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A Music Composition Through the Use of Animal Sounds

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A MUSIC COMPOSITION THROUGH THE USE OF ANIMAL SOUNDS

by

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Abstract

The knowledge on animals has been studied over many years by researching and understanding animal behavior and creativity with music. Bioacoustics shows a great deal when it comes to collecting sounds through many principles for sound data collection. With saved recording of animals, music, speeches, and so much more, it has impacted the way music is created through technology. Music production has been advancing in many creative ways. The foundation of sound manipulation is musique concrète. The project uses these concepts of audio recording and digital sounds to produce a composition that includes animal sounds.

Keywords: Animal Sounds; Bioacoustics; Biomusic; Music Production; Musique Concrète

Acknowledgments

I would like to give thanks to my mentor, Dr. Timothy Chenette, for being my mentor for my honors capstone project. I had a hard time finding a mentor and he helped support my idea late in the semester. Thanks to his time, knowledge, and willingness to help, I was able to create a masterpiece. He gave no strict protocols to align to, which has allowed me to use so much free will and imagination for this creative project.

I would also give thanks to my friends and people to whom I shared my music with and attended my presentation. I really enjoyed the reactions, support, and feedback from them. I would hope to release my work on a streaming platform, as a suggestion from someone during my presentation. And hopefully I would be able to share the rest of my music projects out to the public.

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Introduction

The production of music has so many possibilities, as the use and imitation of animal sounds can be found in many music pieces. I aim to use animal sounds to create a music composition that incorporates modern music production. I see my project as a challenge to try to incorporate animal sounds into music that is used in multiple creative ways. Animals create an array of sounds that are fairly studied. These studies help us understand the behavioral aspects of sounds and an animal's understanding of music. The incorporation of animal sounds and audio effects into music has been developing through the innovation of recording technology. With such knowledge and advancements, I will then explain the inspiration and process of my final music product.

Bioacoustics

Animals create a variety of sounds to vocally communicate or produce natural physical sounds such as flapping wings. Bioacoustics is the study of sounds in animals. The research around bioacoustics is the relationship in the behavior of cognitive science and mechanisms of production of acoustic sounds (Gentry et al., 2020). Cognitive science is the study of processing information and bioacoustics research, which is easily and heavily studied with birds. This allows science to try to answer the why's and how's animals make certain sounds. Birds have been shown to produce an array of vocals. This allows the study of cognitive behaviors, especially when studying the behaviors of songbirds and parrots that can mimic human speech. The study of bioacoustics would account for variables to determine the behavior of a certain species: timing, spatial distribution and signaling location, environmental conditions, population variation, demographics, social context, and individual differences (Gentry et al., 2020). The raw recordings of many animals can be used in cognitive research to understand behaviors. These

recordings are great for many purposes of using sounds for research, but the principles of obtaining recordings can be applied when selecting desirable and unique sounds.

The relation between music and humans and between animals are understood differently. Studies have also analyzed the outcomes of music or musical stimuli on animals, including measurements of preference, discrimination, improved welfare, and physiological responses (Snowdon, 2021). Music has so many effects based on the tempos or the type of emotion the piece conveys that can be highly attributed to the same behavioral response associated with the type of music. With a long history of music humans have developed an adaptation to music that helps with social cognition that is not translated to animals with the same context (Snowdon, 2021). Humans have developed a high universal understanding and language of sound through music. This development allows humans to increase their social capacity more than any other species. When music is introduced, animals do not fully understand the concept or convey the emotion that is being played.

Even though animals do not fully understand the complexity and context of music, there are some components to music that are able to be comprehended. The ability of beat perception and synchronization is "defined as the ability to perceive a beat in music and synchronize bodily movement" (Patel et al., 2009). This can be observed as a bird or any other animal nods their head to a rhythm or beat to music. The evolution of human music is not understood in relation to animal cognition and animal evolution. There are still a lot of questions that revolve around this study, yet we can see rhythmic function without music when birds perform courtship.

