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**Individual Evaluation**

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## 1 Introduction:

Every new experimenting project leads to very different types of approach, as a result even mistakes are considered as a part of the project. In this individual evaluation, I am going to evaluate my group project which includes three more people; Adam, Henry and Ioana. Everyone in the group holds an essential responsibility to make this project as efficient and successful as it is. Group projects help to make you understand the liability of being in a professional environment. This project is an installation which we have named as 'Verdure Sounds', as the name describes the motive behind the project, 'Verdure' refers to something fresh, lush and green which sits perfectly with the property of music we were looking for. The idea began with grasping sounds out of plants which can be used for many psyches related treatments and meditation. After thorough research and studying about different aspects of involving sound with nature, these sounds are also characterized in two different ways like 'Consonant' and 'Dissonant'. It was essential for me to understand the difference between them.

I realized that in our daily life we listen to numerous types of sounds, but some catches our attention, whereas sound can be bizarre and can be unpleasant to our ears as well. Some ear pleasing sounds are known as the Consonant and unlikeable sounds falls into the category of Dissonant features. The context of each sound is different in aspect of musical, psychoacoustic, or sensory consonant/dissonant. With musical context, it is recognised by most of the humans easily as it can be judged in terms of harmony and melody or in some case the pitch of the sounds, but with sensory, the sounds are heavily dependent upon the musical training. Being a music student, this research also helped me understand some interesting facts about the range and quality of the sound as well. Understanding various aspects of music helps me improve as a composer. After signing up to doing Film Music, this research has really been helpful to make me understand the depth of sounds, as in the film there are vast variety of aesthetic music to make the audience feel connected to the movie. This topic also involves the gist of Neurophysiology, which supports the topic to understand how human brain conceives

sounds. There are fundamental frequencies of the tones which is divided in various manners, consistently increased volume makes tone very wet (with the use of many effects) and dissonant. The way I represented the dissonant sounds in the project is in the musical context, as we already have the originally composed tracks for the project.

## **1.1 Aims and Objectives:**

For this project, our team wanted to create our own immersive musical environment with the help of visuals and audio effects. Such things are rare to find, which will help to provide peace in the form of music and healing with visuals. We found it quite interesting that with the help of our past musical experiences and tech background, we were able to achieve this task. The birth of an idea came from the word 'Ambient', and all four of us wanted to do something which is vibrant and calm. Each one of us were assigned to do something which related to our history, which I found very helpful as the outcome was remarkable. Signing up for something which is different from what anyone is doing can be challenging, especially when it is with a group. Coming from a performing and composing background I was assigned to do the 'Dissonant Sounds' for the project, which helped me experiment with confidence. After hearing a lot of news about our mother nature being deprived because of global warming and Amazon Forest being on fire, this kind of triggered the idea to do something related to nature. Involving nature in our assessment came with lots of ethical research, as we had to make sure of many things which involves not to harm any plant as well. Also thinking on the larger scale, we had to make sure that it is legally advisable to use plants in such installations project.

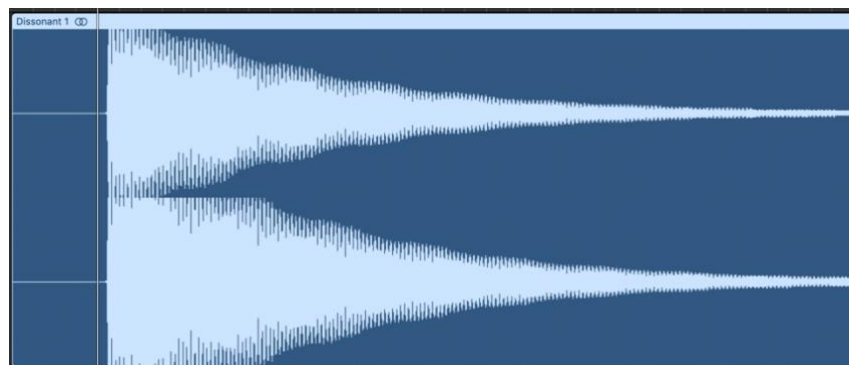
For our group presentation, I was assigned to research about the ethics and legality aspect. Cohesive ideas became one with the involvement of nature and music together, however, the task was to implicate the whole idea to reality. Adam and Henry have a strong background in dealing with installations and Arduino coding which was an advantage for the project. Ioana and I took the responsibility for the whole musical side of the project, as we both come from composing background. Ioana's brother is an architect, therefore he designed a 3D model for our project which really helped us understand the major look of the installation.



