

“Ocean Pandæmonium -The Noisy Plasticscape- ”

AYAKA SAKAKIBARA #1,

INSTITUTE OF ADVANCED MEDIA ARTS AND SCIENCES, DEPARMENT OF MEDIA CREATION, JAPAN #1

1. PROGRAM NOTES

This work is a sound installation that uses plastic debris to consider the interrelationship between people and the ocean, and the history of the ocean. Today, the toxicity of plastic in the marine environment is being debated, and data shows the increase of plastic in the oceans. Although the data accurately represents the facts, it is somewhat cold attitude and we are rarely aware of our personal involvement in the data. Also, the ocean viewed from land is calm and beautiful, and there is a gap between the actual pollution in the ocean and what humans see from land. A critical situation for marine life is occurring in the ocean. We humans cannot live underwater and cannot truly understand the creatures of the sea. The project creates a virtual sea made of bottles to represent the gap between the sea as seen from the land and the sea inside, and emotionally translates the data to appeal to the human senses, looking into the situation and history of the sea through the lens of sound.



Fig. 1. “Ocean Pandæmonium -The Noisy Plasticscape-“ at 2023.

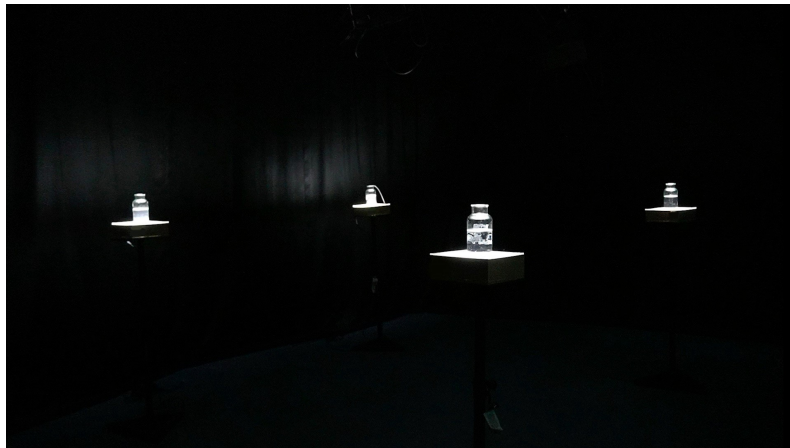


Fig. 2. “Ocean Pandæmonium -The Noisy Plasticscape-“ at 2023.

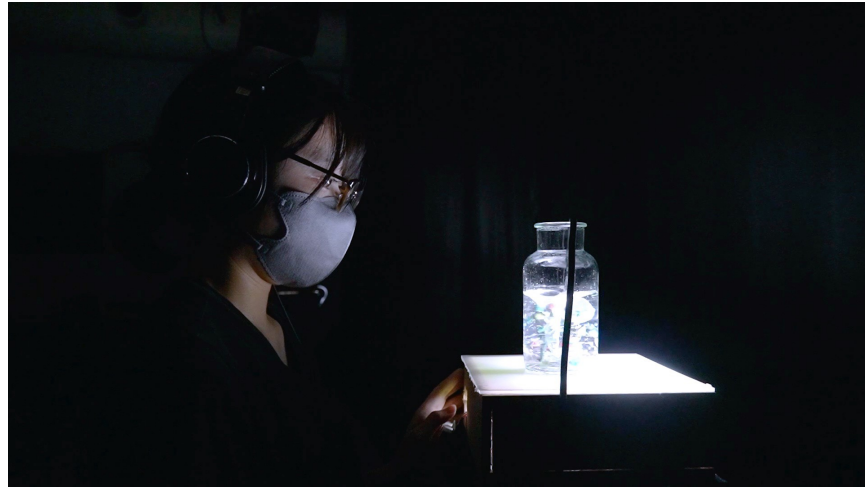


Fig. 3. "Ocean Pandæmonium -The Noisy Plasticscape-" at 2023.

2. PROJECT DESCRIPTION

The viewer's experience

- ① The viewer approaches a bottle containing water, a metaphor for the sea, in this work.
- ② When the viewer approaches the bottle, the sensor detects the viewer and the water begins to swirl. At this time, the sound of swirling water is heard, and the viewer perceives the beauty of the sound of water. This represents the beautiful aspect of the ocean.
- ③ The viewer voluntarily picks up a piece of plastic next to the bottle with his or her hand and puts it into the bottle. It is up to the viewer to decide how much plastic to put in the bottle and how many times. This action makes the viewer understand that humans are releasing plastic into the beautiful sea. In this state, the viewer still only hears the sound of the water and not the sound of the plastic pieces, representing the calm, untroubled ocean as seen from the land.
- ④ The viewer puts on headphones. These headphones are connected to a hydrophone inserted in the bottle, and the viewer hears the sound of plastic pieces moving around and bumping into each other due to the vortex, which was not audible earlier. After a dozen seconds, a creature's voice is heard. The creature's voice becomes distorted over time. The distortion of the voice is caused by the mapping of data on the increase of plastic debris in the ocean since the 1950s onto the audio effect. The sound of plastic in the water and the process of distortion of the creature's voice represent the symbolic history of our human pollution of the ocean. This work represents plastic data as a macro element and plastic fragments as a micro element.