Biomusic and Musique Concrète

Biomusic is the recording of sounds of animals or plants that is incorporated into music or the sounds created by biofeedback such as an actual heartbeat (Brumm, 2012). There is a vast

amount of music that tries to imitate the sounds of nature and animal sounds through the use of instruments. The concept of actual animal sounds used in music came around in the 1950's with the concept of Musique Concrète (Brumm, 2012). Musique Concrète is the use of recorded raw sounds and being able to apply audio effects and manipulation techniques into a new sound. The use of raw recordings were manipulated in ways people could not imagine during the years when radios were playing music in the early 1900s. There were various techniques to manipulate recordings such as speeds, loudness, and mixing (Palombini, 1999). This can be seen today with modern music production and especially DJs. The use of raw recordings of animals developed over the years to create meaning and use in music. Many examples include the use of bird sounds in many introductions to facilitate a calm nature to a section. Lion and tiger roars give a sense of fear and power to a piece. Many animals' sounds create this unique feature in music to leave more emotion and structure to music.

Composition

Today, anyone with access to technology has the ability to produce music. Music production projects contain skills that usually require recording, sequencing, editing, effects processing, and mixing (Fick & Bulgren, 2022). With such advanced technology there are many software programs that allow people to make music on their phones, tablets, and computers. Raw recording of sounds can be used to produce music and many recordings such as an entire orchestra playing, a person singing, or someone playing one instrument. Aside from using multiple recordings that can be used to create a piece, sounds can be sequenced to produce sound patterns through the software program like pressing a button on the keyboard to produce a violin sound of various pitches, chords, or a melody.

Several producers who work with instrumental sounds and even animal sounds provide useful inspiration and models for this project through the use of musique concrète. An example of using raw sounds and general music production can be found from a YouTuber named Kurt Hugo Schneider, a music producer. In some of his creations he recreates samples of popular music by recording regular objects such as the sounds of doors and kitchen utensils. With these recordings of sounds he combines them with standard music instruments to create the final product. This idea has helped me put raw recordings of animal sounds into a product by possibly using them as beats and understanding techniques that can be used in musique concrète. Yet another producer, Meredith Bull gives a great example of incorporating animal sounds or recordings into music. In one of her songs, "Come Back Soon," she uses a cat sound from the internet, usually from TikTok. With the recording, she reuses and chops the sounds into fragments of repeated loops to create a melody or rhythm. This gave me ideas of how I can manipulate the recordings into a piece of music. As she was able to find cat sounds on the internet, I have also used the internet to find various sounds other than cat sounds.

