Sense of Nature*

Seismic Garment

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ABSTRACT

People live in their homes, walk in the streets, and take buses, subways and trains, ignoring that the Earth is alive under our feet. Yet, the Earth also moves, evolves, transforms, and quakes.

Sense of Nature is a project that addresses the reflection of living nature by creating new meaning through the Earth's activity and reflecting through wearable technologies to connect people with the Earth's seismic activity, making a new sense.

Through IoT technologies and the development of a smart garment, the project collaboration intends a contemporary concept, creating a novel functionality and aesthetics that embraces the ecosystem of bio-inspired design through soft robotics (Danese, 2015). This project aims to bring humans closer to the perception of vibrant nature through technologies such as soft robotics, computational couture and data-driven performance that provide this link to the Earth.

CCS CONCEPTS

• Interaction design • Collaborative and social computing • Ubiquitous and mobile computing • Visualization

KEYWORDS

Cyborgnism, Soft Robotics, more-than-human design, Provocative, Speculative and Participatory design

INTRODUCTION

How is it possible that we have ignored he Earth is alive under our feet movement for so long? How little do we know about the deepest movement that exists? Earthquakes are like the planet's breathing or the beating of its heart, moving at its own pace, never stopping. Data and technology can connect us to an accurate picture of the Earth, to the heartbeat of our planet.

1.1 How it started

The project's starting point is based on the research that the artist and cyborg choreographer Moon Ribas(*Moon Ribas | Cyborg Arts*, no date) has been developing. For almost seven years, she has embedded implants in her feet that were connected to online seismographs that allowed her to perceive the planet's seismic activity through the vibrations of her body in real-time. This new contribution she named: Seismic Sense.

Figure 1: Performance and recording test of Moon Ribas countryside.

To share this new information, Moon has created performances such as Waiting for Earthquakes or Seismic Percussion, in which the Earth becomes the choreographer and composer of the pieces, and she becomes the channel and the interpreter.

Figure 2 & 3: MesaCyborg ColetivoAM , Performance Sismograf Festival 2017.

Through this initiative, we remind ourselves of the great urgency to comprehend the principles of nature, and that humanity is only a part of its ecosystem. As human beings, we must honour it, respect it and contribute to its sustainable evolution.

1.2 How it Works

In seismic Garment, the data is transformed into a piece of interaction. The transformation of the seismic data into the movement of the Garment enables interpretation and dialogue with the artist and the audience. Furthermore, it is connected to our planet's most profound movement known in the history of nature, the activity of the Earth. The data collected and expressed into the electronic wearable enables the Moon and the audience to feel how alive our planet is by the movement of the tectonic plates. Earthquake is probably the most primitive movement, a massive movement that the Earth makes continuously but most of the time imperceptible.

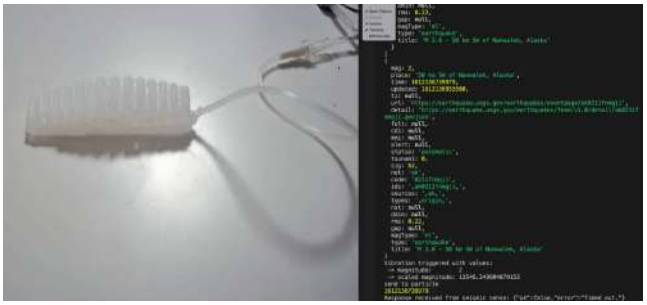

Figure 4: Testing data receiving and actuation soft robotic.

The Seismic Garment involves creating a garment made of soft robotics that reacts to the data generated by the scales of the movements coming from the seismological bases close to the device. This data is transformed into the impulse that controls soft robotics. This data is transmitted via Wifi to the system embedded in the dress. When the seismic event is stronger, the soft robotics is inflated at a more intense level when the event occurs. Thus the performer can perceive the intensity and frequency of the activity in real-time while engaging the audience visually, creating a dialogue and exploration of the movement even when the soft robotic is deflating. The following picture illustrates the process of transferring data from the simulation to the prototyping

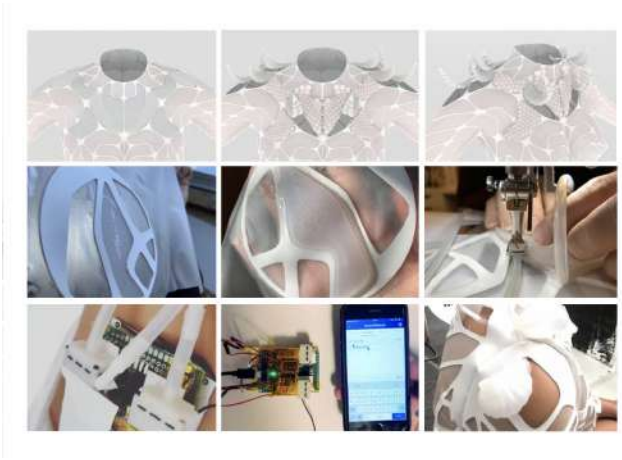

Figure 5: Prototyping Sense of Nature.

DISCUSSION

This initiative has interconnected with the public and cross-sectionality of performance and cybernetics media fields. Cybernetic, mainly, is involved in the project and refers to the particular attention paid to the inputs of our environment to learn from them. In this sense, it is a co-creation with the data of nature, the artist being the interpreter. Thus the seismic garment project aims to share the seismic sense with the public. If we have a deeper understanding of how our world works, we can empathise more with it.

