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Found Sound: Music from Non-traditional Sources
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Introduction

Problem Statement:
Sounds are all around us. Some sounds explode into noise, while others blossom into music. One is not better than the other. Sometimes the line separating these two is difficult to distinguish. Evolving from unrelated randomness to cohesive structure might only require taking it out of context, and exposing the sounds between the sounds. Beauty can be found anywhere. It is possible that melody and rhythm can come from chaos.

Objective:
To produce original music made from unrelated, random sounds I record myself. Sounds will be altered, dissected, multiplied, and reassembled to create something new. This exploration will encourage people to not only listen to sound in a new way, but to look at objects in their surroundings differently also.

Target Audience:
Gender - Male, Female
Age - 18 to adult
Occupation - Any occupation
Education Level - High School and up
Computer Experience - Beginner to expert

The End Product:
4-8 minutes of original music contained in at least one sound file. Since many of the sounds will be unrecognizable, the visuals provided will depict what the sound sources are. Ideally set up in the back sound room, the user enters and is surrounded by sound and minimal lighting.

Deliverable Medium:
CD-ROM
Target Computer:
Desktop / Laptop

Platform:
Mac or PC

Expected Software Used:
Macromedia SoundEdit 16
Possibly another sound editing program
Adobe Photoshop
Macromedia Flash

Review of Literature

Compares music to human beings in that there are never two exactly the same. It goes on to say that pieces of music are most interesting when they bring variety and originality to the basic design.

Jean-Yves Bosseur, *Sound and the Visual Arts*.
The book talks about how visual artists are incorporating more sound into their work. It also emphasizes that a double identity is created by visual appearance and auditory effects.

A more in depth look at building your own instruments from common materials was the focus of this book. There are chapters for wood, metal, skin (drums), plastic, and glass. A large section shows items originally made for another purpose can be good at making sounds.
Tom Walther, Make Mine Music. This says that listeners will appreciate music more if they are somewhat familiar with it. But, in that same vein, known sounds in new combinations will be attractive also.

Todd Winkler, Composing Interactive Music: Techniques and Ideas Using Max. This gives a brief history of computer music and its pioneers. It emphasizes the fact that some of the best work was discovered accidentally by the computer misinterpreting the data.

These books gave me a good basic starting point of recognizing the strong connection between art and music. Music is an art form itself. This includes everything from the structure of the music, down to the construction of the instruments. Music, like design, should not be exclusive, intimidating, or inaccessible.

Process

Thesis Parameters
Originally I set the rule that I had to create all the sounds myself and record all the sounds myself. That is basically what I did. However, the further I progressed in the development of the first song, the more I realized how difficult it was to create rhythm. That is when I decided to do 2 things. I recorded a friend playing his guitar and invested in sound mixing software that had numerous computer generated loops on it and was more robust at mixing tracks than SoundEdit. Both of these helped set up initial beats to build from.

Another parameter were the objects that I used as instruments had to be common everyday items that could be easily accessible to almost anyone. Also, I was looking for objects that were not necessarily made to be instruments. Drinking glasses, bottles, chairs, winter coats, and cardboard tubes were exactly the kind of disregarded, forgotten sound sources I was looking for. Different objects with a variety of pitches and sounds would help to keep the songs interesting.
Design Considerations for the Songs

I wanted to do one song that was 4-8 minutes long when I first started. This would have been a very big file to deal with, and I soon realized that doing more than one song would give me the chance to make each have its own personality. All the objects shown in the visual interactive part of the project are incorporated into the songs.

Song 1, “Mostly Glass”, includes a vodka bottle being hit with a wooden spoon, with higher and lower pitchshift applied, yelling ‘surprise’ at a party with reverb, and me rubbing my finger around the rim of a glass, with no effect applied to it. Song 2, “Dismantled Music”, opens with sounds from a toaster being put through some incredible software called Thonk, which I’ll describe in the Technical Issues section. Also, a chair from our lab played backwards with reverb, then a spray can pitchshifted higher and combined in SoundEdit starting at different points on separate tracks. Knocking out a rhythm on a cardboard box then played backwards is next, then a heavy cardboard tube pitchshifted about 3 octaves higher to make it sound like a digital beep, and finally random conversations recorded at a party and played backwards.

The third song, “Emotional Static”, opens with a trumpet being Thonked, then adds some static. Two different guitar riffs follow, one put through Thonk, the other with increased tempo. The last quarter repeats the sound of me scratching the tough outer shell of a winter coat. All three songs are between 2-3 ½ minutes long and incorporate computer generated sounds.