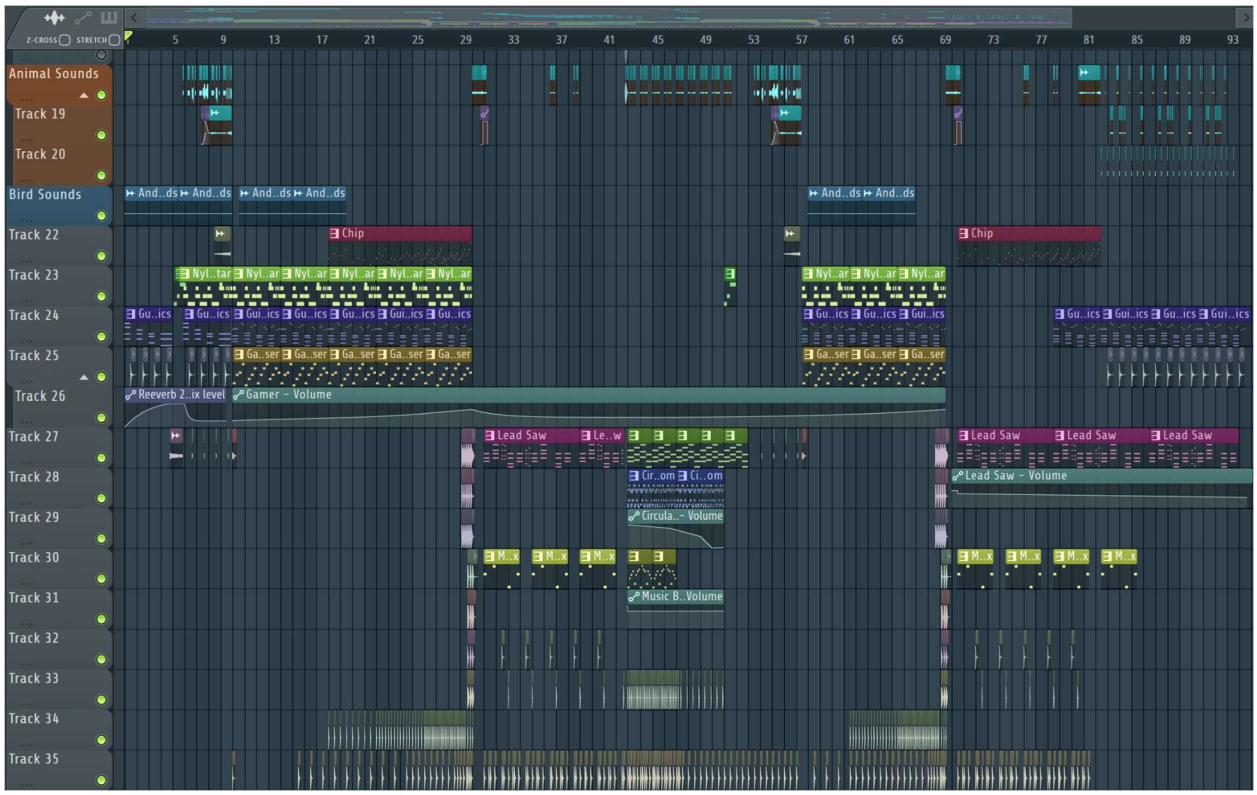
With the concepts these producers can use I am able to complete my music production piece and project on a computer software called FL Studio 20. The style of the piece is electronic dance music in the sub-genre of future bass. Future bass is an influence of trap music and the use of bass synthesizers (MasterClass, 2021). The animals' sounds were found mostly through YouTube and converted from a video file into an audio file. This conversion was done with the help of a website called Y2Mate. Among using raw recordings and creating sounds, the advancements of technology enable me to further manipulate and produce certain audio effects. These audio effects are considered essential tools to enhance the quality of an audio or creative

sound design (Wilmering et al., 2020). These tools are found in the software that I use, which has enabled me to create detailed and dramatic effects in various parts of my piece.

The piece is composed of an introduction, build up, drop, and then a variation of the introduction, build up, drop, and a breakdown. The image below shows an overview of the entire project and its contents of animal sounds and instruments. The desirable sounds are selected through the principles of sound recording of bioacoustics. These animal sounds are collected within the copy right of fair use: to transform the audio into something new and only small amount of the audio is selected from the original.

Figure 1

Overview



Note. An overview of the entire project that contains elements of different sounds used and arranged. Measures (M)1-9 is the Introduction; M 10-30 is the Build Up; M 31-52 is the Drop;

