HOME: a look inside this algorithmic world

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Abstract

The piece “HOME” is a video art installation, where materiality is questioned and where the real and the virtual are confronted, opening windows to a completely abstract and digital world.

Generated by an artificial life system, this piece communicates with the spectator in two ways: one abstract and another actual (concrete). Each one shows one side of this algorithmic world.

Outside of the installation room there is a screen, on which an artificial life system is shown to the visitor in its more abstract form; the individuals have shapes that transmit the mathematics and “dehumanization” inherent to such world through a graphic representation. Inside the installation there are three screens that represent the “construction” of that same world.

1. Introduction

HOME is an artificial life system that presents itself in two different ways: inside and outside the installation room. In each side we are confronted with two different realities of the same individuals, space and their relationship. HOME is at the same time in the social reality world and in the fictional one [1]. The confrontations of such different perspectives aim at making us rethink our bodies, our minds and our spaces [2] through the analysis of our perceptions of what surrounds us in that room.

2. Outside the installation room

Outside of the installation room there is a screen; on it an artificial life system is shown to the visitor in its more abstract form; the individuals have shapes that transmit the mathematics and "dehumanization" inherent to such world through a graphic representation. Is a community built by computers and represented by graphics.

Fig. 1. Information shown outside the

In the graphical representation that is presented outside of the installation room some information is presented in a very direct way to the visitor. There are only three facts available in this representation. Since this world lives on its own duality, this information can be related to any kind of world. Shown are the number of individuals/population; the number of years they exist and the amount of resources available. The lack of specificity doesn't allow the visitors to develop a preconceived view or understanding of this world but at the same time it reveals itself as abstract and machine-based.

Despite that the information given before the visitor's dive into HOME is restricted, and doesn't present the effort of this world to transgress his own "virtuality"[3], even though those characteristics are always present, at least outside the installation room.

This type of representation is normally more associated with this kind of machine-based individuals. Based on the computer system this world is very mathematical and algorithmic. This information is important to establish its "natural" form, making it possible to relate the different states inside and outside the installation room.

3. Inside the installation room

On the other side, inside the installation there are three screens that represent the "construction" of that same world. This system provides its own actions and it modifies itself along time by means of parameters set by the algorithm. During the time that such assembly of individuals exists, they feed themselves, reproduce

themselves, die and so on. The result of those actions is assessed and creates a set of parameters, which selects at each minute an assembly of three videos from a database. Triggered in a synchronized way and displayed on each of the installation walls (screens), such assembly of videos represents the “status” of the world. The sequence of those choices results in the presentation of the “landscape” of that world.

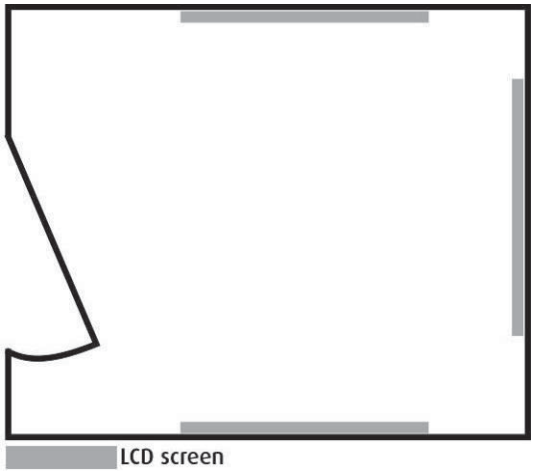

Fig. 2. Space of the installation

The layout of those projections is aimed at producing in the visitor the sensation that he/she/it is looking through windows. The videos are composed of characters that interact with each other in a wide white immenseness and that move along the various projections. The videos give the visitors access to this “world”. The white immenseness baffles the visitor taking and hinders him to perceive the extension of that world. The characters “humanize" themselves losing slowly and progressively the virtual and abstract appearance they present on the screens outside the installation. It is a community that lives “on the other side”.

In this installation the videos are an essential part of the construction of the identity of this society/world. These videos have very special characteristics as they are the way such community communicates itself with us, the spectators. It is where the community reveals itself and transcends the virtual.

The white immenseness of the videos (which in technical terms means that the filming was done in Cyclorama [4]) is an aesthetic normally related to Sci-Fi movies, where the absence of spatial references and where the minimalist aspect of that environment is valued. The Cyclorama offers in this piece, videos that at the same time seem naked and that in turn suggest the existence of a technological society that spreads over an almost infinite space. The absence of parameters is aimed at ensuring that all the attention of the visitors be directed to the gestures of the characters. With this technique, the lack of references makes it impossible to have the full comprehension of the relations between characters and the real size of everything that is shown. In a totally amorphous space we have the possibility of building whatever we wish. The world built by means of actions. A Plantation exists

solely when an individual makes movements that are in some way referred to a plantation space.

