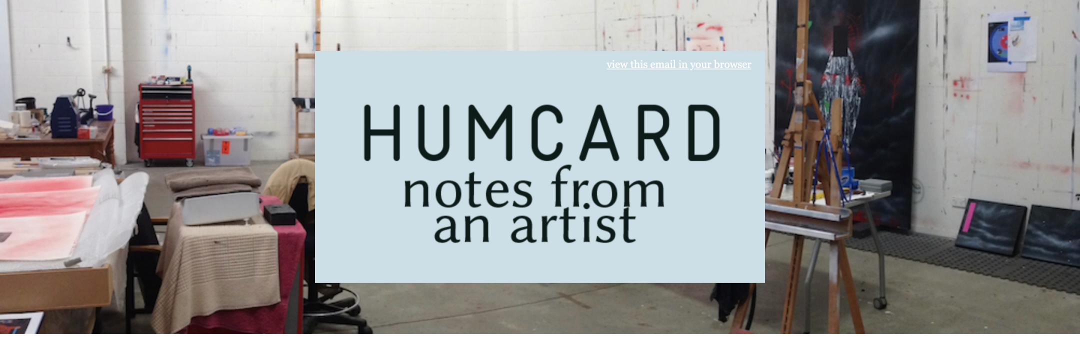

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HUMCARD

notes from an artist

Welcome to our third HUMcard for 2021. *As a supporter of HUM, we're delighted to be sending you these exclusive mailouts every couple of months, highlighting international projects by artists from Aotearoa New Zealand.*

In our last edition of HUMcard, we featured Wellington-based video artist Christopher Ulutupu and his recent exhibition ATTENTION TOURIST *at Cement Fondu in Sydney.*

For this edition, we've invited Porto-based multimedia artist ***Yota Ayaan*** *to participate. Sitting at the crossroads of art, philosophy, and science, Yota Ayaan's work and research delves into ecology, architecture, and emerging human and non-human capabilities. His most recent research in the field of natural intelligence and the acoustic emissions of plants, has lead to the exhibition* **Plant Data**, *on* ***at the Galeria da Biodiversidade, Museu de História Natural in Porto, Portugal,*** *from 12 - 30 June 2021.*

Wholly for our HUMcard readers, Yota Ayaan shares some of his process and notes for this new project below. Scroll down to learn more about Plant Data, *and about the artist's experience of working with data as a medium.*

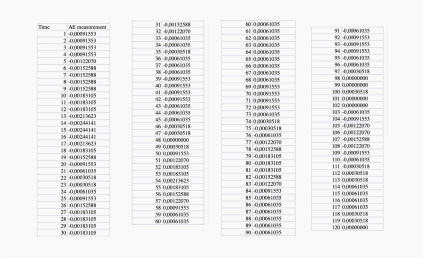
Research notes on *Plant Data*

by Yota Ayaan

Listen to the Trees

Picture of a vibration detector
used by Milburn and Johnson
[Planta 1966] to detect plant sounds

In June last year I went to the Faculty of Sciences at the Universidade do Porto and asked if they might be interested to collaborate in a body of experimental research on the AEs of plants. I suggested I would like to build a sound work with the findings. About a week later I began an artist-in-residence programme working with Mariana Sottomayor PhD, a Professor of Cell Biology developing research in leaf cell physiology of a medicinal plant. In our months of work, we studied the field of plant AEs and found that there are no recordings of plant sounds audible for humans, only records of ultrasound frequencies represented by numerical data. To make sound audible for human hearing, this data must ultimately be interpreted.



Time	AE measurement
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2	-0,00091553
3	-0,00091553
4	-0,00091553
5	-0,00122070
6	-0,00152588
7	-0,00152588
8	-0,00152588
9	-0,00152588
10	-0,00183105
11	-0,00183105
12	-0,00183105
13	-0,00213623
14	-0,00244141
15	-0,00244141
16	-0,00244141
17	-0,00213623
18	-0,00183105
19	-0,00152588
20	-0,00091553
21	-0,00061035
22	-0,00030518
23	-0,00030518
24	-0,00061035
25	-0,00091553
26	-0,00152588
27	-0,00183105
28	-0,00183105
29	-0,00183105
30	-0,00183105
31	-0,00152588
32	-0,00122070
33	-0,00061035
34	-0,00061035
35	-0,00030518
36	-0,00061035
37	-0,00061035
38	-0,00061035
39	-0,00091553
40	-0,00091553
41	-0,00091553
42	-0,00091553
43	-0,00061035
44	-0,00061035
45	-0,00061035
46	-0,00030518
47	-0,00030518
48	0,00000000
49	0,00030518
50	0,00091553
51	0,00122070
52	0,00183105
53	0,00183105
54	0,00213623
55	0,00183105
56	0,00152588
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72	0,00091553
73	0,00061035
74	0,00030518
75	-0,00030518
76	-0,00061035
77	-0,00122070
78	-0,00152588
79	-0,00183105
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83	-0,00122070
84	-0,00091553
85	-0,00061035
86	-0,00061035
87	-0,00061035
88	-0,00061035
89	-0,00061035
90	-0,00061035
91	-0,00061035
92	-0,00091553
93	-0,00091553
94	-0,00091553
95	-0,00061035
96	-0,00061035
97	-0,00030518
98	0,00000000
99	0,00000000
100	0,00030518
101	0,00000000
102	0,00000000
103	-0,00061035
104	-0,00091553
105	-0,00122070
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108	-0,00122070
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110	-0,00061035
111	-0,00030518
112	0,00030518
113	0,00030518
114	0,00061035
115	0,00061035
116	0,00061035
117	0,00061035
118	0,00030518
119	0,00030518
120	0,00000000

