Speaking in loops that change - writing for the wandering listener in *Time, diffracted*

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Abstract

Time, diffracted is a confessional, autofictious speculation on notions of time. While the starting point may be personal experience, my original writing is transfigured and transformed by a process of performative writing in which improvisation and the switching of order, of meanings, of subjectivities and components of the writing lead to new insights on the seeds of possibilities contained within my original text. Voice recordings are complemented and juxtaposed with the meanings inherent in soundscape recordings and small musical loops. The work is a navigable 3D non-linear audio experience in which listeners choose what they want to listen to. There is no narrative arc, and the work is open to multiple interpretations. This artist talk will share the creative process behind *Time, diffracted.*

Keywords

soundscape, performative writing, audio labyrinth, aurature, webXR

Introduction

Time, diffracted is a 3D audio labyrinth navigated by listening. The wandering listener can navigate the labyrinth in whatever way they choose. By placing themselves between different audio sources, listeners can choose what combination of sounds or voice recordings they want to listen to. Narrative voice recordings are expanded upon and juxtaposed with soundscape recordings or small musical pieces. The purpose of the work is to speculate on notions and perceptions of time.

As in much of my artistic work, my starting point has been a confessional and autofictious form of writing that begins from personal experience [1]. In *Time, diffracted,* I use the personal as a starting point for speculating on notions of time. However, what is particular in this work is that in translating my writing for the navigable audio environment, I use a performative approach to writing in which I make a long voice recording based on the original written text. As I read out loud and improvise on the basis of my original text, I switch the order of the sentences, switch the subjectivities (I becomes You and so on), switch subject and object, exchange elements of my original text in a performative, improvised process that brings to surface new meanings and possibilities in my original text.

In this artist talk and creative practitioner reflection [2], I first situate and contextualise *Time, diffracted*. I then describe my process and share some of the insights that emerged as I sought to write for the wandering listener. I also address how the theme of the work emerged through an interplay between plundering my own audio archives and through thinking about time in everyday, confessional ways. I share my artistic approach to writing in loops that change. Finally, I will reflect on WebXR as a platform from the perspective of technological accessibility.

Writing for the wandering listener

Time, diffracted is born out of a desire to experiment artistically with writing for listeners in a non-linear and somewhat interactive form. Over the last decade, my artistic practice has tended towards the use of voice and listening in works such as *Give me a reason*, from 2016 [3], *Transplanted* in 2022 [4], *Gray hairs*, published in 2023 [5] and *zzz* published in early 2024 [6]. However, none of these works are navigable by listening *only* - each is built upon the expectation that readers have some degree of vision. This means that although each can be experienced through sound alone, some essential meanings are lost when visual elements are not part of the reading or listening experience.

For *Time, diffracted,* my starting point was to create a fully aural experience which would be no less without visual elements. My purpose was to focus the experience on the act of listening in order to attune and focus the listener on their sense of hearing. John Cayley describes this type of creative practice as aurature, arguing that the ongoing technological changes in our media environments are making it ever more possible to turn towards literary practices anchored in an experience of listening as a form of reading [7]. Beyond it's aural aspects, *Time, diffracted* can also be contextualised in practices of hypertextual writing. As N. Katherine Hayles writes: "multicursal labyrinths… have branching points so that the maze treader has to choose whether to turn right or left" [8]. Although Hayles is using the labyrinth as a metaphor for hypertextual writing, in the case of *Time, diffracted*, we can employ a rather literal reading of Hayles' observation. In this work, listeners select which sound source is most appealing to them, and move their avatars towards this as a form of choosing their path of reading through the three dimensional labyrinth.

A recent example of a work which tends towards this notion aurature and which I have found inspiring and relevant as a way of contextualising my own practice and approach in *Time, diffracted* is a digital game called ECHOES [9]. Although the game includes a wealth of visual elements, the artistic starting point for creating the game was to think through sound and listening. The game cannot be navigated by listening only because some game mechanical aspects require clicking on visual elements, however, players make choices about which direction to move in based on following either soundscape recordings or voice recordings. Moreover, *the act of listening* as a form of interaction is conceptually important for the theme of ECHOES because the game's purpose is to highlight the importance of listening, observation and the taking in of vivid impressions instead of delivering judgments, interpretations and conclusions.