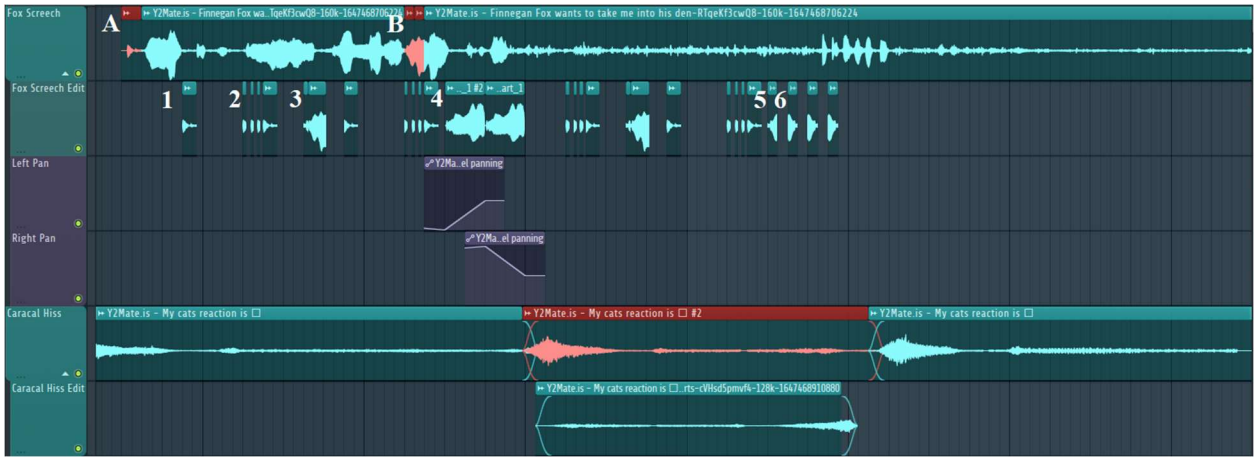
M 53-70 is the Introduction Variation; M 70-82 is the drop variation; M 82-94 is the Breakdown Variation/Outro.

Introduction

The introduction of the piece starts with a guitar harmonic synth chord, nylon guitar melody, a raw recording I collected of bird sounds from the Hogle Zoo in Salt Lake City, Utah, and then the internet recording of fox screeches is added with an ending of a caracal hiss combined with a riser cymbal. The raw fox screech recording was segmented into desirable sounds: A and B. Pattern 1 is created with segment A. Pattern 2 is created by cutting off the beginning of pattern 1 and repeated three times with the use of pattern 1 again. Pattern 4 uses segment B which was stretched to make it longer. As pattern 4 is stretched, the pitch changes to a lower tone. With the lower pitch I altered the pitch higher to make it sound back to the original pitch. In addition to pattern 4 I used an audio pan so that the sound would come from the left side to the center and right side to the center. Pattern 5 is created with the beginning half of segment B. Pattern 6 is a reverse version of pattern 5. The raw caracal hiss is segmented from the middle then reverse to create a riser and faded out to adjust the density and volume.

Figure 2

Fox Screech and Caracal Hiss



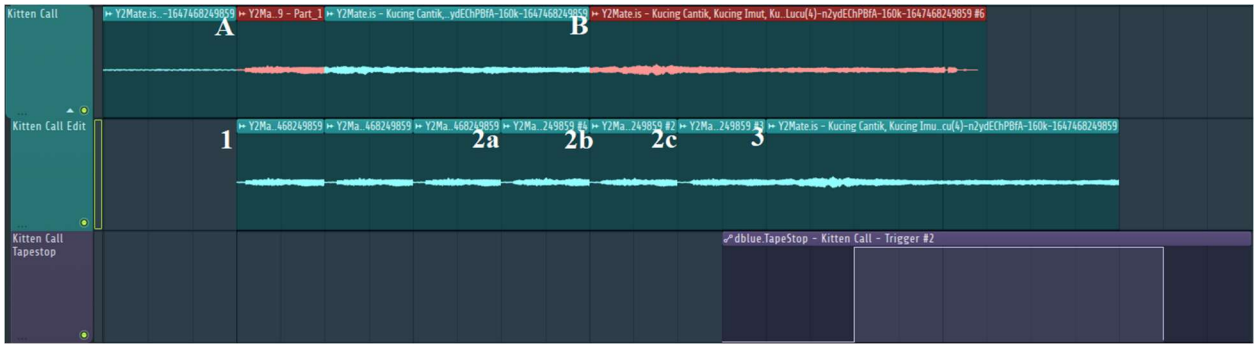
Note. Displays audio of Fox Screech and Caracal Hiss and their respective edits and effects. Audio highlighted in red is the original audio that has been selected and segmented.

