

Modeling Water Perspectivism into a Digital Experience

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Abstract

Indigenous worldviews place humans as deeply interconnected to nature. However, digital materials often limit the production of non human-centric experiences. Building on work that places perspectivism as a core tenet for artistic creation, we explore thinking from the perspective of water in the creation *Being Water*, an interactive experience representative of confluence of different digital media. This collaboration demonstrates how digital media can simulate and express the agency of non-human entities, challenging human-centric design paradigms. The project incorporates diverse artistic approaches, such as immersive video capturing by rivers and seas, poetic narratives inspired by the water cycle, and AI-generated visuals. Supporting and incorporating Large Language Models in the creative process, we reflect on the role of machines as tools for perspectivism while highlighting the limitations of current AI systems in representing other ontological perspectives.

Keywords

Perspectivism, Water, Interactive Experience, Generative AI

Introduction

Water is an essential part of life on earth, covering most of the planetary surface and also being an essential compound for all living beings accounting for about 70% of the weight of mammals. However, in modern thinking, it is most often regarded as a rather inanimate thing, serving as backdrop for life rather than a living thing by itself. For many indigenous thinkers and artists, water bodies might be more complex and alive than what we normally give them credit. Aided by these traditional ontological perspectives and following the path of artists that have thought about water as a creative process to better understand media, we propose to construct a digital experience that can recreate the worldview of a water particle. We propose a three-dimensional environment, constructed using 360° videos, recordings of authorial texts, 3D sculptures and real time Large Language Models (LLMs).

Perspectivism and Water

Although Indigenous thought is very diverse in ideas and postulates (as much as geographies and sociocultural aspects), environmental protection and nature's agency are recurrent topics among many indigenous thinkers across the globe.

This might be related to the common perception of indigenous people as environmental protectors for their sustainable relationship with natural territories. Thanks to the fight of the Maori people in New Zealand, the Whanganui River became the first ever river to be granted rights in a judicial court [7]. Many other rivers since have gained rights in countries such as Bangladesh, Colombia and Australia [9]. Many original nations and other communities are fighting for the rights of natural places and ancestral territories.

Anthropologist Eduardo Viveiros de Castro proposed a cultural syncretism of Amerindian ontology in the idea of perspectivism. The author postulates that for many indigenous peoples in the Amazonian basin and elsewhere, beings such as animals or natural objects might be perceived as something with a sense of humanity or a reflective condition of a subject [3]. In this vision, we can perceive a river or water itself as something with a perspective of its own: ideas, emotions, agency, and a specific perception of the whole world.

During a collective interview, film director Mileidy Orozco Domicó, from the Emberá Katío people in Colombia, said *"After many years of experience, I have come to several reflections. The first is [the need] to demystify that nature has no voice; I believe the notion it has no voice reflects more on humanity than on the environment. Nature, its landscapes, all its ecosystems have been speaking to us from the beginning of the universe about sustainability, about tremendous reciprocity. They are telling us of connections and relationships founded long before our personal arrival in this universe"* [5].

Following this line of thought, we could ask ourselves about the perspective of water: *What do rivers say? What does the rain think? What feelings has the sea?*

Some Ideas on Water and Media

A certain notion of water agency can be found in the works of many media artists. Martial artist, director and actor Bruce Lee's philosophy of practice is described as *"Don't get set into one form, adapt it and build your own, and let it grow, be like water. Empty your mind, be formless, shapeless — like water. Now you put water in a cup, it becomes the cup; You put water into a bottle it becomes the bottle; You put it in a teapot it becomes the teapot. Now water can flow or it can crash. Be water, my friend."* [6]. In this metaphor of water, Lee proposes martial artists to transform their bodies like water. Despite the fluidity of water being unattainable

