

Dancing Data: When Choreography is Written by Trees

Olga Kisseleva, Anton Orel

Symposium *Dancing Data : an intimate link to the living*

National Botanical Conservatory of Mascarin, Saint-Leu, Reunion Island, February 2024

Abstract

The article describes the main features of the EDEN project. The article describes the main features of the Dancing Data research project led by Olga Kisseleva, which is attempting, in an interdisciplinary collaborative mode, to create new languages for choreographic notation. This research is based on the technologies for notating nature's communication developed by Olga Kisseleva in her famous EDEN (Ethical Durable Ecology Nature) project, awarded by the European Community.

The essence, direction and structure of this technique is a unique development that underpins the plasticity of modern dance. Laban's system considers three conventional components of the human body, the parameters of movement analysis (in relation to dance) and the preconditions for the formation of motor patterns that ensure the organization of visual language.

A link is also established with the life cycle of trees and its similarity to the technique of choreographic notation. The further development of a new notation language is proposed as a way of continuing research on the subject.

Keywords

EDEN, Dancing Data, dance notation, contemporary dance, native art, motion analysis, trees, environment.

Introduction

Dance notation languages are systems used to record and analyze dance movements. They provide a way to document choreography, preserve dance works, and facilitate communication among dancers, choreographers, and researchers. While dance notation languages are primarily human-created systems, one could draw connections between them and nature in several ways:

- **Mimicry of Natural Movements:**

Some dance forms are inspired by or directly mimic natural movements. For example, traditional dances in various cultures may incorporate elements inspired by animals, plants, or natural elements. In this sense, dance notation captures the essence of these movements and their connection to the natural world.

- **Rhythm and Cyclical Patterns:**

Many dances are structured around rhythmic patterns, which may be linked to natural cycles such as the seasons, the phases of the moon, or the heartbeat. Dance notation,

especially when representing rhythmic elements, can indirectly reflect the cyclical patterns found in nature.

- **Spatial Awareness and Geometry:**

Dance notation often involves the use of spatial symbols and geometric shapes to represent movement in a given space. These spatial elements can be related to patterns found in nature, such as the symmetry in flowers, the spirals in seashells, or the movements of celestial bodies.

- **Expressing Emotional Connections:**

Dance, as an art form, often explores human emotions and experiences, and these can be connected to the broader human experience in nature. Dance notation captures the emotional content of movements, reflecting the human connection to the natural world and the expression of feelings inspired by it.

- **Cultural and Ritualistic Connections:**

Many traditional dances have deep cultural and ritualistic roots, often connected to natural events or cycles. Dance notation can document these cultural expressions, preserving the link between a community's traditions and its relationship with nature.

- **Inspiration from Natural Environments:**

Choreographers may draw inspiration from natural landscapes or elements, and dance notation helps capture these inspirations in a structured form. Movements may be designed to evoke the feeling of wind, water, or other natural phenomena.

Origins and Roots

The work started with the EDEN project.

EDEN (Ethical Durable Ecology Nature) is a concept created by Olga Kisseleva, a cross-disciplinary French artist who uses video, immersive virtual reality, and AI to create large-scale art installations and performances. With EDEN, Kisseleva aims at reinventing with art and technology traditional scientific approaches to environmental issues, notably the survival of trees. With two objectives in mind, listening and repair, she uses artistic experimentation as a way to protect and prevent. Through the capture of data from the vegetal world treated as a living and communicating being, she conceives artistic interpretations that become a living metaphor of a biological network. In "EDEN: The

cries and Whispers of Trees” presented at the 2018 Echigo-Tsumari Triennale she linked the threatened Australian Wollemi Pine with ancient trees in Japan and Paris to support their survival through “listening to each other”. With her imagined tools, Kisseleva connects trees to trees, trees to humans, and trees to memories.

