

The Server Farm:

An Exploration of Objects as Figures in Narratives and As Tools for Narrative Creation

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The Server Farm

Paint the image of a tactile, breathing, shifting, organic technology. Servers and computational devices which are not limited by the physical confinement of steel, of a finite amount of gigabytes in memory, but are able to shift and mold according to the data they store. Tendrils and flagella extend from each device, coiling in accordance to the information pulsing through them. Intricate roots like mycorrhizae line the floors of the Server Farm, connecting individual units together so that communication between them is constant, their collective knowledge distributed universally.

This Server Farm, a major information processing center is located in a remote location, inaccessible to most, the sensitive information that is stored and processed in its plasmodial bodies hidden safely from hostile actors. These units within the Server Farm communicate with many smaller units distributed across cities, forests and interstates. These units are integrated within the cement of buildings, or appear as outgrowths on a tree branch. Yet regardless of their medium, they are constantly collecting visual, auditory and tactile information and sending it to large, centralized server farms to be processed. This outside information is collected and released as spores, coating surfaces, being absorbed by pulsing membranes and integrated into the continuous stream of data collection.

Picture the Protagonist furtively entering the Server Farm. She knows that she is prohibited from entering the facilities during these hours, yet she must access the coveted data that these units store. She coils her finger around one of the tendrils, the other flagellic extensions on the device latch onto her skin. Electric pulses communicate that this particular dataset was collected about ten years ago, surveying a park ten miles away from the server farm. She feels as if she is in the park at that particular moment in time. The server releases small, electric spores that coat her skin and she feels the warmth of the high afternoon sun. She has a vague memory of being in this location years ago. She has access to every data point of her brief gestation in this location from that afternoon. She retraces her journey across the meandering paths. The tendrils send electric pulses that mimic the feeling of her running her fingers through her dog's fur. Ten years later and she can experience that pleasant, leisurely afternoon as if that moment were occurring right now.

Introduction

Variations on this narrative have been germinating in my head since 2015 and have manifested itself in a variety of media, including in the form of web-based interactive narratives and a visual novel-style video game. Although these media do provide a rich narrative format for exploring this story, they lack the physicality that is needed to bring these organic server objects in the Server Farm to life. Therefore, one of my ambitions is to create an interactive experience that will allow users to experience the tactility, the activation of all of the senses, and the voyeuristic experience of interacting with these objects similar to that of the protagonist described above. In order to do this, I chose to create a physical version of one of the servers from the server farm described above.

In this paper I will discuss the decisions and influences that went into creating a preliminary prototype of one of these server objects, the design interactions that I wanted to focus on and also the shortcomings of this prototype and how I would like to advance this project in the future.

Influences

At the start of this endeavour, the design of my server prototype was largely influenced by objects that had a narrative crafted into their form or that allowed a narrative to emerge through interaction. Sputniko!'s Moonwalk Machine (Ref. 2, Ozaki) is a narrative object which exists in multiple media formats. Sputniko! designed a speculative moon rover, which left footprints from a pair of high-heeled shoes on the moon. These high-heeled imprints were meant to indicate that they had been left by a female person, and were meant to symbolize a woman placing her own imprint on the moon even though as of yet, no woman has walked on the moon. In addition to creating this object, Sputniko! created a music video (Ref. 1, Ozaki) which displayed this object within the context of a story. A girl who is obsessed with a fictional warrior heroine from the moon creates the rover-like object in order to become closer to her hero. She creates a stage set with moon rocks and films the rover leaving tracks in the sand. By leaving her footprints on the moon, she becomes closer to her heroine. The rover object represents a female presence on the moon while at the same time existing as an object in a narrative of love and desire, while still being used to create a narrative of actualizing the impossible love between the girl and her heroine.

I was also inspired by the aesthetics of pinball machines and elements of Eastern Orthodox churches where carefully positioned imagery creates a narrative meant to be interpreted by an audience. Figure 1 features an image of a pinball machine from the movie, *Alien*. Scenes from the film are depicted through images and three dimensional figures, providing a visual synopsis of the film's main characters and events. Those familiar with the film are aware of the significance behind the images. Playing a game of pinball creates a narrative of victory or defeat. The figures take on an additional meaning as the game progresses, acting as obstacles to victory. A game of pinball becomes an attempt to defeat the Alien. Similarly, in Eastern Orthodox churches, the placement of imagery within the architectural space is endowed with a

significance regarding the relationships between the icons. Those familiar with the religious context will know the particular biblical scenes which are depicted and the role of the characters involved. The presence of the imagery reinforces religious values while allowing parishioners to contemplate the meaning of each scene and their relationship with God. Therefore, multiple narratives are being formed including the ones displayed on the walls, the parishioner's interpretation of the imagery, and parishioner's own interpretation of their connection to God.