Here it is also intended to include a broader community to comprehend and engage in the explorative and participatory process of further learning about the phenomena of nature.

This community, initiated by Moon Ribas and in conjunction with the cyborg foundation, began to reexamine the idea of communication and interaction with the earth at an artistic level, where today, technology is a vehicle to engage the community and express in different ways the urgency of changes in nature and the empathy and belonging to our ecosystem. Hence the call to geologists, ecologists, media artists, artists, makers and manufacturers to enhance the experience and understanding of this phenomenon.
This project reaching out to an audience of artists, also aims to democratise immersive technology to empower artists and the audience to be part of the piece and thus fulfil the ultimate goal of generating a sense of appreciation and belonging to mother earth.

2 Opportunities to develop further narratives

This research will pursue the development of the project in terms of improving the following:

- Co-creation of an immersive experience
- The replicability and connectivity
- Sustainability between tradition and digitization of
- The prototype Opportunities to develop further conversations and ultimately the role of technology in promoting a stronger connection between humans and the natural world

Here, we introduce some aspects that can bring this research in a intersectional pivot to explore care and awareness about the environment.refering the roll of care and mor tha human design.

Immersive Experience Data - Phenomenon - technology For the co-creation and ideation of a more immersive experience with other disciplines to understand how to adapt the expertise between concepts, phenomena and perception. Here is an open invitation for co-creation to invite more scientists, such as geologists, geophysicists, astronomers, ecologists and creatives, to talk about these experiences to understand a broader picture of the earth's activity and to reinterpret the performance of the sense of nature and ultimately together define a call for action and empathy around the earth's movement and changes

The replicability: The wearable device's replicability and adaptability are fundamental to testing the device and improving it to be replicated. Technological-wise, the hardware needs to prove and overcome the challenges of the local and distributive community (more artists, more audience wearing the piece of Garment), collaborative and distributive performance.
Understanding the use of data and the system's fidelity in making the collaborative, embedding system to data transmission.

Sustainability: In the tradition of making Fashion couture in this sense, we want to democratise the use of the Seismic Garment for a broader audience. Therefore, this funding could support further developing of a sustainable wearable with good functionality and overcoming the challenges through more durable and sustainable materials.

Digitalisation: a digital component enables the conversation to sustainability digitalisation and aesthetics; due from the project's beginning, we have made a computational couture design that allows the modification and individualisation of the Garment. Furthermore, we want an adaptive wearable that enables the use of traditional and digital techniques, for example, 3D printing, for the elaboration of more stable soft robotics or the integration of the whole system in one piece.

AUTHORS

Moon Ribas: has been experimenting with the union between technology and her body to explore the boundaries of perception and to experience movement in a deeper way. One of the most significant pieces is Waiting for Earthquakes: Waiting for Earthquakes, a durational dance piece based on the interaction between the movement of the earth and Moon Ribas. Moon has a sensor attached to her feet that allows her to feel earthquakes in real-time from anywhere on the planet. During the piece, Moon waits for an earthquake to take place, and when this happens, she moves according to the intensity of the earthquake, so if there are no earthquakes during the time of the performance, there will be no dance. The piece is a duet, where the planet dictates the tempo and the intensity, and Moon interprets it. Earth is the choreographer of the piece.

Adriana Cabrera: has taken this project from concept to prototype in conjunction with the exchange of ideas in collaboration with de Moon and Montserrat. Adriana developed the dress in Dusseldorf 1) looking for flexible materials for performance, 2) interpreting computational design to prototyping and adapting fashion couture, 3) developing the soft robotics and hardware and IoT connectivity.
Adriana is an Industrial Designer, and her work stays at the intersection of engineering technology and art research. Her

work involves digital fabrication, textiles, and wearability in manufacturing. Adriana is an Instructor of the Academany by the FabFoundation and co-leads the fabcare.network. As an innovation manager of shemakes.eu and senior consultant in creative Labs and Hubs at matrix Gruppe she works in diversity and the resonance and impact of technologies in society. She is also a guest researcher for FabLab Kamp-Lintfort at the Rhine–Waal University of Applied Sciences and a global lecturer in Soft Robotics Textile and Technology Academy FabFoundation. She completed the MFA in Media Arts and Design at Bauhaus University Weimar and later an MA in Surface and Textile Design at the Weißensee Academy of Art Berlin, focusing on materials research. Her research aims to expand the opportunities for prototyping soft robotics with a positive impact on its ecosystem and accessible contexts such as FabLabs. Furthermore, she implements in her practices bio-inspired design and explores alternatives in responsible-use materials oriented towards ecological and care transition innovation.

Montserrat Ciges: as a tech artist, she had been developing research projects based on the biomimicry concept creating interactive wearables that reacts to external inputs, imitating animals that are capable of voluntary transformation. In her Bodymimicry project has been able to express this concept in a soft garment carried out through computer design and digital fabrication, using the soft robotics technique to be able to self-transform humans externally, using the garment as a second skin that reacts voluntarily with inputs as a form which generates an interaction between the user and the environment as a non-verbal body expression.

ACKNOWLEDGES AND RESOURCES

VIDEO PERFORMANCE: https://youtu.be/IimO40mgV9A
PROCESS: http://www.acart.design/senseofnature.html

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