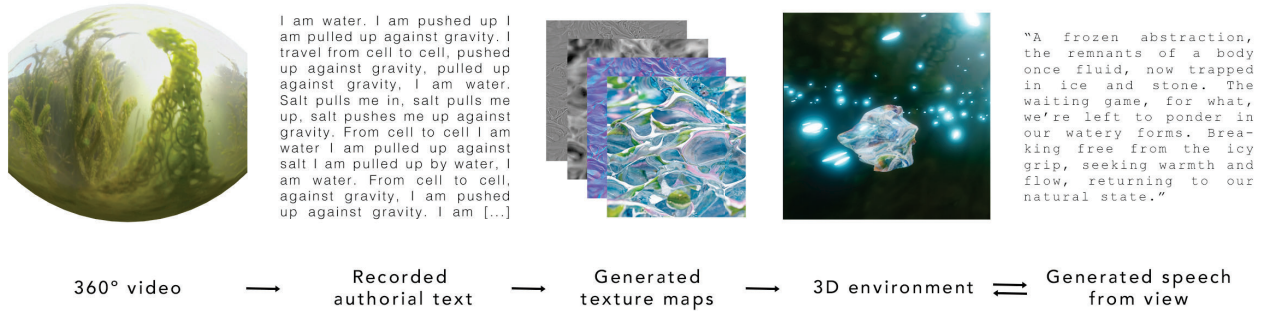


Figure 1: Water-perspective workflow for the digital experience

for a human, it is an invitation to transformation, fluidity, and resilience. The artist's body itself, partly made of water, can use the mental idea of water to become adaptable.

In an interview to the historic soviet filmmaker Andrei Tarkovsky in his early career he stated that *"As for editing, my principle is the following. The film is like a river; the editing must be infinitely spontaneous, like nature itself. [...] On the contrary [to Eisenstein principle], the nth shot seems to me to be the sum of the first, the second, the third... fifth, tenth... and of the shot "nth-1", meaning the sum of all shots preceding the nth. Thereby we create the sense of a shot, in relationship to all the shots that have preceded it. That is my editing principle."* [2] Tarkovsky presents an idea of cinema inspired by the structure of the river. There is a directorial similarity between the film rolling inside a film camera and the water flowing downstream on a river. Rather than cutting the film according to the soviet tradition, Tarkovsky gets inspired by the fluidity of the river to construct a flowing film in the search not of meaning but of flux and time.

In 1980, Italian sculptor Giuseppe Penone presented a pair of identical rocks. One of the rocks was taken from a river, and the other one was carved by himself to attain the exact form given to the rock by the river. He describes this exercise in the original catalog as *"To extract a stone sculpted by the river; to travel upstream and discover the exact point from which the stone came and extract another piece of rock from the mountain and duplicate exactly the stone taken from the river is to be the river (...). To actually carve the stone, you have to be a river."* [4] The exercise of Penone is on itself to be a river, which is the exact title of this work: *Essere Fiume* (*Being River*). Moreover, it is to transform media as if water.

In these selected examples, we see how different types of artist relate to ideas of using water as a way to think on their craft. One is to metaphorically think of water as a mental idea that permits the transformation of one's own body. The second one is to rethink media's technical principles with the fluid idea of a river. The third one is to mimic a river as an art maker and, as such, to mold as if one was the river. We expand on water perspectivism, by considering a collaborative exercise in a digital experience (see fig. 1).

Digital Perspectivism of Water

Being Water was conceived as an interactive experience in which the viewers are submerged in a body of water, where they can freely explore a three-dimensional space and listen to voices of *water beings* and the music that small droplets produce. The piece was a collaborative work among various artist that combined their different expertise into a single interactive experience. While digital media in itself was constructed with the cold ontological lens of science, we wonder if it could be forced to fit and represent an ontology closer to that of indigenous perspectivism. For this, each digital artist re-imagined their craft to attempt to craft as water would craft or try to represent the perspective of water by giving it some kind of agency.

Water is a Filmmaker Filmmaker Andrés Isaza-Giraldo used a 360° camera with a diving case in order to film underwater images of rivers and the sea shore. To attain this, he attached the camera to a nylon string hanging of a cane. While he would revise the exposure between shots, he had no feedback during the shooting itself, since no wireless connection works over mediums (water/air) due to extreme refractive conditions. He had the option to move the cane, release more string or walk following the current. Yet, he had no control over where exactly the camera was going and thus the videos were made in collaboration with the river currents. In a way, the camera operator was actually the river with human assistance. In this process, the filmmaker wonders what and how would the river or waves film, being forced to trust on the river agency while waiting outside of the water for the shot to finish. Four shots were later selected, and edited to an approximate duration of 1 minute. The shots used in the interactive experience were filmed in Portugal in the Mondego River (Coimbra), Levada da Rocha Vermelha (Madeira Island), Cruzeiro da Rana (Cascais) and Adraga Beach (Sintra). Finally, the shots portray a specific perspective, that of something that moves in the water current and that could be water itself.

