

**Investigation into moving sound and meaning in space, by Margriet Kicks-Ass.  
Sponsored by Stimuleringsfonds Creatieve Industrie. Credits: Dr. Iain McGregor.**

It has been a very informative project. I am grateful to have been given the opportunity to experiment extensively with the ingredients of sound, language, narrative and spatial experience.

The beginning of the project was a cold dive into all sorts of things I had never worked with before. New software, with which I had to make quite complicated connections: like communication with the sound card, routing multiple tracks with automation to the separate 8 tracks, and finally routing each track to each its own speaker, with a number of effects along the way in order to enhance proximity or distance. All things that are not literally described in the tutorials, because this is not the average usage. So a lot of time went into trying to understand, trying out and experimentally becoming wise, until finally I was able to control everything to my preferences.

Dr. Iain Mc Gregor helped me a lot during this period, although he himself works with other software, so I had to figure out the details myself. Which, by the way, I managed to do. It's more a matter of understanding the specific logic, how certain software is set up. We also paid attention to psycho-acoustics. How does the positioning of a sound contribute to its importance? How do you make something loaded, or rather unimportant? Frontal or above you, gives more weight than low or to the side. Movement attracts attention, as does approaching, or increasing in height. In short: trying to trigger the imagination, focusing on the listener. Focus-puller. However, my approach was precisely away from drama. I wanted certain characters to question reality in a philosophical, rather than in a dramatic or an emotional way. In that sense, my approach is innovative. (I intentionally skipped the common traditional drama rules.) Since I don't like the approach of determining the importance of a sound, I prefer instead to focus on variation and speed of movement.

Then, at Iain's suggestion, I wrote a spatialization script for a 15-minute conversation with 11 players, which I had already worked out with AI voices. The setting was a rehearsal of a choir not singing, but collectively reading a poem. This took me a lot of time. I wrote this process out twice, for each separate voice as well for the background sound. Later I discovered that I prefer to do all that in one, live. Meaning, to determine both the position and movement of the voices, as well as at the same time the position and movement of the background sound, while hearing it live. In this way I can test the result immediately, then fix it in the same moment in the software and write it down as well, for later reference.

By the way, while working out the script, I didn't stick too much to the script itself. I tried out many movements, and discovered that in particular circular movements plus skipping from front to back, or left to right or top to bottom worked best with multiple speakers at the same time. I also discovered that for proximity and distance, it works better to always add or subtract a speaker, rather than working with too much reverb. I experimented with certain routes of sound in terms of impact. I decided to elaborate on that at a later time, with other programming software.

Furthermore I researched online about audio editing with voices in combination with background noise, where the frequency range of the voice is filtered away from the background with a so-called notch filter; so that the frequencies do not compete with each other but on the contrary create space for the voices. I later applied this to the stereo edition, namely by using a plot spectrum analysis to determine the main frequency of the voice fragment, and then removing it from the background sound.

If the background sound still demanded too much attention, I determined the main frequency of the background sound itself, with a plot spectrum analysis and repeated the procedure, although the remaining sound then usually became quite hollow. In the 8-track composition however, it worked best to use the remaining speakers for the background sound, in other words, not the speakers already in use for the voice. My working method is usually just following the work, rather than putting an overpowering script on it.

It was a very labor-intensive process to determine the volumes per speaker for each voice, and then again for the background noise. I drew this all in manually on all the individual tracks (12 of them) in the audio software. For the background sound of the first episode, I used recordings from my sound sculpture the Splashbox, which created an interesting contrast. Since they involved live recordings of a concert, they automatically already contained their own spaciousness, unlike, say, studio recordings, which can sound a bit unnatural or flat. I was satisfied with the result and received good feedback. I also learned how to export the files so that they can be played in a professional 8-speaker setting.

The second piece I decided to make in English. My starting-point was a script I had already written, which I then ran through the online translation machine and worked it out with text-to-speech software, narrated with English slang from around the world. As background sound I used recordings of live concerts with my instrument the Rauschmaschine (noise-quaker). The piece was interrupted throughout by short poems, from my self-published book, Cracked Cement, which is a poetical research about death. It turned out that taken out of context, these poems fell totally wrong, while within the context of the book they caused no issues at all.

Furthermore, I had recorded the 8-track version as a 360-degree spatial composition, with a handheld recorder. It turned out that this comes at the expense of speech comprehensibility. The perception of an 8-speaker composition is difficult to record clearly. The sounds lose clarity and are more difficult to distinguish from each other. Although I myself was satisfied with the text in relation to the background sound, this piece fell off with certain listeners, because of misinterpreted text. While the script itself, as a printed text was previously received enthusiastically; there was even willingness to publish it at the drama library's data base. Furthermore, I did get good feedback about the background sound itself. It was unfortunately a bummer that the whole spatialization aspect seemed to be dwarfed by the misinterpreted text. I took this episode offline, although it had been listened to over 200 times.