The specificity of this project is determined by the experience and interests of the artist, who works mainly in installation, science, and media art. Her work employs various media, including video, immersive virtual reality, AI, performance, large-scale art installations, and interactive exhibitions. Olga Kisseleva's approach to her work is much the same as a scientist's. A discrepancy detected during a procedure or within the workings of a structure obliges her to formulate a hypothesis, in order to explain the complication in question, and wherever possible, to propose a solution to the problem. She then determines the skills necessary to pursue the relative study and commissions the research. The artist calls upon exact sciences, on genetic biology, geophysics, and also on political and social sciences. She proceeds with her experiments, calculations and analyses, while strictly respecting the methods of the scientific domain in question. Her artistic hypothesis is thus verified and approved by a strictly scientific method.

In each of Olga Kisseleva's projects, at each stage of its development, from the initial draft (when the context is taken into consideration), until the moment when the indications allowing the esthetic propositions to come to light are gathered together, a line is traced upon which the different elements convened are inscribed. This way of addressing places and people allows the artist to take on an unusual position, a kind of involvement consisting of questioning, affronting or testing the elements constituting the reality of a situation in which she can borrow from numerous mediations, supports and modes of representation as diverse as the situations themselves. Yet it still implies, for the viewer as well as the artist, a certain faithfulness to a watchword - vigilance - returning to a principle of responsibility, and implying the establishment of open relationships between the different elements brought into play by esthetic propositions.

New Research

The new branch of EDEN called “Dancing Data” starts in 2020, follows Kisseleva's residency in Sidney Artspace and in Bundanon in 2019 and concludes an important art & science research on native Australian trees, especially on *Wollemi Pine*, one of the world's oldest and rarest plants, and the most dramatic comeback in natural history. will be the first embodied incarnation of her concept, placing dance at the core of a new large-scale participatory work directly written by the trees.

Scientific Environment and Context

Olga Kisseleva's work was supported by MARCS Institute for Brain, Behaviour, and Development and the Hawkesbury Institute for the Environment and realized in collaboration with the scientific teams of these institutions, both part of Western Sydney University.

In the space of just a few years, the The Hawkesbury Institute for the Environment has rapidly become the leading center of excellence in ecosystem function and environmental responses to changing climates with a strong reputation for delivering research outcomes of the highest quality. With a unique suite of world-class research facilities, the Institute is ready to collaborate with Australian and international institutions.

The Institute's team of over 50 scientists conducts innovative, world-class research across the full spectrum of life from genetic level to ecosystem level to answer the most pressing issues currently facing our country such as: What will rising CO2 levels mean for forestry, soils and our agricultural industries? How closely do CO2 prediction models match real-world changes in plant and ecosystem function? How does environmental change impact on plant, animal and microbial communities? How can we use technology to understand and better manage our most important natural and managed ecosystems in a changing world?...

The Institute's integrated research portfolio is aligned around three broad themes: Soil Biology and Genomics; Plants, Animals, and Interactions; Ecosystem Function and Integration.

These research themes lead to worldwide collaborations and partnerships with government, research, and industry organizations to jointly tackle the largest environmental and scientific challenges of our time.

The MARCS Institute for Brain, Behaviour, and Development conducts world-class interdisciplinary research that advances knowledge and finds sustainable solutions to practical problems concerning human interactions, new technologies, and our interaction with the environment. The Institute's vision is to optimize human interaction and well-being across the lifespan. MARCS Institute strives to solve the problems that matter most through the themes of sensing and perceiving, interacting with each other, and technologies for humans.

For 20 years, the MARCS Institute for Brain, Behaviour, and Development has led advances in the understanding of how the human brain develops across the lifespan and how it responds to visual, auditory, sensory, and technological stimuli. Its mission is to understand and optimize the brain and its research makes a difference whether it be unlocking creativity, helping people process information and make effective decisions under stressful conditions, improving

learning outcomes or detecting and treating brain disorders and diseases earlier.

The Institute invests in state-of-the-art laboratories, performance spaces, and equipment and brings together psychologists, linguists, engineers, biologists, performers, and cognitive neuroscientists to collaborate with partners across health, defense, policy, data sciences, and the arts.

