all directions around the observer. In terms of localization of sounds, our ears can detect timing differences down to ten microseconds (ie ten millionths of a second). (Plack 16)

My work consists of a union between audio and computer-generated graphics brought about by the audio's fulfillment of multifarious syntactical statements I wrote within the program 'Processing'. I designed each element of my work with the intention that when installed within a darkened space, it would grant a sense of maximal sonic interest and minimal visual impact. My aim was to craft an inversion of the typical relationship between sound and vision wherein visual information commands conscious attention and aural input rarely ascends to the same platform of apprehension. While the crux of this project is to create an environment of sonic dominance, I still felt it necessary to include a visual component because I found the idea of flipping the ordinary relationship between sound and vision particularly aesthetically alluring, and thus this new minimal visual aspect would become analogous to the role of sound in the typical awareness state. This led me to ponder what the flow of conscious audio input may 'look' like and what its relationship may be to the more dominant modality of vision. I also realized that in this case, the visual element must not be the center of attention. It should shift in and out of apprehension in the same way that sound fades in and out of conscious awareness in the default state of being.

The rotating and shifting objects were created in the program Processing, a programming environment that allowed me to write code that would draw and move shapes I indicated depending upon how and when the imported audio file met certain conditions I stated within the concatenated code. For example, I can tell processing that when the left channel of audio is playing at a certain amplitude, processing should draw a certain shape. From this point I can then dictate along what axes the shape rotates, how quickly it does so, what colors the shape should have at a certain time, etcetera. There are

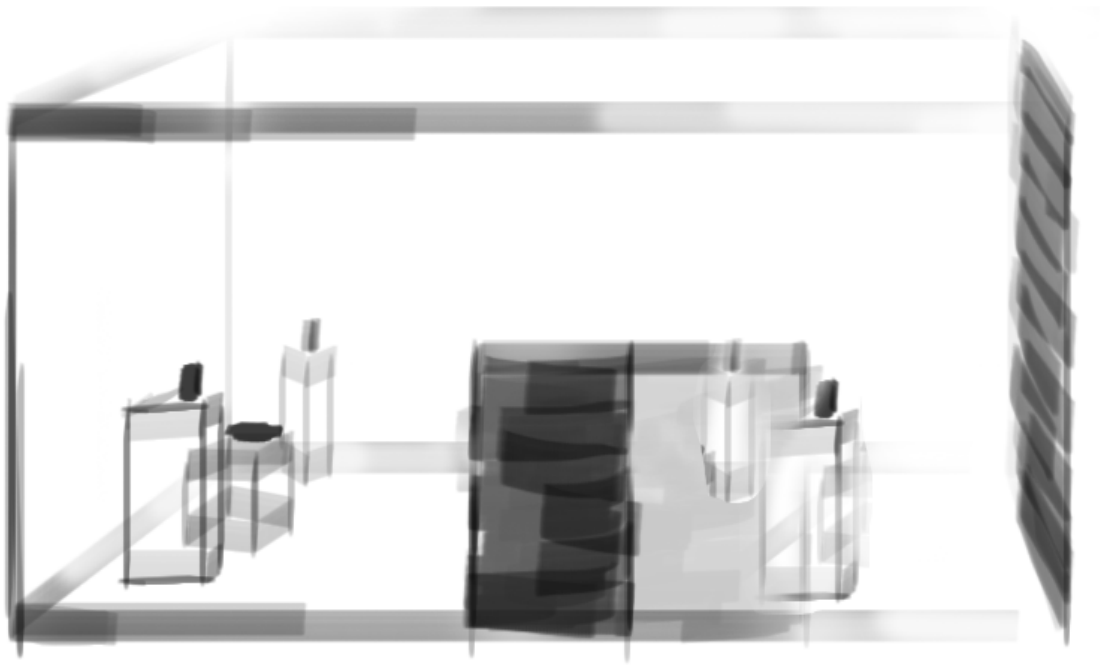
very many parameters that one can manipulate, so I found experimenting with the code to be paramount to the evolution of the animation and to my learning of the language.