Design Considerations for the Visuals

Since my focus was on the audio portion, I wanted to keep the visual portion simple. From the beginning, it was intended only to do 2 things: show where all the sounds I recorded came from, and give an audio sample of the original sound and a sample of the altered version that was used in the songs. Using Macromedia Flash, and thinking simple and straightforward, I developed a grid that contains four different elements spread over twenty-four 91 pixel x 68 pixel squares. (See Appendix 1) Those elements are solid
colors, thin, animated stripes, the letters “H”, “W”, “Y”, and “O”, and images of sound sources.

The solid color areas provide a contrast to the numerous different images used throughout the grid. They help prevent too much white space from showing, and their vividness enhances the multi-color theme. The animated stripe sections have many functions. They provide some constant motion to the piece. I think subtle animation can be very effective. Also, the placement of these three sections, horizontal at the top and bottom, vertical in the middle, help lead the eye around the grid. They also act as a gathering point for most of the colors used.

The last two elements of the grid, the letters “H”, “W”, “Y”, “O” and all the images of the sound sources, are clickable buttons. I put each individual letter on a plain white background so they would stand out. There is a lot of color and imagery used throughout the grid, so the way to get attention and have legibility is to have them on “empty” squares. On rollover, the letters display what they stand for.

The “H” is for How, “W” for What, “Y” for Why, and “O” for Who. Clicking these brings up brief text explanations of how I made the music, what my thesis is about, why I chose this topic, and who or what has inspired me to do this topic. The text itself is alternating lines of light blue and dark blue colors. (See Appendix 2) This provides good contrast from the white background and making each line of text different from the one above or below it, makes it easier to read.

The final element of the grid is all the sound source images. All of these objects are used at various points throughout the three songs. I took all of the photos myself, except for two. I wanted shots that were kind of minimal, sometimes a little abstract, but usually pretty obvious as to what the object was. Putting them on a solid background helps to keep the focus on the particular object. When clicked, a larger image of that object appears next to the grid. (See Appendix 3) That larger image would sometimes be the same, or sometimes I found another angle that was just as good. To keep with the style of the piece, the larger image is also that specific object on the same solid background.
All the text is lined up with the right side of the large image. (See Appendix 3) The top line tells what the object is. The words “Original” and “Altered” are below the caption. When clicked, these words play a sample of the original object sound and a sample of the altered object sound that can be heard in the songs. Many objects were able to have more than one original or altered sound produced. An interesting side effect is that multiple original sounds or altered sounds can play at once, creating more combinations and accidental rhythms.

The Opening page is also the Help page. (See Appendix 1) There are question marks on every page that, when clicked, display the simple instructions shown on the Opening page. In general, the colorfulness is meant to invite people to interact with the piece, and to convey a sense of fun and approachability. The grid layout gives it structure and a feeling of organized randomness.

Technical Issues
The recording quality of my sounds was very good, but studio-made soundtracks and albums have an exceptionally clear sound I found hard to duplicate. I mainly used the small standard Apple microphone and a full size battery operated hand held microphone. The full size mic plugged into a mini disc recorder, both borrowed from the IT department. This made it easier to go to find sounds, rather than bringing the sounds to the computer. Ironically, sometimes a poor recording can make an extremely unique sound.

I used many of the effects SoundEdit supplies, in different combinations and amounts. Since audio was the main focus, I kept all the sound files at 16 Bits/44 kHz or 16 Bits/22 kHz. This meant bigger file sizes, but also the best quality sound. I was fortunate enough to take Dr. Biles’ Digital Audio & Computer Music class in the IT department. It really gave me an understanding of the history of computer music and a good dose of the technical side of sound. It also introduced me to a crazy little software package called Thonk. Created by AudioEase and free to download to Macs, it would completely distort any given sound file beyond recognition. The process could only be
started and stopped. The only control I had was choosing the effect, and I didn’t know what the effect was actually doing to the sound until I heard it. It is a very basic program, but it produced some of the best sound samples I used.