Since 2017, the Institute's research and innovation in biomedical technologies have been spun out three times and have appeared on the cover of leading journals. New assessment tools for child language production and reception have been designed for Australia's diverse population. These tools – the OZI-SF and ERLI – are normed by training Australian parents to record the data within the family setting and are being used by allied health teams and primary health networks (GPs) around Australia. 'Moody Tunes', a Spotify-like app for adolescents who are at risk of poor mental health, has been co-designed with young people. The Moody Tunes app combines self-selected music and mood tracking to support mental health literacy and awareness. The proof of concept is now in its next stage of development, aiming for wider release. The "Smart Gloves" device, to support training in robotic surgery, is currently being trialed.

MARCS continues to bolster its reputation as an international leader in auditory and multimodal perception, cognition, and lifespan development. Building on research excellence in core fields of research, the Institute continues to conduct world-class basic research and provide exceptional research training for HDR students, postdoctoral fellows, and early career researchers.

The artwork was commissioned by FORM Dance Projects, and conducted in collaboration with collaborative process facilitators: Chris Tobin, First Nations Cultural Advisor and Dr Julie-Anne Long, Lecturer in Dance and Performance in the Department of Media, Music, Communication and Cultural Studies at Macquarie University in Sydney.

FORM Dance Projects is a dynamic hub for Australian contemporary dance based in Parramatta, Central Sydney. FORM has grown into one of Australia's leading dance presenters. FORM's program spans five areas - presentation, production, education, community engagement, and audience development. Its aim is to support Australian choreographers in all stages of their careers; develop artists' profiles; provide professional development opportunities; engage with the local community in meaningful ways; and connect with audiences. Since 2013 FORM's program has encompassed genre-defying large-scale productions with the aim to provide professional development for artists and develop new audiences for contemporary dance, like recently KAIROS (Sydney Festival, 2023) directed by legendary Australian choreographer Meryl Tankard, with Australian "most popular" composer, Elena Kats-Chernin.

The presence of the First Nations Cultural Advisor was very new, and important for Olga Kisseleva, realizing her first Australian working experience. Chris Tobin is a Darug man from Western Sydney. He works as an Aboriginal cultural presenter, and public speaker offering an insight into local Aboriginal history and heritage to all ages that wish to learn. He has served on a number of advisory boards, councils, and committees over the years and was one of seven elected Darug representatives to meet with the State government in 2006 to try and work out an ILUA (Indigenous Land Use Agreement) as part of the Native Title process. In 2017, Chris helped establish the Aboriginal room at the historic Woodford Academy.

From Traditional Notation to New Choreographic Languages

Existing languages

The performance and video installation draws inspiration from the translation of the trees' communication into a dance notation language, such as *Laban*, *Benesh Movement Notation*, *Eshkol-Wachman Movement Notation* (EWMN), or any choreographic notation language the collaborating artists may choose to work from.

Finally we started with two languages: Laban concept and choreographic notations and Eshkol-Wachman Movement Notation, before to suggest each choreographer to develop together a special language on the cross road between the transcription of the tree communication we realized during the workshop and his/her own practice.

Rudolf von Laban concept and choreographic notations

Any movement have a starting point, a static position, a state of rest, the process of the movement itself (a certain number of static positions), and the end of the movement - an endpoint (again a static position). The static position of the movement is equivalent to the dancing pose.

The dance consists of alternating movements and static positions, i.e. poses. When connecting, they form a dance outline.

The process of movement, just like a static position, can have a different time duration. Almost always, the dance has a certain rhythmic structure, which is expressed either by beating or musical accompaniment.

All parts of the body are involved in a person's movement: legs, arms, body, and head. Movement of different parts of the body can occur in different directions - forward, backward, sideways, by rotation, bending, lifting off the support, etc.

To determine the degree of movement, a starting point must be taken, a norm, a constant from which all deviations proceed. Both the initial position, the movement process itself, and the final position can have different time durations.

