Animachines: From nature to technology

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ABSTRACT

Animachines is a new way to look for the species that share the planet with us. In this project, we propose to associate knowledge about ecology, behavior, and morphology of an animal species and integrate it with technology, by co-creating a machine that has the same attributes and characteristics of the animal species chosen by the participating. So, with Animachines we want to reconnect the people with nature, more than that we want to show how incredible is any living form of life, from a cockroach to an elephant.

Tools, Skills and Materials

• Tools→3D Printer • Software→Tinkercad • Skills→Research, Cocreation, Empathy, 3D Modeling • Materials→Cardboard, 3D Filament

Keywords

Environmental education, 3D modeling, co-creation, 21st-century skills, animal species, machines, nature

2. DEMO DESCRIPTION

2.1 Description of the Product/Project

Nowadays we are living in a new manufacturing revolution, the digital fabrication, where atoms, information, bits, genetic codes, amateur networks, and experimentation-thirsty experts mingle to give way to their imagination by building almost anything through manufacturing tools digital. This phenomenon is called the fourth industrial revolution.

Digital manufacturing tools are becoming more and more accessible to everyday people. With the price of a medium smartphone, one can buy a 3D printer. It is also possible to go in any free digital manufacturing lab and use these tools to convert ideas into physical products. A new form of production that is still in the training phase and which can compete with traditional production models is becoming more potent. With this new revolution, comes an arising demand, the need to empower people to use these tools in an entertaining way and offer co-creation tools to boost their creativity.

Do it yourself (DIY) is a movement of personal autonomy that aims to empower people and the creative and constructive processes in the most varied themes and with different types of product. It aims its own production, often homemade, as a way to escape or to offer modified versions of objects that are or are not in the market. When individuals come together to do something with a common goal, DIY becomes DIT - Do It Together.

At the same pace, we live in a highly technological and connected world, distancing ourselves and losing contact with our ancestral origins. Our contact with nature is increasingly scarce, our new environment is the cities and we speak through the bytes and programming codes.

In order to resume this contact and reestablish bridges with our evolutionary origin, we propose the Animachines as a playful way to appreciate the beauty of life that surrounds us and to understand the importance and function of each living creature and structure of our planet. To achieve this goal, the participants will have to perform a basic research on the species on which they will be based to build a machine: What attributes do these species have? What do they do? What structures are important for them? How does it relate to the world that it lives? How did it evolve to get to that design? And an important question that is often made, what would happen if these species disappear?

Together with knowledge in animal species, the participants in groups of three to five people and live a co-creation experience in order to create their animachine. Basically, they do all the research about the chosen species and then model the animachine in Tinkercad, to the 3D printing of their product.

Besides all the research and co-creation process, the fun part also is that there are many ways to choosing your species, for example, we can consider the personal interests of the group in a particular animal and let them choose it. We can randomly distribute cards with species and machines, and the group has to build their animachine with the cards that they receive (e.g. a group received an ant species card

with some attributes and a helicopter card, so they have to build an animachine that merge attributes of both cards). We can create only Animachines based in insects, there are many ways and each one of them brings a different challenge.

For FabLearn experience, we are bringing Animachines with already pre-made cards, we`ll create a diverse deck of animal species along with various machines, from bikes to spaceships. The participants we'll be divided into groups of five people and co-create an animachine with the cards they received.

2.2 Target Audience

Animachines has a wide range audience, basically, anyone with the ability to operate a computer and software for drawing and presenting ideas (Paint, Corel, PPT), a little experience with 3D modeling would be good, but 3D printing and modeling skills is one of our educational goals. For Animachines happen it's necessaire a room with at least one computer for the group, 3D printers and a space to build a prototype. We expect to receive anyone who is curious to know about nature and their beautiful process.

3. CONCLUSION

3.1 Lessons Learned

Animachines is a newborn project, it is still a youngling but with a lot of potential in it. Create it took a lot of research and especially interdisciplinarity with animal biology, disentangling in an incredible experience for us who created and for those who participate. Besides this experience with natural sciences, Animachines helped us to disinvolve 3D modeling skills and creation process, it also made us adapt to different audiences that participate in the project, considering each different experience that can help us to improve and make a better educational experience.

We have a lot to improve in Animachines experience, probably in FabLearn we'll already present a better-stablished visual identity, also creates different storytellings for different experiences and a little bit more of gamification. Also, add other techniques to the creation process, like laser cutting and Arduino machinery.

3.2 Broader Value

This project is proving to be a terrific experience, in each experience or prototype that we made we have new ideas and learn to look in a different way for the animal species that we worked on. It also helps us to understand the Nature functioning, since is clear the functional relation each species has with the World, every single one of them is necessaire and the machines that attributes can provide are incredible and that is the message we want to share with the maker community. Also, each experience is a different one and the participants must be active, they usually have a lot to contribute to the process, it`s a mutual learning and discovering in each animachine created.

3.3 Relevance to Theme

In a fast-paced changing world that we live, nature has suffered the consequences, Animachines could bring a light into this topic and alert about our changing environment.

4. REQUIREMENTS

There are no special requirements.

5. BIOS

Fernando Puertas - Biologist, Master in Ecology and educator for ten years, has interest for non formal spaces of education, innovation and technologies. Nowadays works as an creativity educator in Area 21 Project in Ana Rosa Social Institute in São Paulo, Brazil. Fernando will present the project in poster session.

Edison Cabeza - Product Designer and Master in Design. Has interests in: culture creator, DIY, Open Design, free design, innovation, codesign and digital manufacturing. Activist for autonomous fabrication, design for everyone, maker culture and free design. Is a creativity educator in Area 21 Project,, training young people in 21st century skills, creativity, creative culture and digital manufacturing technologies.

Eduardo Lobo - creative educator, innovation consultant and producer of artistic experiences. Graduated in Design from the State University of Pará - UEPA and Post Graduate in Strategic Design by the European Institute of Design - IED São Paulo.

Images 1 and 2. On the left (Image 1), a Bettle-car, strong, not very fast, capable of riding underground. On the right (Image 2) a Capybara-car, capable of riding on the water and breaking any obstacles with his front teeth.