Build Up

The build up is continued with the same nylon guitar, guitar harmonic synth, and bird sounds with an addition of a gamer synth that creates an upward motion with pitch and volume. The chip synth melody follows the rhythm and speed of the beat. It ends with a climax beat drop of an internet recording of kitten call. The raw kitten call recording was segmented into desirable sounds: A and B. Segment A is used for pattern 1. Pattern 2 reuses segment A and is altered to lower in pitch by -100, -200, and -300 respectively. Pattern 3 is taken from segment B and then altered with the use of a tape stop to reduce the speed and abrupt cancellation of the recorded sound.

Figure 3

Kitten Call



Note. Displays audio of Kitten Call where the red is the selected segment audio form the original and respective edits and effect.

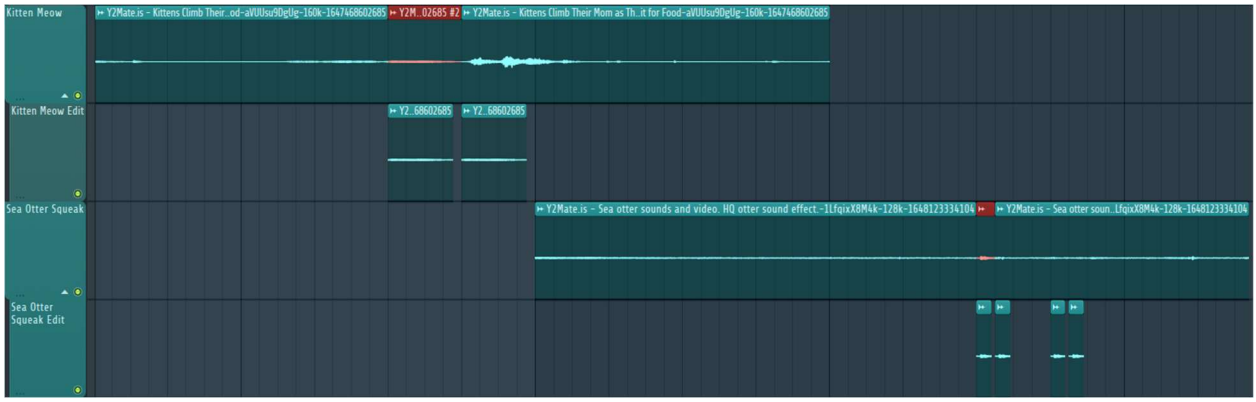
Drop

The drop becomes the core of the release from the tension of the build up. It uses a lead saw with the highlights of a kitten meow and sea otter squeak. The kitten meow and sea otter

squeak were segmented into one desired sound respectively and not altered. A transition is made with a break of a dog whine that is followed by a cat meow and the use of electric guitar chords, chaotic pattern of circular saw, and music box melody. The cat meow has been segmented into one desired sound with a crossfade audio transition. And lastly dog whine has been segmented into one desired sound that has been stretched to fill time and have a perception of being slowed. The drop fades away with a reintroduction of the beginning of the piece.