In the 20th century, notation systems emerged that were capable of recording any human movement while maintaining the absolute time duration of the movement and in three-dimensional space.

The most advanced and popular systems of this type (Labanotation) include the system of R. Laban and the system of the spouses Rudolf and Joan Benesh. The R. Laban system has existed in world practice for 80 years. As a result, it was concluded that R. Laban's system is capable of recording any human movement in accordance with the categories of space and time.

To conduct an analytical study of movements, R. von Laban divided the human body into 3 components:

1. Head - a control center responsible for self-awareness, mental activity, and emotional perception of reality;
2. Torso – the area of processing consumed substances (air, water, food), purification, and reproduction;
3. Limbs - parts of the body that perform movement of the entire body, various movements, and gestures.

Other famous dance notation systems are the following:

- Benesh Movement Notation;
- Eshkol-Wachman kinetic notation;
- Shorthand Dance Notation;
- Morris Dance Notation;
- Beauchamp-Feuille Notation;
- Conté movement notation;
- Micromotion studies;
- and others.

A very interesting prospect is the improvement of Labanotation using methods:

- machine learning
- paralinguistic methods of non-verbal communication (body language, postures, gestures, eye contact);
- proxemics in general;
- virtual and augmented reality technologies;
- additional sensors (eye-tracking, heartbeat and blood pressure sensors, pupil size changes) for exploring emotions and internal energy details of dancers;
- Google glasses or other similar devices.

All of the above is a promising prospect for creating a new system of choreographic notations and requires additional research in the future.

There are also several software products available for graphically displaying human movements. The most famous are LabaNotator and LabanWriter.

Eshkol-Wachman Movement Notation (EWMN)

EWMN describes movement using a geometrical model that

allows the user to observe and notate movement in an objective way, free of verbal ambiguity and emotional attachment. The notation utilizes a spherical system of coordinates, similar to latitude and longitude on a globe.

First, Noa Eshkol and Abraham Wachman set out to find ways to objectively describe the components of human dance movements, and the hierarchy of their subordination in the dance process and created the so-called Eshkol-Wachman Movement Notation (EWMN). It was first used for tasks of choreography (objective description of dancers' body movements and the spatio-temporal structure of dance) and then applied to the "choreography" of exchange of demonstrations in animal interactions, such as "ritualized fighting" in wolves, in understanding motor-coordination problems resulting from defects social communication in autistic people, the development of methods for their therapy, etc. The best known here are the works of Ilan Golani in the 1970s and 80s.

Noa Eshkol wrote five dances designed to be performed without music to focus on the inner emotions they evoke. Let me emphasize once again that from the very beginning it was a system for recording body movements, not dance - in the second case, the functional aspect is inevitably introduced into the description. She believed that through movement analysis we could understand how certain movements evoked certain feelings and that using movement recording could help us discover the laws of composition for certain dance styles, just as it had already been done for music and other forms of art.

New Languages Inspired by Trees Communication

One of the main ideas during this project was an attempt to create new dance notation languages using Olga Kisseleva's artistic competences, scientific principles of natural communication transcription and a series of chorographical experiences. That is why we asked five leading Australian choreographers based in Sydney (Vicki Van Hout, Raghav Handa, Ryuichi Fujimura, Rhiannon Newton and Chloé Fournier) to join the research group.

GD-FNAT - Gestures and Drawing from the First Nation Ancestral Tradition

First we worked on the First Nation Tradition with the Indigenous artist Vicki Van Hout.

Vicki Van Hout is an independent artist with Wiradjuri, Dutch, Scottish, and Afghan heritage, and over 20 years of experience as a director, choreographer, performer, dramaturge, and mentor. She has an outstanding and sustainable contribution to Australian dance and the impact on Australia's cultural narrative through "her commitment to

charting new territories through her work, challenging existing stories and prompting contemporary conversations.