Kevin Donahue. *Role Reversal*. 2013. Air & Computer Code.

The fact that my work was to be installed in the Megahan Gallery was always in the back of my mind. This notion played a crucial role in the unfoldment of the project. As my processing skills developed and I was better able to express myself in this digital dimension, I began thinking about how to craft an image that would work in unison not only with my audio, but also with the space itself. Suddenly, I came up with the idea of drawing a three-dimensional rectangle with the exact dimensions of the Megahan Gallery interior. I did a little bit of math to translate the dimensions of the Megahan walls to the size of the rectangle seen in my work. Conceptually, I was very attracted by the idea of an observer within the space looking at a digital recreation of the space they stood in without the knowledge that they were doing so. The spherical shape came to represent the

sound of the space; undulating in harmony with the actual audio in the room. One thing I had not anticipated was the extremely reflective nature of the room. When air molecules emanating from a source collide with the walls in such a reflective space, the vibration is unable to die out before it reaches another wall, reflecting again (and slowly diminishing in strength each time). The first time I played audio in the room I realized this lapse of judgment and became aware of the inhibited perception of detail within the audio. The room colored the sound so much that sounds being played a half second before the present moment were still traveling through the space as new sounds were being produced. (Long 91) This resulted in frustration, but ultimately I learned to accept this fact and find ways to improve the overall experience. I found that the work was most effective during the 'shock' of entering the dark room with non-adjusted eyes. This allowed the sounds to become the preeminent aspect of the space. As my eyes adjusted to the lack of light, I felt the piece became less effective. Despite this, the fact that the piece did produce the intended result for a moment made the piece worth the effort I put into it. I just wanted to construct an environment where common sounds would reign over their accompanying visual elements in a way that caused people to think about the meaning of sound in their lives.



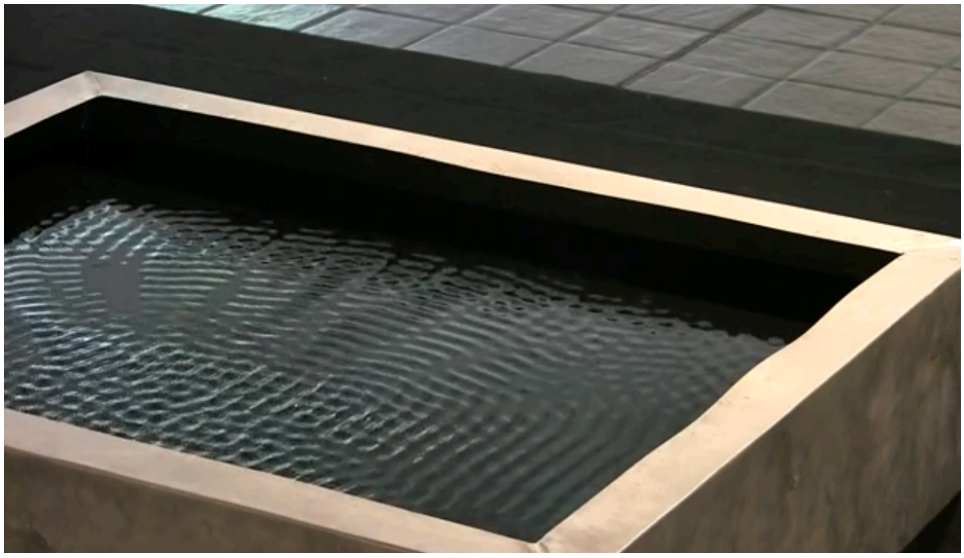
Sketch of installation within the Megahan Gallery.

I arranged the speakers up in a typical 5.1 style: the left and right speakers in corners, the subwoofer and center speakers directly in front of the listening position, and the rear left and right speakers opposite, pointed inward to the listening position. The 'sweet spot', where the direct sounds of all the speakers converge, gave the impression that some of the sounds were 'real', or, 'belonging to the space'. I was very pleased when several people told me they noticed this and that they felt as though something was in the room with them.