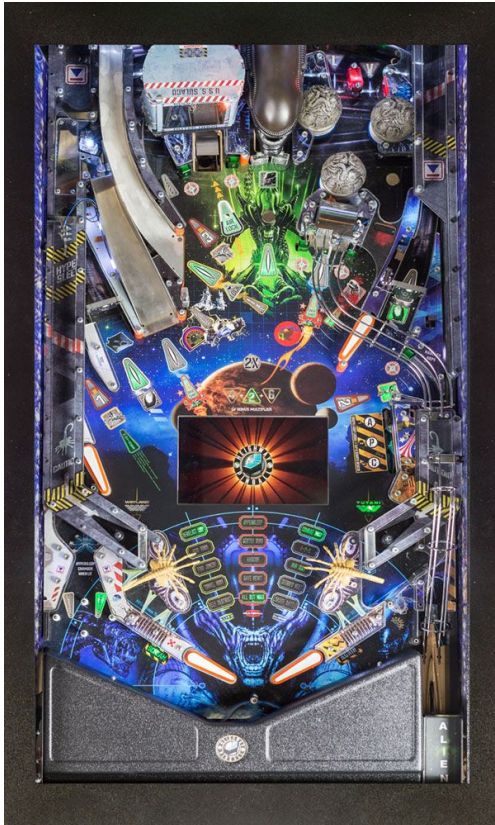


Fig 1. An image of a pinball machine depicting scenes from the movie Alien.



Fig. 2 Imagery depicted on the walls of an Eastern Orthodox church.

The concept of an object that could be used as a tool to create narratives while also functioning as a part of a narrative itself greatly influenced how I approached the use and functionality of the server object. I wanted the form of the server object to represent a narrative, while interaction with the object would reveal further narratives.

Narrative Embedded in the Form

Although I had been fostering the notion of these servers as living, organic objects for a while, my understanding of their organic nature was largely aesthetic and I had not yet fully defined their underlying functionality. How could one of these server objects instantaneously transfer information and sensations to a character so that they were felt in their skin and in their consciousness?



Figure 3. An early concept sketch for the visual aesthetic of the server objects.

David Parisi's "Archaeologies of Touch" provided a framework for answering this question. Parisi examines how the act of touching electricity was integral to the development and user experience of early electrical machines.

Parisi explains that these

" . . . complex machines also constituted a type of tactile media, providing standardized and carefully calibrated electrotactile experiences while also giving a corporeal grounding to the notion that electricity flowed through bodies as it did through telegraph networks. The currents communicated by electrotherapeutic apparatuses contained veiled messages about electricity's ability to move through nervous networks—messages that touch proved uniquely capable of both receiving and decoding." (Parisi, 45)

Electricity moves through human bodies and the messages contained in its current are mediated and interpreted through touch. Parisi provides another example of electricity moving through a network of human bodies. He describes experiments with the Leyden Jar carried out by Abbé Jean Antoine Nollet.

“By passing the charge between participants, Nollet effectively succeeded in transmitting tactile sensations through the networked bodies, a type of broadcast tactility that prefigured later attempts by twentieth-century haptic interface designers to transmit standardized, machine-generated tactile sensations through electrical networks. Previously communicated only from machine to human, or between individual humans, shock in Nollet’s trials became an experience shared by everyone in the chain.” (Parisi, 56)

Multiple human bodies, or even multiple living, organic objects could serve as conduits for the passage of electricity and messages encoded in electricity. The meaning of the message is felt in the sensation of the electricity against the skin. In addition to this, Parisi describes the results of Italian physicist Alessandro Volta’s experiments of exposing various sensory organs to electricity.

“Volta’s results implied that electricity activated in each organ an energy distinct to it (light in the eyes, taste in the tongue, etc.), as well as a distinctly tactile feeling of impact on the nerves, whether current was applied to the ears, nose, eyes, skin, or tongue. These experiments simultaneously differentiated the sense organs (by identifying them as possessing distinct energies, and through Volta’s decision to inscribe the five-sense model in his experimental process) and dedifferentiated them (by identifying feeling as a common sensation that could be activated in each organ).” (Parisi, 74)

Exposure to electricity had a different effect on each organ and amplified or altered the sensory qualities of each organ. Therefore, electrical messages could be sent to each organ and be interpreted or received differently. When the tendrils of the server object latch onto various parts of the protagonist’s body they transmit information in the form of electricity to the sensory organs and convey a holistic account of the data that was collected.