Vicki's proposal focuses on her preoccupation with inserting an indigenous agenda into all of her actions, and on the fact that science is also integrated through metaphor into the narrative and into many of the stories of reclamation. The drying up stories are like surrealist or magical surrealist stories where all the elements are anthropomorphized. She was interested in this whole idea before embarking on this project, namely that trees are parents. That's why she was so interested in Olga Kisseleva's suggestion that trees communicate.

From day one, Vicki Van Hout wanted to create a story that explored or articulated the idea that we can communicate with any object, whether living or non-living. Finally the language of notation we imagined with her is ultimately inspired by gestures and drawings from native and ancestral tradition.

GThOT - Glyphs and T-high Rhythm Originated in Trees

The scientific dimension of the natural communication transcription was especially present in through the collaboration with Raghav Handa.

Raghav Handa is an Australian choreographer and performer of Indian origin, trained in modern and indigenous contemporary dance. Inspired by his origins, his work combines traditional Kathak principles with contemporary movement to create multiple and compelling explorations of international and post-modern cultural identity. He has worked in a variety of roles in dance: choreographer, performer, collaborator and director.

During the workshop led by Olga Kisseleva, he was very interested in the concept of indigenous and exotic trees and the meaning of exoticism that could be applied to a tree, but also to someone else, for example a person. Raghav Handa fully embraced Olga Kisseleva's proposition that trees are not just a material, a natural biological material, but they are like a repository that preserves our climate, our memory, our human function, our human memory and they are a bit like guardians of time. The rings they create bear witness to this. So the idea of time also runs through her choreographic proposal. By communicating with the tree, the artists go back in time to extract temporal memory, because in trees, time is circular through the rings.

To transcribe this time, Raghav Handa first uses a system of glyphs inspired by Kathak. This system gives us a fairly visual language, which we can then use to create a sign language, to ultimately communicate a narrative to another collaborator.

To implement this system of glyphs, with Raghav Handa we

used the T-high rhythm: a classic North Indian rhythmic pattern that originated in trees. From this rhythm we can create a danced conversation in duet, in group, or to work individually to set up a spatial and cyclical motif. The motif is the first element of a dance language that translates the data from the tree into a rhythmic and verbal language that enables us to communicate with our fellow collaborators.

LFS - Languages of the Five Senses

Chloé Fournier is a French-born Australian multi-disciplinary artist trained as well as Olga Kisseleva at the Theatre de Absurde. She works as a dancer, physical theatre performer, choreographer, director, actor, dramaturge and curator.

Our proposal with Chloé Fournier was to transpose her sensual experience during the workshop and the artistic intervention by Olga Kisseleva and the choreographers, into equally sensual objects through smell, touch, taste... We built a correlation between what the choreographer had noticed and her usual practice in the context of memory, memorizing as many moments as possible of this sensual transcription of communication with trees, transforming her memories into keywords, or rather key objects. In our particular experiment the objects used were little wooden ducks, herbs, an apple, pieces of bark, but also the parts of the participants' bodies: the nose, the fingers, the tongue...

Instead of imposing a pre-conceived choreography, this language presupposes offering the dancer the object to explore, while suggesting the pattern of interaction. The choreography that follows is an improvisation in response to the feeling experienced.

EC - Environment and Conditions

The experience build with Ryuichi Fujimura was the most tree-inspired.

Ryuichi Fujimura is an independent dance artist of Japanese origin and culture, and based in Sydney. Since the mid-1990s, he has studied contemporary dance techniques as well as improvisation and choreography in Australia and overseas. Over the last two decades, he has enjoyed dancing, performing, creating, and collaborating with other artists of various disciplines.

In response to Olga Kisseleva's proposal the choreographer suggested a new approach with an interesting phenomenon based on ideas about the seasons, weather conditions, sensations, and other related phenomena characteristic of these external conditions. Under the direction of Ryuichi Fujimura, the dancer lives like a tree in the nature, subject to metrological conditions, and to the environment. Influencing her body, these external conditions impose gestures and

positions that form the choreography. As well as the time intervals of the furnace and movement based on them depending on time.