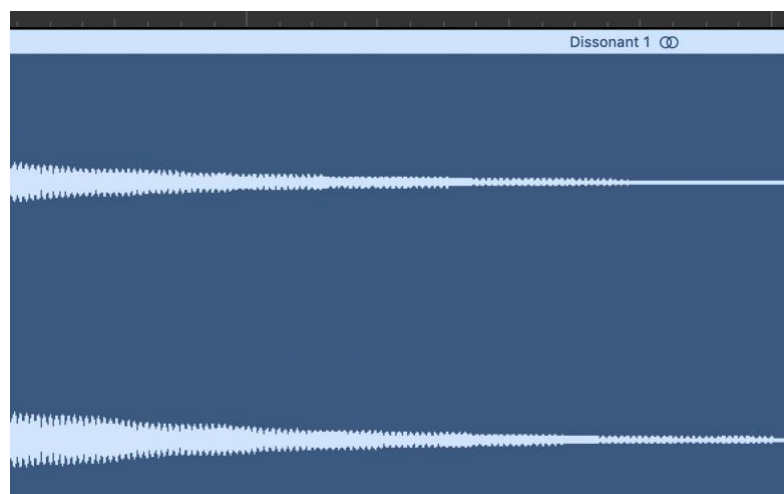
After achieving the first look of our project, it gave us the confidence to be more precise about the detailing of the installation, as it requires many resources to get it done. Such installation can be used in museums and music festivals to portray a relaxing sensory environment, also in lectures of how to manipulate the textures of sound with the help of plants. The whole idea also raises some awareness about 'Save nature', as our environment has no voice to explain their pain and threat from humans. It also signifies the relationship between the human and the nature. It was like providing voice to the nature. Various types of sensors have been used to measure the data of the plant's humidity, such as touch and light. From the measured data, we controlled the change in sounds, for instance, more humidity effecting the frequencies or similarly if the plants been touched, they make a dissonant sound which again relates to the awareness of saving plants. The composition itself is a mixture of vibrant sounds which includes drones and looped white sounds from nature, which connects with our daily life sounds for e.g., birds chirping.

Airy melodies and rhythms resolving in dissonant sounds, also the synchronization of the sounds with actual footage projected on white sheets. After many trials of using sensors with different objects helped us understand the mechanical behaviour of the sensors and primary behaviour of manipulated sounds. Besides all sensors, we also tend to use the soil moisture sensor, which helps us measure the soil temperature which again gets manipulated by sound designing. Both dissonant sound is different as per the requirement of the loop visuals and composition and to cover all the frequencies, the sounds have various form of sustain and intervals.

Dissonant 1 (Please see attachment in the e-mail) covers the high frequency area. There is sustainability and intervals in the sound to give space to the composition as well. I did not want it to sound like an alarm which will sound just like replicated noise out of any plant, hence, I chose the high frequency for this one as it literally pricks your ear.



*Figure 1: Dissonant 1*

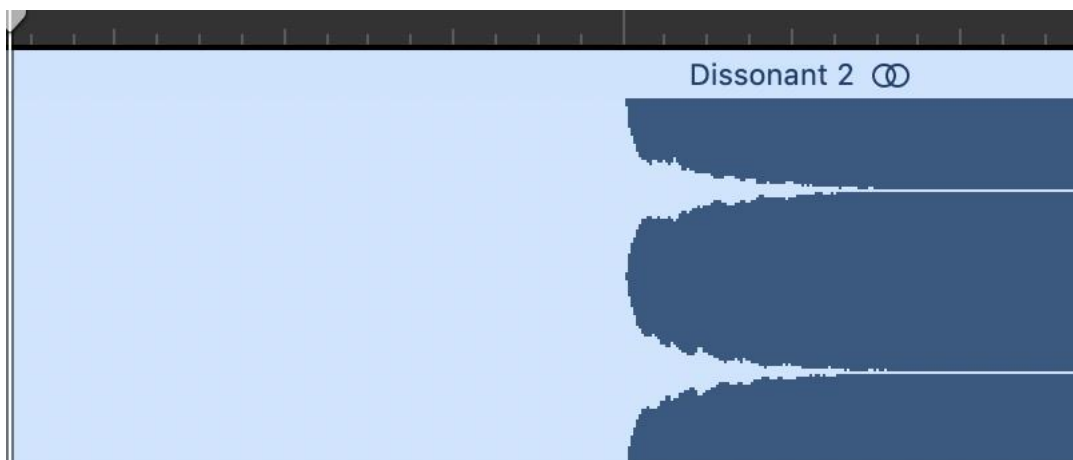


*Figure 2: Dissonant 1.*

In the second image (Dissonant 1.1), the sustain noise is pretty much visible. But with the Dissonant 2, I changed the frequencies to cover up the low ends as well. This sound has no intervals in the middle, it does sound very dramatic. In this one, I also changed the notes; or else it might sound too monotonous. This one has a very low frequency as the difference between two are clearly visible. With 1, I added one out scale note if you listen to it carefully, no sustain in the sound. They might get played simultaneously, by keeping that in mind I composed the sounds.