While I had mulled over the idea of creating work primarily navigable by listening, I was constrained by the limitations of 2D HTML-based environments which is the medium I usually work with. When I came across WebXR, I quickly realised that it would be possible to create a navigable 3D environment in which I could place directional sound sources. This would mean that I could create an environment where my listeners could navigate by spatial perception of sound.

I began my artistic experiment by plundering the website sketchfab.com, looking for three dimensional maze objects with permissive copyright licences. I first settled upon a circular maze but soon noticed that navigating it felt nauseating. It was also made up of too many polygons, which meant that it was very heavy on the graphics processor of the computer, slowing down the navigation experience. After attempting to work with the high resolution circular maze, I changed approach and searched for low poly (low resolution) mazes. I found an asset called Simple Maze by user Grandsloth [10] with a CC-BY4.0 DEED licence, which ended up becoming the basis for my work.

Given how the Mozilla hubs scene editor was marketed as easy to use, I was surprised at how long it took me to learn to use it and to establish my workflow. At times it was also difficult to understand the behavior of some of the parameters and settings of the elements as there was scant documentation available. However, playing around and trying things eventually led me to gain an acceptable amount of control over the technical elements so that I could finally focus on my artistic process.

The creative process

Once my technical workflow was established, I was able to begin to add assets to the scene. I began with the 3D maze as well as a floor grid so that at first I had a 3D navigable maze that I could walk around in. I then wrote the first text which alludes to notions of time, movement, sound, listening, and closing one's eyes. Because the listener invariably spawns at this audio recording, the text was written to serve as a kind of instruction on how to navigate the environment: "close your eyes, even though you don't need to", or "you walk, or at least you pretend to walk and peek around the corner", as ways to instruct the listener in how to behave and navigate the experience.

The text also calls on the listener to "listen… to what you might hear around the corner". The text alludes to the theme of the work in ambiguous ways, for instance: time "hardly travels around the corner" or time: "it already started, what does it matter?" and so on. Below is the original text:

> You close your eyes, even though you don't need to. You walk, or at least you pretend to walk and peek around the corner. Listen, I mean to what you might hear around the corner. Time, yes, it already started, what does it matter? It comes around again, around the corner and you hear it again. I hear it again, just around the corner. Sounds like something else and I have to move, to hear it, to listen to it, because time hardly travels around the corner. Diffracted, it propagates around obstacles, much like sound. Imaginary obstacles in time, diffracted as it moves around obstacles. Memories, a dead end, and I pause to listen and I try to remember. Then I close my eyes.

To complement these voice recordings, I initially sifted through the website freesound.org, searching for suitable audio files that had a permissive CC licence. However, as I listened to random audio recordings on the site, I recalled that I have a vast archive of soundscape and other types of audio recordings from a period of around 2014 - 2016 during which I actively listened to my environment, capturing sounds that I felt were of interest. I began plundering my own audio archives, sifting through folders to preselect sounds and recordings that felt interesting to me.

To begin to compile the world for the listener, I selected a soundscape recording with footsteps, church bells and street ambience. I placed this recording such that it was audible once the listener moved around a corner in the maze. I tweaked the parameters for the direction of the sound sources such that the sound would travel in a way that there was overlap once the listener traversed the corner. I was extremely satisfied with this first experiment, because by moving my avatar in the space, I was able to create a mix of the two sound sources in which I could listen to either one or a mix of the two. I found the interplay between the text I had written and the various sounds in my soundscape recording intriguing. Multiple meanings intersected and gave new meanings to both the text and the ambient sounds.

Fresh perspectives on time past

Following this initial validation of my artistic idea, I immersed myself in the soundscape and musical recordings that I had collected and created roughly ten years ago. Listening to these materials became a form of time travel as I remembered past moments and life phases. I realised, through exposure to these artefacts from my personal archive, how distorted my memories of my recent past were. I was also positively surprised by how interesting and beautiful some of my own past audio work was. This made me realise that I had perhaps not given myself as much credit at the time as I may have deserved: self-image can be fickle and is easily distorted. These observations seeped into my writing process, which became more and more a dialogue with the materials in my audio archive and the thoughts that they inspired.