The Poet is Water Inspired by the 360° videos, artist Terhi Marttila started speculating on the possibility of writing the story of water in the perspective of a single atom or a droplet.

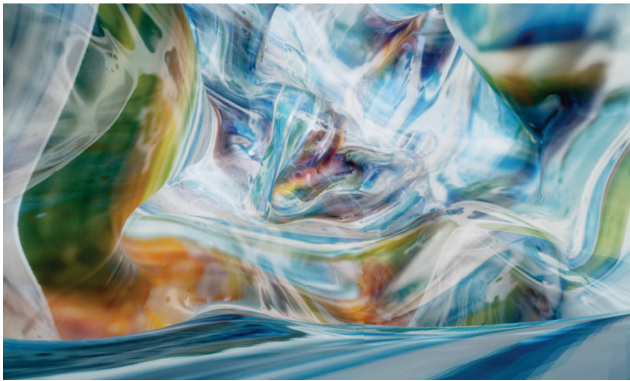


Figure 2: Inside of a *water being*.

The artist started describing the well-known cycles of water in which water evaporates, goes up, condenses, goes down, falls on the soil, runs through the river and ends up dispersed in the sea, to maybe start once again. Then, the artist started recording those poems with their own voice, doing subtle iterations each time, trying to imagine the very small things that can happen to water in transit between the flowing rivers, the sea, the underground and any other bodies of water. For each repetition, the poem was renewed, the perspective became stronger and it became more evident at each moment that the journey of the water particles is a long and intense one, far more complex and lively than we could otherwise imagine. This voice, the simplest anecdotal voice of water gives it a more complex dimension, one in which history and agency is gained. Many questions mediate this exercise of writing and improvisation: *How does water understand the world? Who might water want to talk to? And what does it have to say?*

Generative Water Sculptures Artist Rafaela Nunes used fragments of the text generated in the previous step as prompts that were input into a Stable Diffusion model in which they were combined with the artist's paintings to produce new images that mix the stories of water with their own authorial images. The model created new images that served as texture maps, that were later procedurally transformed into 3D shapes inside of the Unity game engine, in correspondence with the image characteristics. The artificial beings that resulted from the process—*water beings*—became unique creatures with water-like visual characteristics. While the semi-arbitrary form created by the algorithm network could resemble the sculpted rocks of Penone or those made by a river, it was deemed the most interesting by the artist to see the interpretation that the digital model might have of what being water is and how the model would represent that. Some ideas about the perspectivism capacities of a machine began arising, despite the obvious limitations from the non-perspectivism nature of the datasets as most of modern art and design is often centered in a human perspective of the world.

Confluence into a Water Universe Afterwards, all the elements were combined in a virtual environment, as the artist Paulo Bala organized them in a three-dimensional space in

the Unity game engine. The different elements of water perspectivism came together like bodies of water that converge. The 360° water videos are set as a background sphere, the *water-beings* are allocated to randomly move in the space and given the poem recordings with spatialized sound. An additional being is located in the center of the sphere to function as a button to change the background video. The artist can see how these things constitute a universe and organize them accordingly, making a lighting path across the water. Now, this digital underwater landscape starts to look like the solar system or even a galaxy. We arrive to a complex perspective for water: the place that water inhabits is for water its own universe, water is in itself the universe of water. That is, that water is constituted by water and inhabited by water.

Calculations of Water Perspectives While this water-centric universe was constructed with the use of digital media such as digital cameras, digital recordings, diffusion models and three-dimensional spaces, an important question still remains: *can machines themselves experience the perspective of being water?* We proposed to include an LLM into the experience as documented in a previous publication [8]. This agent creates small dialogues, taking into account the current view of the user and the knowledge of itself being water. Then, a voice generator translates the text into speech creating an extra layer of audio, one that could serve as an internal voice for the user. Despite efforts of prompting to get ideal results, the LLM shows several limitations, both in the creativity of the outcomes and on how generic the idea of water is for the machine. It becomes evident that the nature of these language models is human-centered and that there is a clear lack of a perspectivist ontology in the training datasets. Nonetheless, the results are promising in showing that machines can also role-play non-living things, and may one day be able to show us the world from different perspectives, while also revealing the urge to make machines with a wider diversity of ontologies, perspectives and epistemologies.

