

Ecologies of Thought: Generative Art as a Collaborative Research Methodology with Guarani and Kaiowá Indigenous Communities

Matheus da Rocha Montanari

University of São Paulo, Polytechnic University of Valencia, Multimedia
Anthropology Lab (UCL). São Paulo, Brazil/ Valencia, Spain
matheusrmontanari@gmail.com

Abstract

The Ecologies of Thought project aimed to reconceptualize the relationships between ecological and technical knowledge, seeking an epistemological understanding that pushed beyond nature vs. culture divides. More than a conceptual and theoretical proposal, which was based on the technodiverse notion of cosmotechnics, the project developed practical and experimental methodologies in collaboration with the Guarani and Kaiowá Indigenous communities of Brazil to further this investigation. With an international and interdisciplinary partnership, we researched relationships between sounds and plants in indigenous cosmology and the ways in which these relationships can help us to more deeply understand a notion of ecology that is based on the poetics of care. With that, we created a series of collaborative virtual reality experiments using generative art processes, which proved to be an interesting methodology of artistic creation as research.

Keywords

Indigenous Communities; Generative Art; Ecology; Virtual Reality; Anthropology;
Cosmotechnics; Digital Art; Art as Research; Multimedia Anthropology; Guarani Kaiowa.

DOI

[10.69564/ISEA2023-18-short-Da-Rocha-Montanari-Ecologies-of-Thought](https://doi.org/10.69564/ISEA2023-18-short-Da-Rocha-Montanari-Ecologies-of-Thought)

Introduction

Between March and July 2022, the *Ecologies of Thought (1)* project established an international and multidisciplinary partnership between Indigenous communities of Brazil, artists, anthropologists, botanists, and audiovisual producers to investigate Guarani and Kaiowá ecological thought through the relationships between sound and plants. The project proposed dialogues among different types and conceptions of technology, from chanting and the traditional cultivation method, to the use of microcontrollers and data analysis.

This project is part of the *Guarani and Kaiowá Virtual Museum (2)*, which develops a virtual reality museum curated by the community elders and shamans – Nhandesys (female), and Nhanderus (male) in partnership with the Multimedia Anthropology Lab at University College London.

Since the beginning of the project, the community has been challenging and redefining the notion of a "museum," the extra-human relationships among plants, animals, instruments, and spirits present us with a complex challenge: how to maintain a Guarani and Kaiowá cosmotechnical fidelity in the museum?¹ That is, how to enable the indigenous cosmology, and its technologies, not only to inhabit the virtual space but to build it as a *tekoha*, a territory, that allows the exercise of the Guarani and Kaiowá way of being and living, *teko*.² That means, how to build a digital Guarani and Kaiowá *tekoha*?

To our surprise, in the first test of the museum presented to the community with the virtual reality headset, two Nhandesys, experienced chanters, saw *Jaras*, spirits, in the virtual space. From this encounter, we began to investigate different ways to explore the spiritual and cosmological aspects, which are so present in the Guarani and Kaiowá ecology of thought, within the museum. The relationship between sound and plants proved to be a fertile field for this research. We began to learn more from the community elders and apprentices who introduced us to chanting as a cultivation technology: a physical and spiritual dialogue between the plant, its spirits, and the chanter. To chant is to care for, and the poetics of care is essential for the development of a healthy territory, be it physical or digital.³

We learned that instruments are also people. And that the Guarani and Kaiowá notion of preservation is different. For example, if the instrument is kept and not used, even if in a collection, it loses its ability to produce

sound because it loses its ability to create connections when it is removed from its communication network. Therefore, it became evident the need to explore different ways to activate the collection we have been building for the museum.

To this end, we developed an experimental strategy. We focused on the creation of virtual reality worlds that, using generative art processes, explored the Guarani and Kaiowá cosmology from its cosmotechnical aspect. We used sounds and traditional elements, such as the *Chiru*, the sacred stick that supports the world, and the white corn, which is inhabited by one of the most important spirits (*Jakairá*), to investigate fundamental elements of the cosmology through an *experience*, rather than a *narrative representation*.⁴ In light of the urgent need to revise and rethink human-ecology relationships on a global scale, while acknowledging the new epistemic possibilities of data capture and analysis technologies, we collaborated with Guarani and Kaiowá community members to explore the different and creative kinds of data that these devices afford, and the ecological knowledge they make possible.