Besides the impulses that my audio archive gave to the writing, the artistic process also heightened my awareness of thinking about time, in general. For this reason, my attention was easily captured by any detail in my daily experiences which alerted to notions, perceptions and conceptions of time. For example, during the process of working on *Time, diffracted*, my child asked me when does a day end and a new one begin. In trying to answer, I realised the depth of what this simple question implied, and that there really was no easy answer to this. In another moment, I found myself walking in familiar streets when suddenly I was as though transposed into the perceptive experience of a one hundred year old stone building. I realised that the building had "seen" several generations age as they habitually walked the streets around it, going about their everyday lives, much like I was doing in that moment. The movement of rapidly aging people sped up in my mind's eye as I pretended to see what the building could see. These observations made their way into the texts that I wrote for *Time, diffracted*.

With regards to the process of thinking about time through the artistic process of writing for the audio labyrinth as well as compiling audio observations in the form of soundscape and other recordings, I realise that although the work has gained shape and size, I may not be quite done with populating it with materials. My approach of thinking through sound and through writing about time has heightened my perception of how sound connects to my foundational experiences of time. In this sense, *Time, diffracted* may still be a work in progress.

The visual aspects of the audio labyrinth

While compiling the audios in the maze, I needed to be able to see where I was placing the audio, and for this reason I worked on a version of the maze where the corridors and paths are visible (see figure 1). When I share the work in progress, I often shared it like this. However, the visual cues naturally lead to navigating the environment based on vision, at the detriment of audition. During the process of creating the work, I experimented with tweaking the parameters such that the environment was mostly only white, with no walls, floors or other visual cues that would suggest where the listener could go. When I tested the experi-

ence in this form, that is, where visual cues could not be relied on for navigation, I found myself much more attuned to listening. "Turning my head" in virtual space gave a good idea of the direction of the sound sources, and I could then navigate towards my preferred source. This means that the exhibited version of *Time, diffracted*, will always be shown without the visual cues, in order to allow immersion in listening.

Figure 1. Screenshot of *Time, diffracted.* This image illustrates the branching inside the maze. ©Terhi Marttila

Writing in loops that change

To tie off my reflection, I will touch upon the performative writing approach that emerged in writing for the constraints of the navigable 3D environment. This artistic practice merits it's own discussion, and will be expanded upon in future contributions. The principal challenge in writing for *Time, diffracted* was to come to grips with the lack of control over what listeners would hear as they wander about. As listeners navigate the 3D environment at their own leisure, they may happen upon a voice recording anytime after it has "started". This makes it difficult to think of writing from a linear perspective, since different listener's beginnings will occur at any possible point in the recording. My initial solution to this was to attempt to write in a loop: whatever I wrote would make sense wherever the reading started.

When I began recording the text (written as a loop of six or so sentences) I found myself making slight variations to the text as I read it through again and again. I switched an "I" to a "you" and was intrigued by how this changed the meanings in the text. I continued my performative reading in this manner and found myself not only switching the subjectivities, but also the order of the sentences, exploring the text's internal dimensions and potentials. I began using my source text as the basis for a performative form of writing that, in the moment, sought to extract new meanings from the original text. Importantly, even though I "improvised" new text as I recorded, I did not deviate from the words, concepts and gross sentence structure of the original text. This constraint for the improvisation kept the final result within certain conceptual limits and served to maintain coherence in the final result.

The most intriguing aspect of this approach to performative writing was that it led me to discover new meanings and new possibilities in my original written text as I mused over possible recombinations. As such, this approach could be used for speculative writing, that is, as a way to generate multiple perspectives and complexity on a given topic, instead of using writing as a way of simplifying and trying to explain. What could also be of interest is to contextualise and reflect upon this approach in the context of the current landscape of "AI"-driven text generation tools. In engaging with this performative approach, I couldn't help but think of the parallels between generative large language models and my own behavior as I milked my own writing in the hopes of extracting all possible meaning through exploring the recombinations. It would be intriguing to think about and to experiment with how a human intelligence -based generative approach differs from one involving a machine. This is because my performative generative approach "automatically" excluded gibberish and sought to create a coherent narrative between the multiple iterations. This could be something to explore in the context of National Novel Generation Month (NanoGenMo).

Discussion

In this section, I will comment briefly on WebXR as a platform for artistic creation from the perspective of accessibility and obsolescence. Finally, I will reflect on the work and possible future directions.

Technological accessibility and obsolescence

Athough WebXR makes for intriguing creative possibilities, it does not come without troubles. Through my experience of creating *Time, diffracted*, the two central platform-related troubles are technical accessibility and obsolescence. Although the platform and other similar platforms proclaim to make the creation of 3D worlds easy and technically accessible by comparison to comparable desktop software, it was nevertheless a struggle to familiarise oneself with the interface, workflows and parameters for different objects and elements. Moreover, the online editor for creating "scenes" is heavy on the computer processor, and as such is only technically accessible using recent computers.