TIE - Transcription of the Internal Energy

Rhiannon Newton is an Australian dancer and choreographer whose creative work also draws attention to the interconnection of the body and the more-than-human world. From 2019-2021 Newton co-directed the artist-led independent dance organization Ready-Made Works Inc. and continues to co-curate the performance-lecture series Talking Bodies.

In the frame of the project developed by Olga Kisseleva, our proposal with Rhiannon for developing a new language is based on internal energy. Trees eventually draw their form from solar energy, which has previously been accumulated and transformed through photosynthesis. In the same way, the choreographer transforms the message received from the trees into an accumulation of internal energy, which then conditions the danced forms.

Conclusion

In conclusion, let us try to find the connection between choreographic movements and their notation with trees.

The first thing that comes up is the idea of the life cycle of a tree, starting from the seed entering the soil over a certain time interval (depending on the plant).

1. Juvenile stage or stage of youth. This is the period of initiation, growth, and development of vegetative organs from the germination of a seed or vegetative bud to the emergence of the ability to form reproductive organs.

It is characterized as a period of vigorous vegetative growth, due to which the plant relatively quickly reaches a size that provides it with a place and existence in the environment.

2. The maturity stage is the time of flowering and fruiting. During this period, the tree still grows very intensively.

3. The stage of old age is the period from the complete cessation of fruiting to the natural death of the plant. This period naturally ends the functional life of the plant. It is characterized by a slowdown in growth and the death of branches from the top to the base.

The tree grows in a natural environment and is exposed to natural factors such as flowering, drought, wind, moisture, temperature changes, thunderstorms, ozone load, groundwater, soil type, and other weather conditions. All this affects the growth\dying\falling of parts of the tree and therefore is a movement over a certain time interval.

At each stage, as in conducting an analytical study of

movements according to the method of R. von Laban, who conventionally divided the human body into 3 main components (head = tree crown, leaves, torso = tree trunk, limbs = branches, roots), which in turn, have 3 main components (energy-force, time-tempo, space-environment).

Also, do not forget about the physical impact on the tree (humans, insects, or animals).

Some contemporary dance works explicitly explore ecological themes or environmental concerns. Dance notation can be a tool to document and analyze these choreographies, serving as a record of artistic responses to nature and environmental issues.

While dance notation languages are human inventions, they often mirror and express our connections to the world around us, including the natural environment. The symbolic language of dance notation can capture the essence of movement inspired by nature and the cultural, emotional, and ritualistic aspects of our relationship with the natural world.

Finally, by increasing the traditional forms of dance notation, like Laban, with the different ways of transcribing and understanding the communication of nature, we arrived at the brand-new approaches to choreographic notation and forms. Thanks to the exploration carried out as part of the "Dancing Data" project with the five choreographers of very different origins and methods, Olga Kisseleva and her collaborators were able to sketch out five new perspectives for the five new dance notation languages:

- GD-FNAT - Gestures and Drawings from the First Nation Ancestral Tradition
- GThOT - Glyphs and T-high Rhythm Originated in Trees
- LFS - Languages of the Five Senses
- EC - Environment and Conditions
- TIE - Transcription of the Internal Energy

This could be considered as an innovative step towards improving contemporary dance and associated languages.

Based on the above, further research and additional study is needed. It is at moment in progress in Australia, as well as across the Indian Ocean by studying and including the diversity of the choreographic traditions of the islands and the diversity of their natural environment.