Final Remarks

As a malleable material, digital media is subjective to the expression of perspectivism, being able to represent different points of view including those of inanimate beings such as water. However, the particular qualities of these media are often oriented to represent the human perspective, which is made evident in the way in which video and audio capture devices work, for example, mimicking the visual spectrum and human audible range, among other characteristics specifically similar to human senses. Moreover, inanimate beings also lack sensing and expressive organs like eyes or vocal chords, so the representation of their perspective of the world for human understatement can't be a mere one-to-one translation of their cognitive experience, but more of an expressive representation of such. Furthermore, we showed how perspectivism can serve also as a creative tool in operating these digital devices, mimicking the movements of the water and even releasing the camera to the river so that it operates by itself. In the case of generative technologies such as LLMs and language-driven diffusion models, we identified constraints in their perspectivism capabilities. Most evidently, this is re-

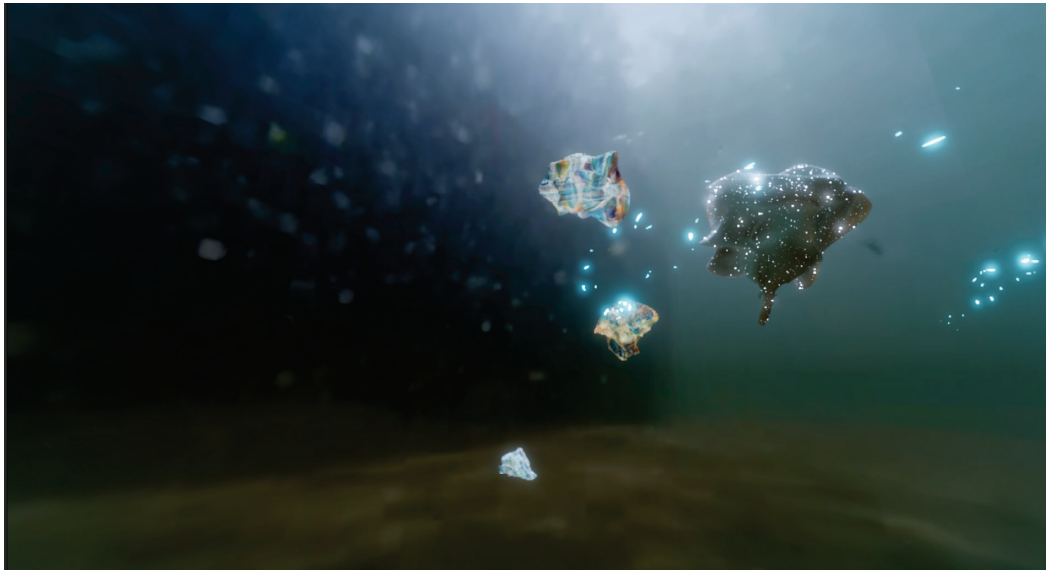


Figure 3: Still images of *Being Water*.

lated to a human-centric perspective of most of their training datasets, as the vast majority of text output is aligned to a modernist thinking that excludes the world-view of other living and nonliving beings.

However, it is possible to adapt these technologies into simulating some kind of perspectivist behavior, or to create a representation of a non-human perspective for humans to experience, as shown in this paper. We humans are also water beings; it is said that we carry the ocean within us, and this coming to water is a return to our primitive home, to our substance. In the words of curator Erika Balsom: "*This return obliterates the ego and undoes the hubris of rationality and its categories—including the distinctions between man and animal, culture and nature. Certainty cedes to unknowing. Better to give oneself over to the sea rather than pretend that we stand sovereign, able to fully fathom its depths*" [1].

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Authors Biographies

Andrés Isaza-Giraldo is a Colombian filmmaker and media artist, he studied Multimedia Art at the Faculty of Fine Arts in Lisbon. He is part of the Interactive Technologies Institute and the eGames Lab. His video practice question ideas of time and emotion in environmental systems.

Paulo Bala is a postdoctoral researcher at ITI/LARSyS, having received a Ph.D. in Digital Media from Universidade Nova de Lisboa. His research interests revolve around Human-Computer Interaction, Entertainment Technology, and eXtended Reality.

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