The Guarani and Kaiowá

Mato Grosso do Sul is a state in the mid-western region of Brazil, bordered by Paraguay and Bolivia, in a transition region between three biomes: Atlantic Forest, Cerrado, and Pantanal. It is the State with the second-largest indigenous population in the country and the largest outside the Amazon. The Guarani *Nhandeva* and Kaiowá population of the region in 2021 is estimated to be 63.5 thousand people. At the same time, the State has the second-worst land distribution index in the country, with large properties (> 1,000 ha) occupying 83% of the total area. Thus, it is not surprising that the region is a scenario of serious conflicts between landowners and indigenous people, especially in the area of cattle ranching, sugarcane, corn, soybeans, and eucalyptus plantations.⁵

The Guarani and Kaiowá are Guarani speakers, from the Tupi-Guarani linguistic trunk. They have a strong ancestral territorial bond, both physical and spiritual, which guides their struggle in an especially organized way since the large assemblies beginning in 1979 (*Aty Guasu*). These articulations occur mainly between the religious leaders, Nhanderus and Nhandesys, since the community considers that the simultaneous performance of the religious ritual (*jeroky*) "is fundamental to recover the dialogue with the invisible beings and the guardians of the ancient *tekohas*," that

is, for the recovery of the historical territories of their people, it is also fundamental to recover the extra-human relations developed in the territories, whether they are animal, vegetable, and/or spiritual.⁶

These relationships are directly connected to chanting and praying. The chant, besides a dialogue, is part of the materiality of the world: "In the understanding of the spiritual leaders, the singularities of the physical world inevitably need singing to continue their continuous existence, otherwise the world will gradually end."⁷ This is one of the reasons we choose sound, specifically chant, as a source of investigation of the ecological relations in Guarani and Kaiowá thought.

Artistic creation as an interdisciplinary collaborative methodology

The Guarani and Kaiowá cosmology have a great degree of complexity and diversity, even in the same family trunk, some stories may vary between one group and another. Moreover, the narratives are full of recursion and non-linearity, in which each detail branches off into another story, that can take days to be told in the traditional oral form. So, it was clear from the beginning of the project that there would be limitations on the form and amount of information we could present. At the same time, we did not want to make a reductionist narrative translation that would create a shallow representation of the generous exchanges that the project made possible.

Besides that, the diverse points of view and areas of knowledge involved in the project configure, simultaneously, its richness and complexity. The challenge of combining shamans, scientists, and artists in the same project revealed the power of the digital medium as a research tool in itself, and not only as a form of scientific dissemination. More than that, we set out to develop research *in* visual arts, rather than research *about* visual arts. That is, to reaffirm the processes of creation as valid ways of researching, thinking, and producing knowledge about the world.⁸ In this sense, artistic creation acts in the project as a collaborative methodology capable of providing dialogues and investigative interactivity: the creation processes allowed for the creation of a two-way exchange, in which collaboration affected not only the production but the understanding and direction of what was being produced.

In this project, art, which occupies a liminal place, is not limited to an art-technology extension of scientific knowledge. We seek to embrace the *mba'e kuaa*, the Guarani and Kaiowá technical knowledge and know-how. In this proposal, we guide ourselves with the concept of cosmotechnics developed by Yuk Hui. That is, to rediscover the diversity of technical thought beyond the Greek notion of *techné*:

Technology is not anthropologically universal; its functioning is assured and limited by particular cosmologies that go beyond mere functionality and utility. Thus, there is no single technology, but a multiplicity of cosmotechnics.⁹

Generative Art and the Guarani & Kaiowá Cosmology

Generative art can be defined in different degrees of complexity, it is associated with a system that has some degree of autonomy, in which the artist and the system exercise a series of operations that result in the final work.¹⁰ Seeking ways to engage with the mythology and respect their characteristics, generative art methodologies seemed to not only fit with the ontological qualities of the Guarani and Kaiowá cosmology but to privilege an investigation and audiovisual production that could maintain a cosmotechnical fidelity. Since both, the Guarani and Kaiowá cosmology and generative art are nonlinear emergent processes with repetitive elements that are in constant transformation. Working in that direction, we created a series of six experiments, and in this article, we will be presenting one of them.

Jakairá: white corn, bees, and the maintenance of the world

According to the Kaiowá myth, the deity Jakairá is responsible for the creation of the first roçado (food garden). Through his wisdom, Jakairá created the white corn, which is at the top of the food hierarchy, and, from it, all other agricultural products were created. Therefore, Jakairá and white corn are responsible for the creation and maintenance of almost all food on Earth. Its cultivation follows a series of rules, from dietary restrictions of the growers to the use of chants to cheer the corn and its baptism.¹¹ The corn baptism ritual, called *Jerosy Puku*, is one of the most important Kaiowá rituals. Through it, the corn becomes fit for consumption by the community in a healthy way, since, besides being

a physical food, it is also considered a spiritual food. The baptism is also a moment of reaffirmation of the Kaiowá way of being, strengthening the human and extra-human (spirits, plants, animals) relationships of the community.¹² This specific type of corn is currently in danger of extinction due to the environmental threats it suffers, the heavy use of pesticides in the GMO corn plantations that surround the communities, and the consequences of climate change in the region.