Although the fictional functionality of the object was steeped in an organic, responsive material, the preliminary prototype would consist of more static components. The current prototype of the server object consists of a two-inch LCD screen connected to an Arduino and two buttons. These items are encased in a laser cut and engraved box-like structure. The use of digital fabrication was largely informed by Tobias Klein’s use of 3D printing and scanning in his creation of *Synthetic Syncretism*. Klein examined local burial culture in Havana, Cuba and the practice of Santería. He picked up vestiges of religious rituals practiced in the Necropolis de Cristobal Colon, including bones from animal sacrifices, and brought them back to London. He then scanned these objects and imported them into 3D modeling software (Klein, 2.1).

Klein states that

"In the technical framework of the project *Synthetic Syncretism* and the debate around digital craftsmanship, the translation from actual biological fragments to a digital data set, is comparable with the creation of a mold for casting in sculpture or taking measurements during the design of a garment. The very fabric of the project stems from the rituals of its cultural background and the translation from the mortal physical remains to the scale-less, ephemeral digital is a significant step. The artwork expresses site specific narratives and simultaneously creates a cultural for 'reading' craftsmanship." (Klein, 2.1)

Data is taken from biological elements, molded and abstracted into a digital form. The data still maintains a connection to its original source and meaning, however its new digital form imbues it with an alternate meaning and interpretation.

In the case of the prototype for my server object, the acrylic casing is engraved with image data. A vectorized version of an organic, cellular structure I drew was engraved on the acrylic casing. This image appears as a motif through many of my illustrative pieces and is present in the conceptual sketches of the server objects. The formal qualities of the image are altered as it is applied to the acrylic surface. The flat lines are provided with depth as they are etched into the transparent plastic, allowing the pattern to build up and gain texture.



Figure 4. The current prototype of the server object.

Narrative Embedded in the Experience

The acrylic casing is used to support an LCD screen and two buttons. One button is used to "send" information, while the other is used to "receive" the information. In this iteration of the prototype, there is no real communication between the buttons. Rather, pressing on one button displays messages on the LCD screen about sending and collecting data, while pressing the other one displays messages about receiving and interpreting data. The Arduino code displays a default message on the LCD screen. Pressing the buttons displays one of three randomly selected messages for sending or receiving data.

The use of interaction and text was informed by Pedro J. S. Vieira de Oliveira's article on sonic fiction and speculative design, "Design at the *Earview*: Decolonizing Speculative Design through Sonic Fiction". Oliveira describes sonic fiction as approaching

“auditory experiences from the bottom up, extracting theories of sound and listening from record sleeves, liner notes, beats, and vibrations as a means to construct an augmented experience of sound.” (Oliveira, 44-45). Therefore, sonic fiction does not solely focus on the sound, but the holistic physicality of materials used to interpret, contain and visualize sound. Oliveira cites Eshun’s practice of sonic fiction, stating that

“[Eshun] . . . highlights the need for an understanding of sound that lies beyond the ear alone, asserting that in order to understand popular music one only needs to look at the records themselves. His sonic fictions are born out of the combination of sleeve notes, album covers, and the music itself, all composing a tale of an estranged future. This future is already there, unevenly distributed into grooves, sleeve paintings, and liner notes’ manifestos—fictional worlds filled with politics, coming into being the moment one grabs the record, continuing in the process of dropping the needle, flipping the piece of vinyl from side A to side B and finally inscribing itself in memory when it is over.”(Oliveira, 46).

According to Eshun, sonic fiction is a means of actualizing futures through music and sound, particularly futures of the African diaspora in the Americas that are free from the effects of European colonialism. The futures provided by this music are already envisioned on the physical materials used to access, contain and visualize the sound. The physical presence of these objects already indicates that the materiality of the world has already been affected by the sound, that a gateway to a possible future has already been opened.

Although my piece is silent, it was influenced by Oliveira’s account of sonic fiction in that it uses the material components surrounding the text on the LCD screen to create a complete narrative. While the text on the screen describes acts of collecting and interpreting data, interrupted by horizontal lines to represent glitching, the plastic casing evokes the organic materials that were used to collect the data in the narrative. The buttons invoke user agency by inviting the user to send and receive data and to participate as a conscious agent in this system of data collection. By interacting with the buttons, the user is already participating in a world where the machine is receptive to their touch.