Another important aspect is that the main objective of this installation is to enhance the attitudes of the characters, that is, to build a digital society, that expresses itself by means of the videos, and that communicates by means of actions. In this case the white immenseness is a way to emphasize the actions of characters without showing other distractions to the spectators. As the objective is to create in the spectator the sensation that he/she sees the community through glass windows, synchronization of the screens is important. That is, the presented videos in each screen will have two other videos, which will be simultaneously being presented in the other two screens. The objective is to create a liaison among them, which makes the idea of a construction of a world beyond the walls feasible. That liaison is going to happen mainly through the movement of characters from one glass window to another. The result is the construction of a sensation of wrapping the spectator with the "digital world".

Fig. 3. One possible landscape of HOME. Community status is

We can say that in spite of these videos being the representation of the “world”, for the spectator, they are the summit of choices that result in one controlled representation of certain characteristics and that implicate a manipulation on the vision offered to the spectator. The glass windows have the function to create the illusion of clarity and transparency that are not real.

The fixed camera reinforces even further that feeling. In this project, the user does not travel or walk in the space. Restricted information is supplied to him/her. Depending on the status of the inhabitants of HOME, the video is restricted information. Depending on the HOME state the videos may become solely the white

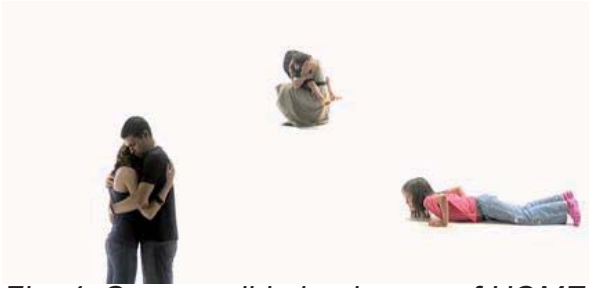

Fig. 4. One possible landscape of HOME. Community status is negative

immenseness.

3. The algorithm

This artificial life system was developed taking into consideration the duality of this worlds and their populations. For that reason, all phenotype and genotype aspects were carefully chosen. These world variables are intrinsically related with important human characteristics such as happiness and at the same time stress the artificial and machine-based orientation of this population.

An initial population of ten individuals inhabits this world. Each one of them has a small genome that is composed of four numbers. The first one is the gender, the second one the third are the life expectancy and the third and the forth numbers are the time interval between their need to use resources.

The gender can be zero or one. Like humans there are only two gender and they can only reproduce with another individual of the opposite gender. I chose zero and one to represent their genders, because I wanted to stress that they are computer-based individuals. Since the computer is based on a binary system, so did the gender of the population. But the reproduction has another important requirement. The population can't reproduce at anytime. Individuals can seek for a reproduction partner at certain times of their lives. Like I mentioned before, they all have a time they are expected to live. They can only look for a partner if they are at the 1/8, ¼, ½, or 3/4 landmarks of their life expectancy. The last restriction to this individuals reproduction is related to their position. Their "physical" position in this virtual and artificial word is given by their position on the memory array. Each individual will look from time to time to their closest array positions (n-1 and n+1) and ask if they are from the opposite gender. If they are they reproduce trough one-point crossover; if the position is empty or its occupied by an individual of the same gender, nothing happens until is time to look again. The empty positions are getting refilled when new individuals as they are born.

The new individual is the result of a single-point mating. The parent that look for the reproduction partner gives the life expectancy and the other mate gives the time interval between the resource use. The gender is given randomly.

The life expectancy is a number of time intervals each individual is supposed to live. Sometimes they don't live all the time they were expected because of the absence of resources available to all the population. In this artificial system the fitness is given by the frequency the individual needs to use resources from the world. In times of crisis, the ones that need resources more often end up dying proportionally sooner. Since their reproduction rate is related to their lifetime, in times of crisis the ones less adapted die first and propagate less their characteristics.

The world is constituted of the population and the environment. The space is an infinity and possibility of creating resources within it is given by the fixed amount of resources that the world always produces plus the amounts each individual can

produce. Every single being of HOME can generate a fixed amount of resources distributed among all of them. The world gives some too. Adding these two amounts one reaches the result of how much of the resources they can spend during the whole year. All the resources that weren't used are saved and can be used in periods of time that the resources are not enough to safely cover the needs of the population. Sometimes the population needs more resources than the ones produced, and that's when the individuals with better capacity of adaptation can survive. The others end up dying before the balance is established again. There isn't a maximum population value. If the population is so small that can lead to the extinction of HOME, the procreation intervals become two times smaller.