During the audio editing process, I kept thinking about the work of Liz Phillips. She is a sound artist from New York City who has been constructing interactive sound installations for the past 35 years. ("Biography" 1) She first became inspired to make interactive art when she discovered the way in which her movements in a space affected the white noise on the television screen. She has since been obsessed with utilizing the

movement of the observers of her work to manipulate sound. In an untitled improvisational work, Liz rigged a kitchen table with proximity sensors that ran into a computer. The sound of the installation seemed unpredictable to an extent, and Liz seemed to embrace this fact. Liz recorded an assistant cooking a meal and later used this recording when the people present sat down to eat. On the dining table, a tablecloth was placed on top of the sensors sprawled across it, and dinner was served. This was obviously not a typical dinner, and the party quite expectedly concentrated solely on the nature of the sound and how their movements affected it. As items of food were passed from one person to another, the sound would whirl, stretch and distort. Various microphones were also set up to provide a delayed recording of the room. Liz ardently adjusted knobs and faders along with her assistant in order to discover what she can accomplish in the space. This particular work utilized sensors that could detect how fast an object moves through the space, as well as how long it stayed in one position. This information is sent to the computer, which then controls how the sound is shaped and colored. ("Sound Artist Liz Phillips Makes A Screamin' Meal" 1) Although my work is not as interactive as this particular example of her work, I began to recognize how important spontaneity and serendipity are to the creative process. Seeing her work led me to alter my workflow so that I was more likely to just 'try' new ideas rather than think logically about how to arrange the sounds. The level of immersion that her work *Spectral Reservoir* must offer to those in its presence must be palpable. This work features a small body of water standing in a rectangular box. The vibrations picked up from live microphones and field recordings are made visible in the water in a very aesthetically

pleasing way. Observers can ‘see’ the sounds they make in a novel and unexpected way that unfolds in real time.



Liz Phillips. *Spectral Reservoir.* Water & Sound. 2011.

The audio in my work is comprised of manipulated field recordings and synthesized atmospheric sounds with particular attention paid to retaining a strong organic dimension to the overall sound. Conceptually, I sought to have the audio bear resemblance to sounds obtained in the natural world, though with enough idiosyncratic flavor so that (consciously or unconsciously) the observer would notice that they were not listening to an ordinary field recording. Also serving the concept of my work is the low amount of extraneous visual cues of the darkened space in which the installation stands, and the utilization of six different sound sources. I chose to use a multi channel output for the audio for the obvious reason that it is more akin to the all-encompassing aspect of sound in the uncontrolled world wherein sound can originate from a myriad of locales. Also, the sound is intrinsically striking in this set of circumstances due the necessity for the localization of the sound sources to be determined by the ear alone (due

to the darkness). During the process of mixing the recordings and synthesized sounds in my computer, I assiduously worked to retain dynamic properties within the soundscape so that the ear and mind would easily be interested by the sound that was swirling around the darkened room. When the audio does trigger the graphics, my hope is that the same attention is paid to the animation as is paid to any sound that temporarily sticks its head out of the nebulosity of typical unexamined sound. I feel that my talk of unconscious sound gives rise to a new question, which at its face may seem obvious, but could benefit from careful examination and prodding. The question is this: In what way do the sounds that do not rise to the level of rational apprehension exist? You, as an observer, are necessary for what you hear right now to 'sound' the way that it does. As I outlined above, your auditory system is essential for the recognition of air pressure fluctuations as the phenomenon known as sound. In what way do these air pressure fluctuations exist if you are not able to perceive them because your conscious attention is elsewhere? Is this as though there had been no sound at all? This is akin to the ideas raised by 18th century philosopher George Berkeley, who held that material objects in the universe only exist as ideas in the minds of those perceiving them. (Berkeley 5) After having installed my work and being asked to let it repeat endlessly to ensure that any bugs in the work would present themselves, I became fascinated by the question of how my work existed if no one was there to see or hear it. This meditation served to bolster my desire to find ways of making any potential observer of the work start to question their perceptions. There are several short tonal motifs throughout the piece that I included to cause the observer to consider the relationship between what they may recognize as music, and what they recognize as mere 'sound'. In keeping with my concept of presenting common sounds in

a way that makes them distinguished and interesting, forcing the listener to consider the placement of a tonal motif inside what may otherwise be considered mere ‘sound’ felt to be an alluring concept.