Troubleshooting
I think one of my earliest problems was not realizing that it was helpful to count beats when creating a song. I haven’t played an instrument in a number of years, so counting didn’t occur to me until a classmate pointed it out. I had no problem knowing what sounded good in a song, and knowing to count 1 to 4 beats or 1 to 8 beats, gave me some structure as to where to introduce new sounds or end old ones. To keep the songs from sounding too abstract, I realized I needed some computer-generated sounds that maybe might be easier to repeat or establish rhythms with. Initially, I was against using anything but sounds from objects I recorded. However, I think at this point in time, society is used to hearing digital beeps, bass, or symbol sounds in their music. Since I wanted some degree of familiarity for the listeners, I decided to incorporate some computer-generated sounds into the songs.

On that note, I bought music mixing software, called GrooveMaker, which also came with hundreds of sound loops that were royalty free. With this software, I could import up to eight different sounds I recorded, change the bpm (beats per minute), pan left or right, and then produce a sound file that contained all those elements. I could also mix my sounds with the loops that it came with. All the loops were structured around the eight beats count, so the software automatically conformed my imported sound to that count. This made the mixing easier and let me focus on finding the right sounds. I thought this would prevent me from having to mix in SoundEdit, but I was wrong. Each program has advantages and disadvantages and SoundEdit was better for combining different parts of a song into one long song. GrooveMaker could only accept sound of a few seconds in length. I didn’t think to find out that information beforehand.
Summary

During testing users found the grid easy to use and understand, with good variety and placement of images. There was positive feedback, and some amazement, at how foreign or mysterious the sounds from everyday objects could sound. Users also liked the idea of having the original sound near the altered sound for comparison.

Conclusion

This project is hopefully making people look at their surroundings, and the objects in them, differently. To try to see, or hear, beyond the surface, something that might not be readily apparent, is the goal. I have always loved music. I didn’t want to pass up the chance to create some of my own. Also, at the end of the first year, I remember reading that a thesis should cover new territory and push the boundaries. That thought is also part of the reason I was aiming for a mostly audio thesis.

Doing this project generated many new questions. Are traditional instruments obsolete? Is anything lost by using strictly computer-generated instruments? Will it sound too sterile, mechanical, or unemotional? I believe traditional instruments will never be obsolete. I like to think society will always appreciate and value the time and talent it takes to play them. Current computer-generated sounds that mimic traditional instruments are very accurate. They are sounding less and less mechanical, but could sound computer-like and unemotional if the composer wanted.

Can music creation become too pedestrian? Does dissecting the art form to the lowest common denominator cheapen it? With the relative ease of access to computers, I think more people have the potential to make music. This can only be a good thing. While this will result in a lot of bad music being made, it will also create much new and exciting
work that is truly original. Of course, whether something is good or bad will always be subjective. What I mean by the ‘lowest common denominator’ is music created not by a Julliard trained pianist playing at Carnegie Hall, but rather someone tapping out a contagious rhythm on a plastic bucket with drumsticks, on a street corner. Isn’t it basically the same thing? I think these two people arrive at the same destination by taking different directions. Music is not cheapened by reducing itself to the lowest common denominator, it is actually strengthened by showing its ability to encompass many forms.

Appendix

See attached sheets.

Bibliography

Books
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Bosseur, Jean-Yves.  
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Davie, Cedric Thorpe.  
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Walther, Thomas.  
Make Mine Music.  

Winkler, Todd.  
Composing Interactive Music: Techniques and Ideas Using Max.  

Software
Kevin Mullet
SoundEdit 16, Version 2
Macromedia

Arjen van der Schoot
Thonk_0+2
AudioEase

IK Multimedia Productions
GrooveMaker 2.0
IK Multimedia Productions
Websites
The following streaming audio sites were good musical inspiration. Whenever I got frustrated or was afraid that it sounded wrong, these sites really helped get me motivated and reenergized. They are all found under the Electronica category on the *iTunes Radio Tuner*.

Bassdrive
http://www.bassdrive.com

Chemlab
No site listed.

Factory 188
http://www.factory188.com

Groove Salad
http://www.somafm.com

Geekbox 3
No site listed.
The 24 square grid with solid colors, animated stripes, letters with explanations, and images of sound sources.

Click on an image to see sound source or thesis information.
HOW I MAKE THE MUSIC.

Glass, steel, cardboard, the rush of spray from a can, conversations between people at a party are all familiar types of materials and sounds. Now imagine a two second bit of that sound at a higher or lower pitch, then played backwards and repeated for twenty seconds. It can become so abstracted as to be unrecognizable. Almost any sound had potential to be used.
This is the larger image of the vodka bottle with caption and clickable sound sample links below.