Iain had advised me to make the voices more human, closer, by, for example, coughing, mouth sounds, sighing, etc. I didn't like that idea so much. But I concluded that AI is AI, and I didn't want to make that more deceptive. I opted for the other side, instead I to delve further into programming the movements. After all, I had figured out what worked and what didn't, and if I could program the background sounds, I could later draw the voices in manually, I decided.

I had noticed that too much movement in the voices sounds implausible. It became too much of an effect anyway, (especially with too much reverb added), where I started to wonder more and more why which voice sounded where, while I was drawing in the tent-shapes in the sound tracks (to determine the individual volumes). Whereas letting the background noises flying around does work well though, it requires your attention to follow the movements and gives a sort of sense of the universe, the space you are in seems to expand.

I decided to focus on programming software (Pure Data) that would allow me to program the movements of the sound into a patch, instead of drawing it in manually. In addition I could speed up the movements through space considerably. Besides the fact that this saves a lot of time, I also found it a fun challenge. In addition to the patches to control movement through space, I also programmed modules to generate new sounds with, including frequency modulation and granular synthesis. In addition, I experimented with different filters. After all, my collection of concert recordings would run out at some point anyway, and I enjoyed being able to create new compositions again. I let Iain know to go my own way and started programming in Pure Data with the Else external.

Furthermore I started writing a new text script. An investigation into AI, as I announced in my application, in which I wanted to find answers to questions such as: When is AI still credible and when does it fall through? How ridiculous can something sound, while still being serious? Is it taboo to have a computer voice recite poetry? What does a computer voice not understand? Can a computer voice make a fool of itself, or be humorous?

That's where I got stuck. An interview format in which AI is questioned regarding its qualities relative to humans is difficult to make engaging. Besides, all the voices were artificial, so who was supposed to interview whom? So I tried to have each character answer the question: How predictable are you? With a reflection on predictability, and to what extent you can outdo your Avatar. While there were some funny moments in it, I personally didn't think it was good enough. Not what I expected from it. So after discarding yet another version, I decided to rewrite a previously written script, and introduce AI into it, where I could clarify the premise through the characters' reactions, rather than through a literal questioning. So I applied the writing rule: Show, don't tell.

The script is about Paradise, which I expanded on to what extent there would be room for AI in Paradise. It was a golden touch, suddenly everything fell into place. In addition, I used the Text-to-speech software extensively, by having voices from all over the world reading Dutch poems (no longer about death, however, but other poems), which worked hilariously. Moreover, I had two characters, who already admitted to being artificial, argue in a human way. In this way, I suddenly felt the appropriate tone of the piece and could effortlessly put all my research questions into it. I experimented extensively with abstract sound versus meaning, thereby exploiting the quality of AI, rather than its weakness (that it sounds cold).

However, the moment you start talking about paradise, you can't escape the divine, which of course, as expected, turned a lot of people off. But I received plenty of enthusiastic reactions as well, from people who didn't fall over the text and who could also appreciate the combination with the chosen sounds. Although maybe the ending got a little too preachy, so I decided to delete that for the 8-track version. In addition I built up a new collection of sounds, in the form of short compositions of about 2 to 5 minutes each, which I made with PD and combined together into a multi-layered composition, in which there are in the background-layers always new sounds to discover. As new experiment I made the voices blend more into the background sounds, rather than use them as contrast.

It has become a profound examination of AI and poetry, which I think is an original angle. Online I have published a spatial 2-track edition of this radio play, and soon I will publish the 8-track version on Bandcamp. In short: I enjoyed working on it a lot and am satisfied with the result.

## Conclusions regarding my starting points

I succeeded in creating an unexpected sound experience. The radio play variant I experimented with is original, although its credibility depends on the credibility of the voices. It was often difficult to apply the right emphasis, which directly detracted from the character. I did manage to make the game hilarious and absurdist, mainly by having artificial voices from around the world recite Dutch poems, either forward or backward, so that the meaning half shone through, some more clearly than others. This worked well, in my opinion. Furthermore, there are no unpronounceable sounds for text-to-speech computer-voices; everything can be pronounced, more or less hilariously. Whereas bringing about confusion to the listener was a bit trickier; it was clear that I worked with artificial voices, therefore it worked better to overdo this, than by trying to deny it.

Moreover I experimented extensively with contrasting background noises as well as camouflaged background noises. With contrasting background sounds, it takes the listener more energy to follow both. With that, less attention is paid to the text. On the contrary, if the voice is more woven into the background, the listener is more carried along, but listens much more critically to the text.

In addition, I experimented a lot with competition by frequency range, filtering out overlapping frequencies. This proved to be especially important in the stereo editions. In the spatial 8-track setup, the human ear itself can focus on that which attracts attention, and in principle almost nothing needs to be filtered out in the remaining channels.