Both of these elements exist in the ocean, and they interact with each other.

Marine Plastic Debris Collection

The plastic debris used in the work was collected from the ocean in Odaiba, Tokyo. The reason for choosing Odaiba, Tokyo, is because of the pollution of the ocean. Odaiba's ocean has been hit by serious water pollution due to sewage effluent. Odaiba Kaihin Park is not allowed as a beach because it does not meet the water quality standards of the Tokyo Metropolitan Government's ordinance. Against this background, we selected the waters of Odaiba as a representative example of ocean pollution and determined that marine plastic debris was easy to collect. The plastic was then disinfected and otherwise treated so that viewers would not have any resistance to touching it. Other than disinfection, no other processing was done. We decided that it would be desirable to use plastic waste in a state similar to that in which it was collected from the sea. We thought that seeing, touching, and hearing the sound of actual plastic debris would help people recall the reality of the sea.



Fig. 1 Plastic Debris

System

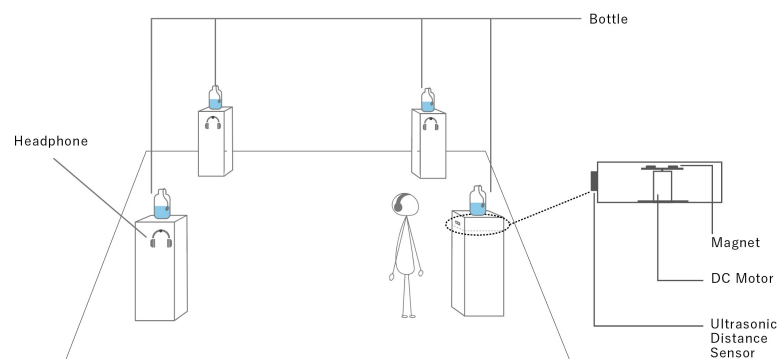


Fig. 1. System Overview

When a viewer approaches within 50 cm of a distance sensor installed near the bottle, a DC motor installed just below the bottle begins to rotate. The DC motor has a round mechanism made by a 3D printer attached to it, to which neodymium magnets are glued. The bottle also contains a rotor made of magnets. When the neodymium magnet attached to the DC motor rotates at high speed, the rotor inside the bottle rotates accordingly. This high-speed rotation of the magnets creates a vortex in the water. Arduino was used to control the vortex. When the vortex begins to spin, the sound of the creature begins to be heard.

Voices of Creatures

In this work, the viewer hears the sound of plastic debris as well as the voices of creatures prepared in advance. 4 variations of the creatures' voices are prepared: sea birds, whales, seals, dolphins, and dolphins. One of the reasons for choosing these four species is that they are vocal species. Among sea creatures, there are only a few that emit voices. The second reason is that these four species are affected by plastic debris. these four species are affected by plastic waste, mainly because they eat it, and as for seals, they have been known to get tangled up in plastic fishing gear out of curiosity, causing accidents.

Sound Design

In this work, after listening to the sound of swirling water, the viewer puts on headphones and listens to a piece of plastic, the creature's voice, and the process of distortion of the sound. The audio effects Vinyl Distortion, Noise Space, and the instruments 1950s and Ring Sing were used as noise components to create the impression of sound distortion. Vinyl Distortion emulates the distortion (distortion of sound) that occurs when playing analog records. Noise Space is another effect that generates noise, but with a smaller grain than Vinyl Distortion, adding depth to the overall noise. The 1950s is a distorted version of the sound made by pressing buttons on a telephone, and the sound itself has a rhythm to it. The use of this instrumentation created a sense of artifice. These effects and instruments were gradually applied based on data on changes in the amount of plastic debris in the ocean from the 1950s to the present.