Our first experiment arises precisely from this extrahuman ecology. In one of our ethnographic sessions on the importance of corn and its relationship to sound, we learned that corn has its own sound that is not audible to all people. However, there is a specific moment when the sound of corn can be heard by everyone. The community members told us that when the corn, still green (avati kyry), begins to mature and get ready for harvest, it produces a smell that attracts bees so that "they can make the sound of the corn," warning the cultivator that it is almost time to harvest. As talking about the white corn is also talking about the beginning of life and the food that sustains it, this pre-harvest moment, when the bee is attracted to the corn to make its sound, seemed emblematic to us to investigate an instant of the creation of the world according to the Guarani and Kaiowá cosmology. This moment that seems, at first sight, to deal with a multispecies relationship between the plant and the bee, when further investigated, reveals, also, to be a relationship between the spirit owner of the corn and its cultivator¹³. To continue this investigation, we developed a generative art experiment using the *TouchDesigner* programming language: a visual programming language in nodes for the creation of real-time interactive multimedia content. We started with the image of a white cornfield before the harvest and analyzed the light incidence in its different areas. From this data analysis, we created a relief map that was applied to an ellipse for the construction of a terrain. The darker areas of the image created depressions, and the lighter areas, elevations. Finally, we added two noise layers, one algorithmic, and another from the sound analysis of the frequencies produced by the bees. The sound frequency analysis controls the algorithmic noise, which generates motion on the terrain. With that, we exported a 360o video for VR headsets. In this way, we developed a virtual reality experience in which the ecological relationship between the corn and the bee produces the creation of a generative world based on the analysis of image and sound data from the field, guided by the Guarani and Kaiowá cosmology (figure 1).

Even without a naturalistic production of the image, and perhaps precisely because of this characteristic, the community approved the experiment. Once the step-by-step construction of the generative program was presented, there was consensus that the experiment had true Guarani and Kaiowá characteristics, mixed with non-indigenous technology. From this experiment on, the community began to direct the following more directly, choosing images and elements that should be used for the continuation of the project.



1. Still from the VR experience – Generative Terrain produced by the data analysis of the white corn and the bee's sounds.

Conclusion

The *Ecologies of Thought* project aimed to reconceptualize the relationships between ecological and technical knowledge, seeking an epistemological understanding that pushed beyond nature vs. culture divides. More than a conceptual and theoretical proposal, which was based on the technodiverse notion of cosmotechnics, the project developed practical and experimental methodologies in collaboration with Guarani and Kaiowá communities to further this investigation.¹⁴ With an international and interdisciplinary partnership, we researched relationships between sounds and plants in indigenous cosmology and the ways in which these relationships can help us to more deeply understand a notion of ecology that is based on a poetics of care.

Thus, we were able to bring together poetic and technical processes to propose a mixture of knowledge that beyond an explanation or representation of one form of knowledge into another, develops an experience of its own. This allows us to fight an idealized naturalistic representation of indigenous culture, which fails to understand indigenous thought and technologies as valid ways to build and think of a cosmotechnic for our time.

More broadly, this project seeks to undermine the romantic and colonial notion of preservation, which does not consider the indigenous presence a digital presence, able to act and think about technical processes since its conception. This means, beyond an illustrative representation of what is believed to be the material and immaterial cultural heritage of the community, to collaboratively build a digital-indigenous territory, a digital Guarani and Kaiowá *tekoha* where a new technological ontology is established, in a way that the very conception of contemporary technology is affected by indigenous cosmotechnics.

In conclusion, the epistemic research proposed and developed during the project revealed to us the potential that this collaborative methodology possesses to go beyond epistemological investigations, enabling us to revisit ontological questions of technology. Collaboration, interdisciplinarity, and the investigation of creative processes—rather than the proposition of representations—allows us to arrive at questions related to the level of *existence*, so that, in the anthropogenic era of the absence of futures, we can compose a cosmotechnic for a viable, virtual and actual, reality, based on a poetics of care and more-than-human relations.

Acknowledgments

We would like to acknowledge the University College London Global Engagement Fund which contributed to the partnership among the Multimedia Anthropology Lab at University College London, the Kunangue Aty Guasu, IDAC, The School of Botany, The University of São Paulo, The Federal University of Santa Catarina.