*Figure 3: Dissonant 2*

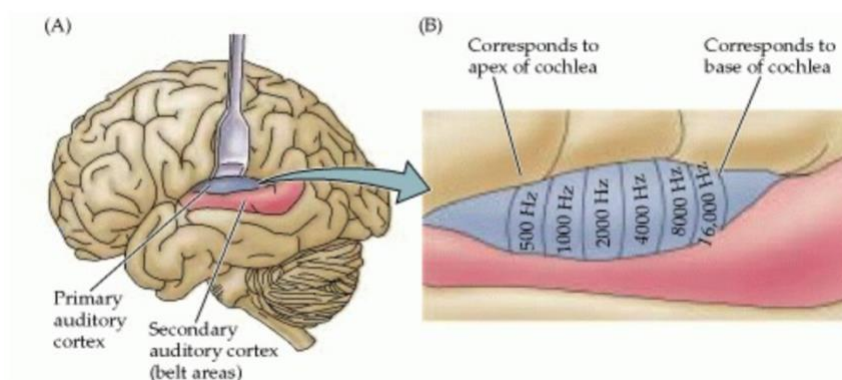


*Figure 4: Dissonant 2.1*



## 2 Research:

Exploration for this project was interesting in terms of understanding the different side of music, which includes neuroscience and many other fundamental points to increase my knowledge in music field. To begin with, I started understanding the 'Auditory Cortex' of humans. Auditory cortex is a part of the brain which stimulates auditory information to the human brain, processing of sound occurs in this area. This is the same part of our brain which help us translate languages. There are various ways in which the cortex functions.



There are multiple behaviours through which cortex conceives and processes sounds, and reflex is one of the major behaviours of receiving sounds from the outside world to the brain. When sound hits our ears, the reflex occurs in the cortex which conveys the temporal sequences of sound to the brain. When brain is familiar with the sounds, the behaviour in cortex is different than listening to the unfamiliar sound, best example of this is listening to the language which unfamiliar to your brain and culture. The reason I did this research about human brain and auditory cortex is because, when I was being told to compose a dissonant sound which is not music it's the sound. For me, it was important to understand how things change when there is a difference between composing a melody or a sound, with making sound that is totally a different subject from what I tried to pursue. I just experimented with frequencies of the effects by using Logic Pro X, playing a chord, and playing a sound is the same. This can be debatable under many circumstances.

My idea was to understand the dissonant sound and how the human brain perceives and processes it. It may sound a bit bizarre that only 2-3 second sound needs this much of

deep analysis of human brain, but there are many articles and journals on understanding human brain and music. This project also provoked me to be precise about my work, and when you gain knowledge about your own body, this sometimes makes a big difference. My way of composing music or mixing and mastering music has totally varied after understanding some great facts about human's cognitive behaviour. There are so many things that we humans are unaware of as it never affects our lives, and many facts and studies are still on-going on to create awareness amongst humans about their own body parts. Musician brains and non-musician brains works in a very different way and so is the cortex compartment, as these changes make a big difference in the mental behaviour of a human in normal life as well.

As we all know musician's brain is a faster translator than a normal human brain reason being, musicians are familiar with technique of translating symbols into a musical note while playing an instrument. The research is still on-going to monitor all the differences between the musician and the non- musician brain. There are many multimodal sensory and feedback mechanism of brains which develops with skills. The development and motor information may vary with different instruments, and each instrument requires a particular skill set to master that instrument. Majority of the studies and research includes piano players, major reason behind this can be the involvement of theory and staff notation practice. Every instrument includes theory and reading notations but for a good piano player this skill is at extreme level, thus they are chosen for such studies. Many positive correlations have been proved by researchers studying musician brain, but still the study continues. There is no competition which brain is better, but it is important to know the biological behaviour which effects your daily life.