Figure 4

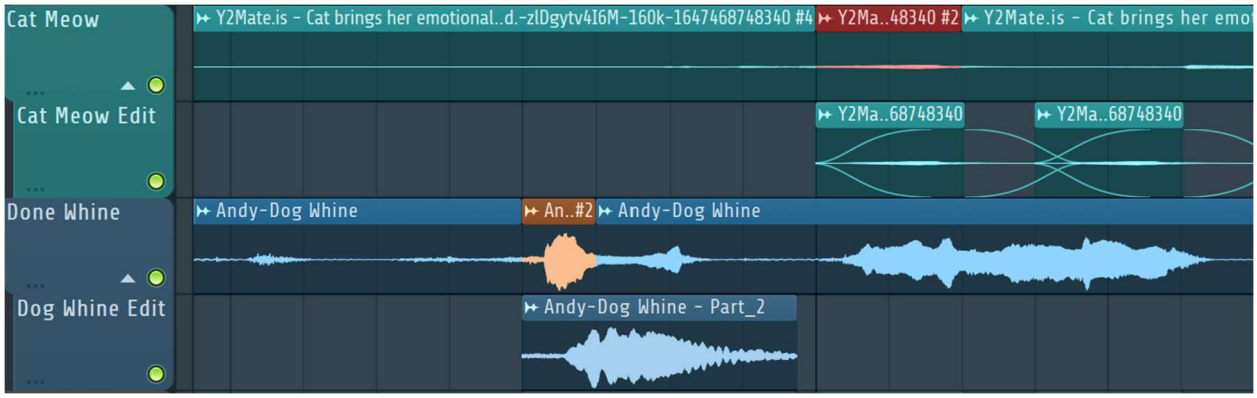
Kitten Meow and Sea Otter Squeak



Note. Displays audio of Kitten Meow and Sea Otter Squeak that has been segmented from the original audio highlighted in red.

Figure 5

Cat Meow and Dog Whine



Note. Displays audio of Cat Meow and Dog Whine that has been segmented from the original audio highlighted red and orange respectively.

Variation

The introduction is played without the use of instruments, which allows the fox screech to stand out with the use of the caracal hiss. The build up is shortened and the use of the chip synth is placed into the drop. The drop merges into the breakdown. The breakdown is transitioned with the help of the caracal hiss and use of the same guitar harmonics. The addition of the first part of fox screech pattern 2 follows a constant rhythm as well as the sea otter squeak; and the cat meows follows the guitar harmonic higher tones. The breakdown then slowly fades away with the last note of the guitar harmonic.

Animal Sounds Used

- Fox Screech (SaveAFox, 2022).
- Caracal Hiss (DontStopMeowing, 2021).
- Bird Sounds (Recorded by author at Utah's Hogle Zoo on March 10, 2022).
- Kitten Calls (ViralSnare Rights Management, 2021).
- Kitten Meow (BVIRAL, 2022).
- Cat Meow (Unable to find video anymore).
- Sea Otter Squeak (The Animal sounds, 2021).
- Dog Whine (Recorded by author at Cache Meadow Vet Clinic on March 18, 2022).

Conclusion

The purpose of the project was to understand the use of animal sounds in the field of science and how it can be applied into music. The bioacoustics of many animals have been studied to understand the cognitive behavior and functions behind many sounds that are produced. And much of the studies are not fully understood and left many new questions to explore between the relation of music and animals. Yet in modern music, there has been an advancement in technology over the years. This advancement creates a new field of manipulating sounds that enhances the creativity and expression of music. With the development of many studies and technology, the final product was to produce a music composition that is able to use animal sounds.

Video Link of Final Product

https://youtu.be/dLVNt_4FOVk

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Reflective Writing

As I started to brainstorm my ideas on what to do with the capstone project, I thought that it would be amazing to combine my interest with music and animals. I was reminded that I can try do something creative rather than a heavily methodological science project. I came to the conclusion that I wanted to try to enjoy working on a project rather than thinking about finish a task after another. After learning how to make music, I started to really enjoy what I was making. I really had a rough start along with finding a mentor. Most of the late start was my fault and not being on top of things, but I was able to find a mentor that was willing to be part of this project. Having a late start was a bad idea, but it would be a good idea to get things started early so you can plan and have more time to complete any other finishing touches.