Merely accessing and navigating these browser-based 3D worlds is also heavy on the processor, meaning that these worlds are not as technically accessible as one would assume based on the value propositions of the foundations and corporations that build the platforms. This became evident when the work was shared at the ELO UnConference in January of 2024. The UnConference gathered delegates from all over the globe, and it was observed that several, although not all, participants from Nigeria and India accessed the work on mobile phones and tablets, while most European and North American delegates accessed the work on desktop or laptop computers. In general, the processing power of the mobile phones and tablets was not sufficient for experiencing the work. This means that WebXR has serious accessibility issues both for creators and readers/viewers of these works.

Another concern is obsolescence. I am accustomed to creating work in nearly pure HTML5, meaning that my work is at relatively low risk of obsolescence. *Time, diffracted* was initially created for the Mozilla hubs platform, and like many of the works in the ISEA online creative works exhibition, later on *re-created* on the Styly platform due to the very sudden shutdown of Mozilla Hubs. It took an immense amount of work to compile the work on Hubs, and a nearly equal amount of work to recompile it in Styly. There is also no guarantee that Styly, a private corporation, will continue operations. Mozilla Hubs was an open source project, and as such there is a possibility that it will live beyond institutional support. Nevertheless, *Time, diffracted* and other artistic works created for and on these platforms, are at high risk of obsolescence.

Future work

While *Time, diffracted* is in some ways complete, the work calls for further iteration. The practice of observing which sounds anchor my experience of time and then writing about these key moments and experiences has began to feel like a meaningful practice which I have held onto. Meanwhile, I am not entirely satisfied with the way I have

placed the sounds in the labyrinth, and would like to explore the potential of placing the sounds such that more complex traversals of the sounds are possible. Currently, the sounds are placed in roughly two distinct directions with some minimal side branching, but I would like to place them such that circular trajectories and more complex branching is possible.

The limited scope of the maze also means that listeners may easily get lost once sounds end on either end of the two branches. Initial feedback also suggests that the experience may feel claustrophobic as there is no way to "get out" or no "end" to the experience. Moreover, I intend to "test" the work with real listeners using video-cued recall to study how my listeners experience the work. Past experience of employing video-cued recall, in particular in the context of my PhD dissertation [11] has shown that insights about user experience in interactive art can feed into the artistic process in meaningful ways.

Time, diffracted is my first artistic approach to working in three dimensional environments. As such, it is a creative exploration of where my artistic practice could go if I expanded it into the media, domains and platforms that are more traditionally of the world of computer games. I am intrigued by the technical limits that WebXR places on interactivity, which in this case has led me to think about new ways of writing for the wandering listener. However, the experience of creating *Time, diffracted* has awakened my curiosity for creating three dimensional navigable worlds where I could have more control over designing interaction.

As such, this artistic process has served to set my next professional goals, namely, to venture into the use of game engines in particular and other 3D-software as technical approaches to making my creative work. Therefore, although WebXR may not have been as beginner-friendly as I had expected, it has served as a stepping stone to begin to master more complex software for the creation of 3D worlds.

Conclusion

This artist talk expanded on the creative process of making *Time, diffracted*, a 3D audio experience navigable primarily by listening. The work employs soundscape recordings and performative writing in loops that change to reflect on perceptions of time. Although the work is complete, in some ways it feels like a work in progress. Future work involves adding further audio materials to the environment, video-cued recall to study listener experience as a way to inspire further iterations on the project, as well as a critical, theoretical discussion on the generative, performative writing approach that emerged in the process of creating the work. Importantly, this artistic process has fuelled a curiosity towards working with game engines as a way to create three dimensional environments - with interactivity.

Acknowledgements

Author Biography

Terhi Marttila (she/her) is a Finnish artist and researcher who appropriates programming, language and voice to make things that meander at their crossroads. She works predominantly in the digital realm, creating works that exist as web pages. Terhi is based in Portugal and is currently a postdoctoral researcher at the Interactive Technologies Institute (eGames lab). Her work has been published in the Electronic Literature Collection 4, Revista Saca, taper#11, The New River, nokturno.fi and raum.pt as well as at various academic conferences. For more information, see her website at https://terhimarttila.com

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