We would like to thank and acknowledge the generosity of the Nhandesy and Nhanderus whom we have been working with during these years. Nhandesy Neuza Alziro, Nhandesy Ivone, Nhandesy Fausta Solano Mendosa e Nhandesy Roselí Aquino. Nhanderu Tadeu Romeiro Freita, Nhanderu Valdomiro Oswaldo Aquino. Also, the team of UCL's Multimedia Anthropology Lab and the Kunangue Aty Guasu: Valdineia Aquino, Scott Hill, Luan Iturbe, Germano Alziro, Jaqueline Gonçalves, Raffaella Fryer-Moreira, Fabi Fernandes, Gerard Oliver, Adriana Boloc, Stephanie Ferraz, Clara Ciqueira, Luiza Braga and MAL's translation team. And our partners Karola Braga, Anderson Santos and Caetano Sordi.

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 88887.716693/2022-00.

(1)

<https://www.matheusmontanari.com/ecologiesofthought>

(2) <https://www.uclmal.com/virtual-museum>

References

- 1 Yuk Hui, *The question concerning technology in China: an essay in cosmotechnics*, Falmouth, Urbanomic, 2018.
- 2 Tonico Benites, "Trajetória de luta árdua da articulação das lideranças Guarani e Kaiowá para recuperar os seus territórios tradicionais tekoha guasu," *Revista de Antropologia da UFScar*, Vol. 04, No. 02, accessed October 14, 2022, <https://doi.org/10.52426/rau.v4i2.83>
- 3 Matheus Montanari and Gilbertto Prado, "From vigilance to vigil: an introduction to an alternative paradigm for technology, art, and life," *Diffractions*, Vol. 01, No. 05, accessed October 14, 2022, <https://doi.org/10.34632/diffractions.2022.10194>
- 4 Fabio Mura, "A Trajetória dos Chiru na construção da tradição de conhecimento Kaiowá," *MANA*, Vol. 16, No. 01, accessed October 14, 2022, <https://doi.org/10.1590/S0104-93132010000100006>
- 5 Anderson de Souza Santos, Luiz Henrique Eloy Amado and Dan Pasca, "“É muita terra pra pouco índio”? Ou muita terra na mão de poucos? Conflitos fundiários no Mato Grosso do Sul," *Instituto Socioambiental*, accessed October 14, 2022, <https://acervo.socioambiental.org/acervo/documentos/e-muita-terra-pra-pouco-indio-ou-muita-terra-na-mao-de-poucos-conflitos>
- 6 Tonico Benites, "Trajetória de luta árdua da articulação das lideranças Guarani e Kaiowá para recuperar os seus territórios tradicionais tekoha guasu," *Revista de Antropologia da UFScar*, Vol. 04, No. 02, accessed October 14, 2022, <https://doi.org/10.52426/rau.v4i2.83,171>
- 7 Izaque João, "Jerisy Puku," *PISEGRAMA*, Vol. 01, No. 06, accessed October 14, 2022, <https://piseagrama.org/jerisy-puku/1>
- 8 Sandra Rey, "Por uma abordagem metodológica da pesquisa em artes visuais," in *O meio como ponto zero*, ed. Bianca Brites and Elida Tesser, Porto Alegre: Editora da UFRGS, 2002, 123-140.
- 9 Yuk Hui, *Tecnodiversidade*, São Paulo, Ubu, 2020, 25.
- 10 Philip Galanter, "Generative Art Theory," in *A companion to digital art*, ed. Christiane Paul, Hoboken, John Wiley & Sons, 2016.
- 11 Izaque João, "Jerisy Puku," *PISEGRAMA*, Vol. 01, No. 06, accessed October 14, 2022, <https://piseagrama.org/jerisy-puku/>
- 12 Izaque João, "Jakaira Reko Nheypyrũ Marangatu Mborahé: Origem E Fundamentos Do Canto Ritual Jerisy puku Entre Os Kaiowá De Panambi, Panambizinho E Sucuri'y, Mato Grosso Do Sul", Master's. diss., Programa de Pós-Graduação em História da Faculdade de Ciências Humanas, Programa de Pós-Graduação em História da Faculdade de Ciências Humanas, 2011.

13 Carlos Fausto, "Donos demais: Maestria e Domínio na Amazônia," *MANA*, Vol. 14, No. 02, accessed October 14, 2022, <http://dx.doi.org/10.1590/S0104-93132008000200003>

14 Yuk Hui, *The question concerning technology in China: an essay in cosmotechnics*

Author Biography

Matheus Montanari is a Ph.D. Candidate at the University of São Paulo in Visual Arts, and external researcher at the Polytechnic University of Valencia. He develops works at the intersection of art, science and philosophy, investigating ways to rethink technology after art. He is interested in cosmotechnical diversities, and in combining decolonial ecological thinking with technical know-how. Recently he has been developing his practice in collaboration with indigenous Guarani and Kaiowá communities in Brazil. He has exhibited his work in Brazil and abroad, in countries such as: Argentina, Portugal, Austria, Croatia, China, Spain and Italy. He was awarded the web art category prize of the 67th Contemporary Art Salon of Paraná.