20th century composer John Cage is widely known for his controversial compositions as well as his ideas about the relationship between music and sound. Several months ago, I had the unique pleasure of hearing performances of several of his compositions during a recital at the University at Buffalo. The pieces were performed on a prepared piano (where various objects are rested on the strings of the instrument to elicit a unique tone) and were quite bizarre.



John Cage placing an object on the strings of a piano to elicit a unique tone.

I left the performance with a mind questioning the true relationship between sound and music. His philosophy was that *all* sound is music. He pithily stated that, "When we ignore [noise], it disturbs us. When we listen to it, we find it fascinating. The sound of a truck at fifty miles per hour. Static between the stations. Rain." (Cage 3) Cage defined music as the clever organization of sound. He also accurately predicted that music created by electronic instruments would cease to attempt to replicate orchestral instruments as it did in its early years, and would instead venture into uncharted territory. (Cage 4) He felt that the hegemony of the classical music education came at the price of limiting creativity and perhaps even working against nature:

> One has a choice. If he does not wish to give up his attempts to control sound, he may complicate his musical technique towards an approximation of the new possibilities and awareness. (I use the word "approximation" because a measuring mind can never finally measure nature.) Or, as before, one may give up the desire to control sound, clear his mind of music, and set about discovering means to let sounds be themselves rather than vehicles for man made theories or expressions of human sentiments. (Cage 10)

This I take objection with. I believe that human will and intentionality must reside in a piece of music in some way for it to be moving and successful. There is a phenomenon where, if one tries too hard to bend the music they are writing to their will, the work will likely be horrendous. However, I believe that some hint of the human mind is necessary in the work for it to resonate with other humans. Also, I disagree with his assumption that 'man' and human will is somehow outside of nature. Nature produced humans. Our

minds, complex as they are, are surely an aspect of nature itself. I find it strange that he studied Zen Buddhism and still maintained such a view.

Musically, I was also inspired by the compositions of Stephan Mathieu, a German sound artist and composer. He seeks to use modern techniques and equipment to salvage the remains of 'obsolete media' in addition to utilizing environmental sound. ("About Stephan Mathieu" 1) Being that many of my favorite electronic musicians are from Germany, I can firmly state that within his work there is the unmistakable 'German' electronic sound. I do not know how to describe it, but it is definitely a feeling which Stephan Mathieu, Modeselektor, and Apparat (all from Germany) posses in their works. This association caused me to consider how artists are very much a product of their surroundings and milieu. Below is an image of Stephan Mathieu's workspace where old record players were recorded and manipulated within the computer.



Stephan Mathieu's workspace featuring old record players & modern technology.

His sound is able to hold my attention despite the fact that there is little in the way of melody or rhythm. The way the textures and colors evolve and overlap cause the elements in the mix to coalesce in a very sonorous manner. Such ‘simple complexity’ is incredibly hard to engineer. It is effortless in its obscure beauty and ability to introduce palpable, indefinable atmospheres.

Unquestionably, this undertaking forced me to expand my understanding of art, sound, and their relationship to the observer. I feel that I was able to elicit the response I desired within the minds of some of my work’s observers. At the very least, I’m sure I managed to force observers to question what the purpose of the sound was in that particular space. This work was my way of attempting to communicate my own perspective on the mysterious nature of reality and the fact that ultimately, how we understand the world is a product of billions of years of evolutionary unfoldment, which may or may not be congruent with any over-arching truth in the universe (if such a thing even exists). Through sound and art, I felt liberated and encouraged to attempt to change people’s minds so that they may recognize beauty where before had only stood noise.

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