Bibliography

- Alder, John, David Wilkinson, and Ilona Cheyne. *Environmental law and ethics*. London: Macmillan, 1999.
- Arendt, H. *Responsibility and judgment*. Schocken 2009.
- Bockaert, J. *La Communication du vivant. De la bactérie à Internet*, Odile Jacob Sciences, 2017.
- Bonneuil, and J.B. Fressoz, *The Shock of the Anthropocene*, Verso, 2017.
- Canabate, A., *L'écologie et la narration du pire*, Utopia, 2021.
- Chardel, P-A., Avenati O. (eds.), *Datalogie. Formes et imaginaires du numérique*, Editions LOCO, 2016.
- Demos, T.J., *Against the Anthropocene: Visual Culture and Environment Today*, Sternberg Press, 2017.
- Demos, T. J., *Decolonizing Nature: Contemporary Art and the Politics of Ecology*, Sternberg Press, 2016.
- Gadgil, M., Berkes, F., and Folke Ambio, C., *Indigenous Knowledge for Biodiversity Conservation*, Biodiversity: Ecology, Economics, Policy, N°2/3, vol. 22, Springer, 1993.
- Guattari, F., *Les trois écologies*, Paris, Éditions Galilée, 1989.
- Guattari, F., *Chaosmose*, Paris, Éditions Galilée, 1992.
- Hall, M. "Talk among the trees: animist plant ontologies and ethics". In *The handbook of contemporary animism* (pp. 385-394). Routledge 2014.
- Imamichi, T., *An Introduction to Eco-Ethica*, traduit par Judy Wakabayashi, Lanham, MD, University Press of America, 2009.
- Kisseleva, O., Mello-Vianna, G., "Paysages en voie de disparition: l'ancestro-futurisme selon les Pataxó Hã Hã Hã", in *Art et écologie : des croisements fertiles? - Plastik Art & Science #09*, directed by Agnès Foiret-Collet, Editions de la Sorbonne, 2020
- Kisseleva, O., "Prêtez l'oreille aux arbres", in *L'intelligence des plantes en question*, Marc-Williams Debono (dir.), éd. Hermann, 2020.
- Kohn, E., *Comment pensent les forêts: vers une anthropologie au-delà de l'humain*, Zones sensibles, 2013.
- Krogh, M. (ed.), *Connectness. An Incomplete Encyclopedia of the Anthropocene*, Strandberg Publishing, 2020.
- Latour, B., *L'espoir de Pandore: pour une version réaliste de l'activité scientifique*, Paris, Editions La Découverte, 2001.
- Merleau-Ponty, M., *Le visible et l'invisible*, Paris, Editions Gallimard, 1964.
- Merleau-Ponty, M., *Le primat de la perception et ses conséquences philosophiques*, Verdier, 2004
- Rendtorff, JD, "From Philosophy of Technology to Bioethics and Biolaw: Challenges to Peter Kemp's Ethics of the Irreplaceable". *Eco-ethica*, 2021.
- Serres, M., *Le contrat naturel*, Paris, François Bourin, 1990.

(2002), Tirana Biennale (2003), Moscow Biennale (2011), Istanbul Biennial (2013), Berlin Biennale (2014), Venice Biennale (2015)... Olga Kisseleva works are a part of the 25 most important museum collections, like Centre Pompidou (Paris, France), Louis Vuitton Foundation (Paris, France), ZKM (Karlsruhe, Germany) Moscow Museum of Modern Art (Moscow, Russia), National Center For Contemporary Art (Moscow, Russia), MOMA (New York, USA).

Anton Orel was born in 1981 in Ukraine into a family of engineers. Has 3 high degrees in IT, philology, and psychology. He is a doctoral student now at the Sorbonne University (Paris, France). Studies the issue of biomorphic urbanism and the arts. Works in the IT field.

Authors Biographyes

Olga Kisseleva is an internationally renowned artist. Her main exhibitions include: the Modern Art Museum (Paris, France), KIASMA (Helsinki, Finland), Museo Nacional Centro de Arte Reina Sofia (Madrid, Spain) La Fondation Cartier for contemporary art (Paris, France), Centre Georges Pompidou (Paris, France), Guggenheim Museum (Bilbao, Spain), Art Institute (Chicago, USA), National Centre for Contemporary Art (Moscow), Louvre Museum (Paris), as well as Dakar Biennale