During my time of getting inspiration for my project, I thought it would be amazing to collect my own recordings of animals. So, I decided to try to get some dog or cat sounds form the veterinary clinic I work at. I did not get a lot since there were too many noises from the pets. I wanted something clear and distinct to be able to edit into a beat or sound. I also went to the Hoogle Zoo in Salt Lake City to record some animal sounds, but it was not the best timing. It was snowy and there was a big elementary field trip. If I was going to record some sounds, there was going to be some background noise of children. I visited the elephants to try to collect the sounds they would make, but they were just eating. I walked around the entire zoo to try to record some animal sounds, but many of the animals did not make any noises and I did not want to provoke them. The only recording I was able to collect was bird songs.

After the process of obtaining animal sounds from my adventure and the internet, I got stuck on how I would be able to incorporate such sounds into a music piece. But Merdith Bull gave me ideas on ways I can use my recordings. Next was trying to figure out the style of my

music piece, so I listen to so many types of music to get an idea. Luckily I came across a playlist of future bass music that I would get inspiration on sound design and structure: listening to each piece carefully and how they incorporate instruments, transitions, vocals, and recordings on repeat.

During the process of putting my piece together, I really want to add an amazing build up and drop. The build was not fully developed, but the transition into the drop was incredible. I was in awe and thought to myself, “oh my goodness, I just did that!” I was amazed with my ability and the section I was able to make. I would hit repeat for hours listening to the beat drop. This made my progress to complete the project to a halt, since I got distracted from the output of the drop. I was jamming out so hard that I was in this writing block phase, where I was unsure how I can continue the piece at its peak. So after the hype listening to the drop on my desk and chair, I decided to listen to more future bass music on repeat and think about how I should continue my piece.

After finishing my piece, I wanted some feedback from my friends before having it declared as completed. I was surprised and happy from people’s reaction. A lot of people seem to enjoy what I made and surprised I was able to accomplish such a piece. Some of my friends say that it gives off *Euphoria* vibes, Which I do not quite understand, but I know it is from a popular Netflix show. One other person said it was too much for them that it was not their style. Their dog seemed to not enjoy my music piece, as the dog started to bark furiously at the music. As people listen, I took note whether people recognized animal sounds. A couple of people did not recognize that there was any type of animal sound, unless I told them that there was. After saying that there were animal sounds, they would only recollect cat sounds. After explaining the list of animals sounds I used, there were shocked and confused. In another group, I told people that

there are animal sounds in my piece then listen to my music. There were just generally supportive and amused in the product. They did question and surprise how I could have incorporated animal sounds into a piece.

Overall, the project was a journey of confusion, struggle, and hype. It is a piece that seems out of the blue. But thinking about other music that has been published that also incorporates animal sounds is out there, I am pleased about the creativity that can achieve and sought. Listening to more music and techniques producers used made me want to add them into my piece. I was considering doing vocals, but I have a hard time listening to cringy recordings of myself trying to sing. But there were so many ideas that I really liked, I wish that I had more time to put in the work and detail for the piece of the new ideas that came along. Throughout the making process of my piece, I was also thinking other techniques that can achieve different sounds such as vocoders and EQ equalizers. With that in mind, I am excited to apply so many new techniques into my other unrelease and new projects to come. I always thought about doing a non-creative research-based project, but I am glad that I was able to do something creatively and enjoyed the process of making and sharing my project.

Author's Biography

Andy Nguy graduated at Utah State University in May 2022 with a Bachelors in Animal, Dairy, & Veterinary Science with an emphasis in Bioveterinary Science and minors in Behavioral Health, Biology, Chemistry, and Music. During his years at Utah State University, he was a peer mentor for the Connections Course and Aggie First Scholar Program. Along with academics, he was able to help around Abby Benninghoff's lab and Amita Kaundal's lab as an Undergraduate Research Fellow. He has also volunteered with Campus Kitchen partnered with SNAC Pantry to provide food to students on campus. He has also performed with the Cache Symphonic Orchestra as a second violinist and continued his studies with piano. He plans to continue his career as a veterinary technician and assistant at the University Veterinary Hospital & Diagnostic Center and hopefully start a future career as a veterinarian and a music producer/songwriter, and possibly be involved around esports.