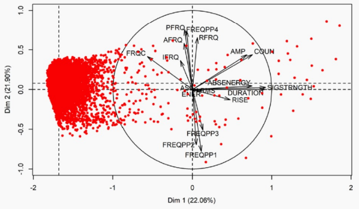
AE Data records from the Laboratory of Plant Ecology, Ghent University

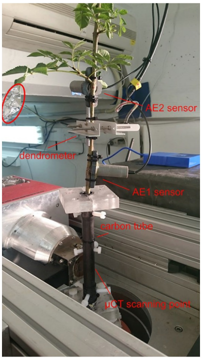
The pioneers of artistic 'interpretation' used biosensing (harvested bioelectric information) with work such as *The Secret Life of Plants* (1976), or *SLOP,* a video performance and four-way collaboration between artists John Lifton, Jim Wiseman, Tom Zahuranec and Richard Lowenberg. Since then, many other artists and interpreters have contributed to the dialogue for popularising plant consciousness.

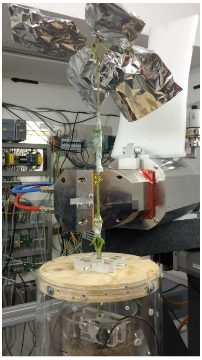
Tom Zahuranec making adjustments on the Tcherepnin audio synthesizer, interfaced with the plants and the video, to create 'music'. Performance held at Tropical Conservatory, Golden Gate Park, San Francisco, 1976. Image: Richard Lowenberg.

> *The use of acoustic emissions (AE) in plant physiological research dates back to the year 1966, when it was discovered that petioles of leaves under drought stress emit audible vibrations. The vibrations were recorded by audio sound transducers. The past couple of years have resulted in rapid developments in microelectronics leading to new advancements in the AE technique applied to plants. High performance acquisition systems are now available that can record and store waveforms from multiple channels at high sample frequencies.*
>
> — Adapted from "*From hydraulics to acoustics in drought-induced cavitation in plants*" by Niels Baerdemaeker, PhD thesis supervised by Kathy Steppe, University of Ghent, 2018.

Earlier this year we started a conversation with Prof. Kathy Steppe from the Laboratory of Plant Ecology at Ghent University. They are currently one of the top labs in detection of AEs in plants. In our conversations with her and colleagues they suggested that "actually the role of the artist here is necessary, we must attempt to convert this AE data, to interpret it in order to render it accessible". The lab sent us many data records taken from *Fraxinus excelsior* or the ash tree. The data structures are complex and convert to something not at all like *human music.*

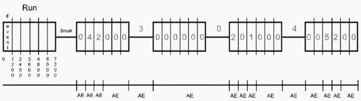


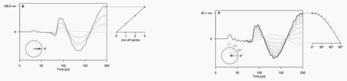




Top image (#1): *AE Data records from the Laboratory of Plant Ecology, Ghent University.* ***Bottom images (#2&3):*** *AE Sensors with Ash Tree at Laboratory of Plant Ecology, Ghent University.*

There are layers of the sound of plants concerned with three principle forces: light, air and water. The first layer of sound comes from the body growth and movement toward sunlight. Plants eat light. The second and third layers are hundreds of sound "events" occurring as specific plant cells fill and empty with air and water. Scientifically you would say it's the flow of water and the formation of air bubbles in xylem vessels. Between hydration to dehydration and back again. Just like humans and most non-human beings, charging and recharging.





Both images: *AE Data records from the Laboratory of Plant Ecology, Ghent University.*

So, for me the term 'Plant Data' is more clean than 'Plant Music'. It's more accurate and respects the plants. Plants are mysterious and we still have a lot to learn and unlearn about them. Time is also a mysterious component, especially to convert from one being to another. Plants live much slower than us, or so we assume, so a three minute 'song' does not apply.

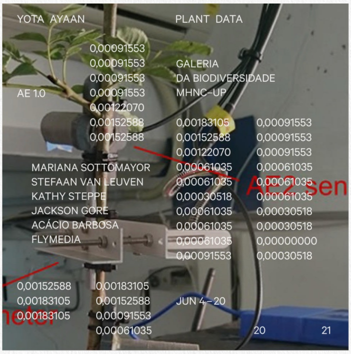
For the past two months I have worked in collaboration with Stefaan Van Leuven (Soulwax) on the interpretation of the AE data with the consideration of time conversion, and the result is a twenty-four hour work with multiple channels and three layers of speakers. The work had to be in a slower dimension, aligned with the sun but also wild and radiant like the data.

More on the artist

Yota Ayaan is from New Zealand and based in Porto, Portugal. He studied architecture at Victoria University in Wellington and sculpture at Faculdade de Belas Artes da Universidade in Porto. His practice draws upon various mediums including research, writing, installation, sound, video, sculpture and drawing.

Yota is currently completing a one-year artist in residence in research on the subject of plant intelligence and acoustic emissions working with professor of plant biology and researcher Mariana Sottomayor Ph.D. at the Faculty of Science, Dept. of Biology in Porto. This residency has led to this upcoming exhibition *Plant Data* at the Galeria da Biodiversidade, Porto in June 2021.

Learn more about the artist here...



Once again, we hope you've enjoyed this edition of HUMcard. *In a couple of months, we will be sending out our next exclusive look at an international project by an artist, curator, or arts practitioner from Aotearoa.*

Until then, we want to give a big thanks to all of you who continue to support HUM. We think what HUM does, sharing art and creativity within communities, is essential - now more than ever - and we wouldn't be able to keep doing what we do without your generosity and encouragement. So, ***thank you*** *and ka kite anō!*

Contemporary HUM is the first centralised platform dedicated to documenting New Zealand art projects abroad. We publish conversations, reviews and essays on the international projects of New Zealand creative practitioners, in addition to a calendar of events and exhibitions.