In addition to user agency, I came to realize that there was an element of maker agency in the creation of this prototype. This idea dawned on after reading about the Galaksija, the first personal computer created in Yugoslavia. The Galaksija was created by Voja Antonić in 1983. Personal computers for most citizens were inaccessible due to a law that forbid imports of items over five hundred US dollars (Packwood). As a result, Antonić chose to create a domestic personal computer inspired by the Sinclair ZX81. The computer has rough 64x48 graphics and printed three, very simple error message, “WHO”, “HOW” and “WHAT”. The diagrams for the computer were published in Galaksija, a magazine by the same name for technology enthusiasts. Over 8,000 users ended up creating their own Galaksija. Because the instructions for assembling the computer were presented as a DIY project, no two Galaksijas looked the same (Packwood).

In a recent video interview (Ref. 4, MINT), Antonić described the conditions that led to the creation of the Galaksija. He provides an anecdote of how he heard a politician say that Yugoslavia didn't need any programmers because he had heard that the Americans would create a self-programming computer very soon. Antonić scoffs at this and then says, "Well, okay, if he were smart, he probably wouldn't be a politician." He then discusses the restrictions imposed by the ban on imports exceeding five hundred US dollars. He says, "Well of course we tried to sneak in computers. That is how it always is. You are forced to the edge between legality and criminality in order to correct for someone else's stupidity." (Ref. 4, MINT). The video interview is conducted entirely in Serbian, therefore these statements made by Antonić have been roughly translated by me.

The creation of the Galaksija was a response to arbitrary restrictions by the government which prevented Yugoslav citizens from technological progress. However, in contrast to rigid design and aesthetic standards and the mass commercialization of computers in the US, the assembly of the Galaksija was left up to individual users. The functionality of the individual computer components was not abstracted by an interface and streamlined product design. Therefore, the users assembling the computer participated as an active agent in the creation of the machine. Similarly, my prototype can be assembled using cheap, easily available materials. The design for the engraving and the arduino code can be easily disseminated through online media.

Conclusion/Expansion

The current prototype of the server object serves as a proof of concept with the bare minimum in terms of form and functionality needed to convey the aesthetics and interactive nature of one of these objects. The prototype manages to function as an object from a narrative while still generating narratives through text on the LCD screen and encouraging users to participate in the sending and receiving of messages by pressing the send and receive buttons. In this sense, I believe that it is successful existing as an object from a narrative and generating narratives like Sputniko!'s Moonwalk Machine.

However, the current implementation does not make the user feel as if their own body is connected to the sending and receiving of data. Although the buttons do allow for some user interaction, the level of effect that the user has on the text and the generation of the narrative is minimal. It is a far cry from the possibilities for tactile and sensory experiences with electricity described by Parisi. Phoenix Perry's game Bot Party (Ref. 3, Perry) provides inspiration for integrating the use of tactility in the transfer of data in my project. In Bot Party, people hold small Bots with metal lining. When multiple people are connected through touch, various sounds are activated. The brutal feeling of electricity on the skin is not felt, yet users are able to pass electric data through one another.

Although I think the current text and visuals on the LCD screen effectively communicate the feeling of interacting with a server object for this version of the iteration, they will have to be

altered for further iterations. Further iterations of this project will experiment with the point of view of the narrative, whether the person interacting with the server objects approaches it as themselves or in the role of a particular character with a specific goal of accessing the data.

The form of the object will change through further iterations as well. I would like to experiment with means of altering the form of the object according to data that is sent and received.

Although, I am still unsure what avenues to take on this front, I am taking my inspiration from kinetic sculptures and the use of motors that are triggered through various inputs in order to alter the form of the server object.

Ultimately, my goal would be to create an object that makes users feel as if they are agents in a narrative where they are interacting with a system which collects visual, audio and other sensory data from many remote locations. Moreover, I would like to them to feel as if this data is passing through their body and how they choose to integrate their body with the machine has direct consequences in the narrative. This prototype served as a preliminary step towards this goal.

View a video of the prototype here: <https://www.youtube.com/watch?v=oe9R97BWq7w>

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Stylistic inspiration for The Server Farm section:

Curtis E.A. Karrow. "Ubiquitous Computing, and Time". *Leonardo* 2000 33:1, pp.1-2., doi:10.1162/002409400552108

Image URLs

Figure 1:

<http://www.homeleisuredirect.com/Assets/HLD/User/22278-Alien-playfield-top-1.jpg>

Figure 2:

http://flipfloppeople.com/img/Orthodox_frescoes_Rila_Monastery.jpg