3. Videos

In this piece the videos are an essential part of the construction of this world's identity. The aesthetic chosen for the videos was a minimal white space. This concept of space relates to some important Sci-fi movies; one of inspirations was George Lucas's THX 1138 [5]. To achieve such result all the videos were filmed in a television studio where the white surface was illuminated with a special lighting technique [6] that overexpose the white areas. The Cyclorama is a white surface with no hard edges that when used with a special lighting technique erases all the surface flaws and transforms the space into a non-horizon space. The white seams to extend to infinity.

For this project it was important to relate these virtual aspects to the human aspects. The virtual individuals were constructed in this mechanical and artificial way but at same time they are presented as humans. They have all physical aspects we understand as human: one mouth, two eyes, one nose, two arms, and so on, but they are not. They are something else. The environment is amorphous. It is nothing and at the same time everything, what makes them look something like that.

The actor's ages and genders chosen to play the parts in each one-minute video varied. Kids, adolescents, young adults and older adults played during each minute a various numbers of roles that relate us humans to different moments of our existence.

The general feeling of the video was given by the ambient sound. That atmosphere communicates the general felling of the world: positive, negative or migrating from one to another. The actions of the individuals refer to more specific HOME data.

The rate of reproduction, the amount of resources, the population number, the age of the population, etc are the choosing engine for which videos are going to be selected in a more specific way. If the population is big, there are a lot of resources, they are procreating a lot, the resulting video choice is going to be videos with a lot of characters, from different ages acting happily, with construction and planting food scenes. If the population is small old but there are a lot of resources the resulting videos should show images with few older characters acting productively in a

peaceful environment. In times of crisis shall see the characters fighting, the dead being left in the middle of the scene, unhappy and scared characters, etc.

One important aspect to take in consideration is that HOME's landscape is the result of the assembly of the three screens. For such reason the combination of all videos produce an enormous amount of possible landscapes. So, even when the world is very balanced we never end up repeatedly seeing the same images. The same data can produce a lot of different outputs while always transmitting the same message.

3. Sound Design

For clear comprehension of the actions performed by the characters, it is necessary to define something that establishes that relationship between the action and the totally white background. The sound is essential for that to happen. The selection and the edition of references sound transformed and inserted in the videos allow the gestures to transform into actions. The sound is also a way to emphasize the wrapping of that "world" around the spectator as each screen emits its own sound resulting in a surround effect.

The first relation that the sound establishes is the general situation of the world [7]. The ambient sound of the installation can present to the spectator three different situations of the global state of HOME: (a) positive (b) negative and (c) migrating from one state to another. When the status of HOME is good the ambient sound is peaceful and happy. Birds sing, calming water flows and some cheerful kids can be heard. When the world is unstable and the resources are getting scarce, the sound is dark and scary. Rain and thunderstorm anticipates the difficult future of HOME. The mixture of both scenarios represents transition between the previous two states.

The sound design was also important to enrich the video. The sound capture while doing the filming did not represent the real sound of the activities that were being done. There wasn't any of shoving or digging the earth if in the scenario there wasn't a shovel nor soil. The actors movements needed the sound design to establish that relation.

Using Pro Tools, were selected a diverse collection of sounds that transformed this empty white space into hundreds of new scenarios.

The sound is also a very important thing for the wrapping of the spectator, emphasizing the idea of being completely surrounded by HOME.

3. Setup

The setup of HOME is very important to achieve the immersive environment. The space is a small (3x3 meters) empty room with three windows. Each window is made

of 40” LCD screens that are placed about 1,5 meter from the floor on three walls opposite to the entrance door.

Outside the installation there is another LCD monitor. Smaller then the others (only 17”) this one is on top of a table next to the entrance of the room. Under that table is the computer that controls the whole installation. A specially made computer was developed for this work that allows us to have four DVI outputs instead of the standard two outputs. This computer is connected to all the screens of this installation.

The space needs to be neutral so that this disposition can really look like a room with windows to HOME’s landscape.

3. Conclusion

Although since the 1990’s [8] until nowadays many artists already use artificial life systems to produce artistic pieces, most of them push those “worlds” away, keeping them virtual. Even with the use of interaction [9] [10] they still maintain a barrier that reminds the user of the separation of these two worlds.

HOME is a different piece because it explores the union of the artificial and the humans, projecting our own understanding of the body to confront and analyze the construction of a world that is “in between”. The main goal is to destroy the referred barriers, and trough the glasses of the windows, inside the room, establish a communication and explore your own understanding of our bodies.

Even though interactive installations permit a close relationship between user and piece, I hope to create this connection through a different channel. Contemplation may allow the users to immerse through the questions generated by its analyses.

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