Sounds and Music is no less than any medicine which helps people make their lives better. This is also corelated to the subject which I studied about how sounds can make a big difference in someone's life. Music Therapy is being practised in almost all cognitive related organisations and hospitals, as numerous miracles happen because of this therapy. Music is considered as the most effective healing process; this therapy is being practised since World War 1. It helps people suffering from Depression, Anxiety, Autism, and many more serious medical conditions. The composition for this project is in the key of C, dissonant sound is also composed in the similar key. There was no rule that we must use the same key, C is the first note of the piano. The sound of C is very known among non-musicians as well, as this project

is about meditation and ambient vibe. With the dissonant sound, I transposed the frequency of the notes I played, as it should sound dissonant as well which means bit different from the composition. This sound should trigger the attention of the audience, that is how it is meant to be. I composed 3-5 dissonant samples but chose two out of them. It should sound bit agitating as well because this sound will be textured with touch sensor, which means it should create an awareness sound, so that people will stop touching the plants and leave them alone. This project also provoked me to understand the behaviour of sound with other living or non-living materials like plants in this case, obviously the results will be different if we change the whole scenario.

## **Conclusion:**

The implementation of the ideas and discussions over group chats helped us accomplish what we aimed for. After practising a demo with all the equipment required, it helped a lot to understand the detail of the installation. After planning things according to everyone's availability, it was quite a challenge as there are other modules to focus on as well, but with all due respect, this group project has been one of the best I have ever worked for. Everyone is dedicated, provide creative space, take/give opinions, and no conflicts regarding anything. After completing this module, we might introduce this installation to couple of relatable industries. As I personally see the potential in the idea and especially after finishing the project, it is remarkably up to the expectations. Scenario will be quite different on a larger scale for fundamental reasons, more time-consuming meetings, and discussions. We are planning to begin with Music Festivals on a small scale, as the audience's opinion also matters. I personally discussed it with non-music related people, and I have received a very positive response. They always wanted to be a part of this 'Music Therapy', which also gives us the courage to take it further.

After couple of group chat discussions, we planned to debut this project outside university on 31<sup>st</sup> January 2020. There is a festival known as 'Body and Soul' in Ireland. If everything go as planned, it might be a successful time for all four of us, as we are optimistic about this project. I am also attaching the link to YouTube video, which is already been uploaded. Soon after finishing the module, we might plan to promote this project in our city as well. Good marketing might help us get into couple of renowned festivals, simultaneously we will promote it on social media, such as Facebook, YouTube and Instagram etc. which are major platforms to convey our message. It is good to see everyone's hard work and positive behaviour which helped all of us in achieving this task.

### 3 Bibliography:

Alves, B. (2012). Consonance and Dissonance in Visual Music. *Organised Sound*, 17(2), pp.114-119.

Gaser, C. and Schlaug, G. (2003). Brain Structures Differ between Musicians and Non-Musicians. *The Journal of Neuroscience*, 23(27), pp.9240-9245.

hear-it.org. (2020). *How the brain processes auditory signals - hear-it.org*. [online] Available at: <https://www.hear-it.org/How-the-brain-processes-auditory-signals> [Accessed 14 Jan. 2020].

Montgomery, S. and Mundy, N. (2012). Positive selection onNIN, a gene involved in neurogenesis, and primate brain evolution. *Genes, Brain and Behavior*, p.n/a-n/a.

Neuroscience 2nd edition. (2001). Sinauer Associates, Inc.

Parncutt, R. and Hair, G. (2018). A Psychocultural Theory of Musical Interval. *Music Perception: An Interdisciplinary Journal*, 35(4), pp.475-501.

Physiology.org. (2020). *Consonance and Dissonance of Musical Chords: Neural Correlates in Auditory Cortex of Monkeys and Humans | Journal of Neurophysiology*. [online] Available at: <https://www.physiology.org/doi/full/10.1152/jn.2001.86.6.2761> [Accessed 14 Jan. 2020].

Trulla, L., Di Stefano, N. and Giuliani, A. (2018). Computational Approach to Musical Consonance and Dissonance. *Frontiers in Psychology*, 9.

Wheeler, B. and Williams, C. (2012). Students' thoughts and feelings about music therapy practicum supervision. *Nordic Journal of Music Therapy*, 21(2), pp.111-132.

<https://www.youtube.com/watch?v=06VPWzDhyyl&feature=youtu.be&fbclid=IwAR3dk9A9VeMWwU9L5fYFyytfPI122oUhBvzt-jlF03k2K5VIAsoJJU3NRSA>