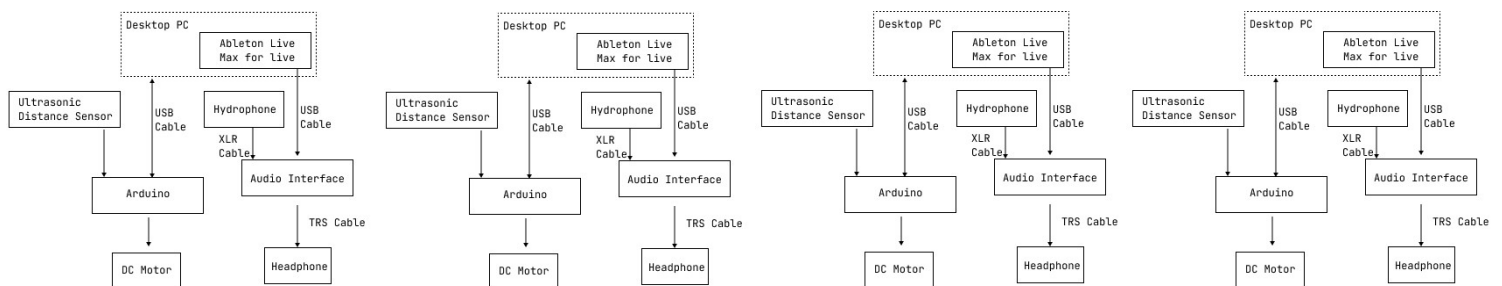
Data

The data used in the work was the increase in plastic debris from the 1950s to the present. There is a history of the gradual increase of plastic debris in the ocean since the 1950s, and through sound we can recognize the beginning of marine debris to the present. These data gradually distort the creatures' voices as the work progresses.

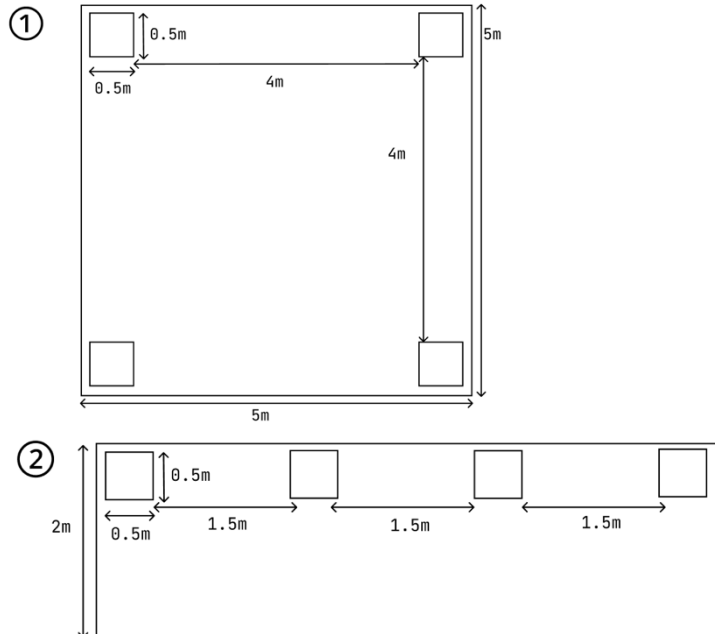
3. PERFORMANCE NOTES

Technical equipment Provided by artist	• PCs × 4 • Headphones × 4 • Audio Interfaces × 4 • Cables × 4 • Ultrasonic Distance Sensors × 4 • Hydrophones × 4 • DC Motors × 4 • Lights(Battery-operated) × 4 • Bottles × 4 • Pieces of plastics
Equipment requirements	• Approx. 400W
Volume level	• 60db
Performance time	• Permanent exhibition
Space requirements	• Minimum 5m² • A dark space
Set-up time	• 1day

This work has been installed and exhibited at university and at the Loftwork End Year Party held at Fabcafe Tokyo, thus demonstrating its feasibility. The work requires a dark indoor exhibition space, but a dark room is not an absolute requirement. Also, this work does not require Wi-Fi.



Regarding the layout, there are two proposed layout diagrams, and both can be accommodated.



4. MEDIA LINK(S)

- Video: <https://www.youtube.com/watch?v=KLEhXtMFkgU>

ETHICAL STANDARDS

All sounds used in this work were recorded and created by me. The source of any data used in the work is clearly indicated. I respect and strictly adhere to copyright rules in all my creative and scholarly work. The system uses the open source software ARDUINO IDE and consists of the minimum number of necessary components.

This work is intended to address environmental issues.

REFERENCES

- [1] Clare Ostle, Richard C. Thompson, Derek Broughton, Lance Gregory, Marianne Wootton & David G. Johns : The rise in ocean plastics evidenced from a 60-year time series,in Nature Communications volume 10, Article number: 1622 (2019)
- [2]