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Any One, anyWare: Perceiving Sentience and Embodiment in a Distributed Sculpture

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Abstract

anyWare is an Internet of Things distributed sculpture comprised of three identical objects that are individually connected to the Internet and physically mirror each other. The *anyWare* sculptures are art objects that telematically connect three different locations in the world and enable distal physical communication. The objects simultaneously respond to people who interact directly with them, as well as allow them to interact with each other through the sculptures. Structuring these interactions are a number of games and puzzles that people may play or solve, either individually or collaboratively. The objects transform in the experience of exploration, and in so doing reveal different levels of interactivity and aesthetic experience. The mediated sentience of the *anyWare* sculptures through non-verbal, playful interaction provides a model for envisioning networked communication that circumvents age, cultural, and linguistic differences.

Keywords

Internet of Things, sculpture, distributed interaction, tangible interaction, non-verbal communication, embodiment, game design, object-based enquiry, interactivity, research-creation.

Introduction

The *anyWare* project saw the creation of three identical sculptures designed to telematically connect three different locations in the world. These objects are individually connected to the Internet, and physically mirror each other. The *anyWare* sculptures simultaneously respond to people who interact directly *with* them, and allow people to interact with each other *through* them. To structure these interactions, we developed a number of games and puzzles for people to play or solve. For example, if someone walks into the gallery in Montréal and begins to play and interact with *anyWare*, someone in Toronto at the same time will be able to see the results of those interactions. At this point, the person in Toronto may join the person in Montréal in the game and collaborate with them, which might entice a person in Ottawa to participate. Each identical object enables a set of playful interactions that are designed to encourage experimentation, exploration, and potential ‘conversations’ with other

interactors in different locations. The objects transform in the experience of exploration (either with one person or potentially with many people) and in so doing reveal different levels of interactivity and offer different levels of aesthetic experience.

anyWare explores our emotional and physical connections with technology in a world of ubiquitous computing. Ubiquitous computing refers to the many ways computational systems have moved beyond computers, entering unobtrusively and seamlessly into the world, and embedding themselves within all of the things with which we surround ourselves (Weiser, Greenfield). The field of ubiquitous computing has several areas of focus, the most relevant to *anyWare* being the Internet of Things (IoT). A term coined by Kevin Ashton in 1999, IoT broadly refers to objects connected to the Internet, each uniquely identifiable and capable of providing real time information about the world. This can manifest in many ways, from gas meters connected to the Internet, which are controlled by an iPhone app (GE Brillion™ Connected Appliances) to the global response to the nuclear disaster in Fukushima, when hundreds of DIY geiger counters in Japan were hooked up to the Internet using the public data monitoring service *Pachube.com* (now called *Cosm.com*).

Most pertinent to *anyWare* are projects that focus on tangible user interfaces that have the potential to transform interaction, connect individual lives, and help facilitate communication over distances, for example, Alexandra Deschamps-Sonsino’s *Goodnight Lamps*[1] 2013 and the MIT Tangible Media Group’s *inFORM*[2] 2013. What happens to bodies as they move alongside these technologies and networks, and how can these technologies become tools for emotional exchange? When we live around these objects/systems, it is natural that they become incorporated into our daily lives; we begin to live through them, and more importantly, we also begin to feel through them, both in terms of individual experiences and relationships with others. These objects and systems become an extension of not only our physical selves but also of our emotions; they mediate how we play and interact together (Dourish, Greenfield, Rogers).

Conceptual Framework

In many ways, ubiquitous computing represents a massive paradigm shift in our relationship to objects, computing technology, and each other. Ubiquitous computing also provides us with an opportunity to re-engage issues that have long been a source of significant artistic inquiry. Explorations of technology through art, audience engagement, and interactivity can be traced back to the 1950s and 1960s in performance, Happenings, and the Fluxus movement. During this time, experimental art and technology explorations came out of the Bell Lab's artist-in-residence program, Experiments with Art and Technology (EAT) performances, and works by the Nouvelle Tendance in Europe (Burnham, Salter). Over the last several decades, this experimental culture has continued to thrive, and it can be found within many artistic domains including, but not restricted to, experimental theatre and music, performance-based practices, cybernetics/robotics, and interactive video. This type of work can be found in individual studio-based explorations, larger collaborative artistic projects, as well as aesthetically driven research/creation in spaces like V_2 Labs (Rotterdam, NL), Milieux: Institute for Arts, Culture, and Technology (Montréal, CA), and Centre for Art and Media (ZKM) (Karlsruhe, De).

Telematic interaction has been featured in the artistic imagination since the 60s (e.g., Nam June Paik's proposition for a live concert between San Francisco and Shanghai, where the left-hand part was played in San Francisco and the right-hand part was played in China). Today, cutting edge research in telematics spans the globe. Notable research projects include TOT (Territoires Ouvert – Open Territories)[3] at the Société des arts technologiques (SAT) in Montréal (CA), and the New York City (USA)/ Seoul (KR) performance/musical collaboration at CultureHub[4], situated at La MaMa Theatre and Seoul Korea Institute of the Arts. This work focuses on telematic ocular and aural communication, allowing individuals (dancers and musicians) to collaborate and move in parallel through space and time. Other attempts to explore physical relationships between bodies in different spaces include *Silent Barrage* (2010), a collaborative project by the Neurotica Collective (AU) and the Steve Potter Lab (USA)[5]. This work connects a robotic sculptural installation in China to the cultured nerve cells of a rat in a laboratory in California. The sculptural robotic elements in the physical installation in China were telematically connected to different regions of the cultured nerve cells, and moved according to the neuronal activity of the rat. Conversely, individuals within the installation would respond to the moving robotic components, and their movement in turn stimulated the culture. Most of these projects, while connecting bodies through space, do not facilitate physical or embodied intentional communication between the participants in the different locations. *anyWare* builds on these ideas of distal collaboration and communication, but with a focus on non-verbal and embodied means

of connecting people through space and time in tangible interaction and play.

Artistic inquiry is a powerful methodology for engaging with lived experience and creating spaces for the body that are unstructured, thought provoking, and at times playful. However, to create a work that asks individuals to communicate through networked objects without voice or video, we need to reimagine how interactivity has traditionally been structured within an art context. How do people recognize and interpret feedback and assign meaning, be it through computational feedback, telepresence, or error? Interaction structures drawn from games provides new solutions to manage some of these issues. Games excel in structured interactive experiences, leveraging rules and goals in order to scaffold user interaction in a manner that enables a deep and fluid engagement. By adopting a sophisticated understanding of what games are and what they do, *anyWare* goes beyond simplistic gamification paradigms and instead find engaging new structures for interactive art experiences.

The relationship between gaming and art has become a point of exploration in several recent festivals, exhibitions, and art and technology centres around the world. Most recently, David O'Reilly's videogame *Everything*[6] was awarded a 2017 Golden Nica from Ars Electronica. The EYEBEAM Art and Technology Center has expanded its areas of research to include game design, and major exhibitions and festivals such as F.I.L.E (Brazil)'s FILE GAMES RIO, and the 5000m2 exhibition *Joue le jeu/Play along* (la Gaîté Lyrique, Paris, FR) continue to create productive crossovers between the world of gaming and the world of contemporary art. This area of investigation is not only exciting in terms of the space of discovery it opens up in new media art practices, but it also suggests a range of opportunities for disseminating this type of work.

Project Description

The three *anyWare* sculptures are visually inspired by the cephalopod (octopus, cuttlefish, and squid), marine creatures that communicate through changes in colour and pattern on their skin. Like the cephalopod, the bodies of the sculptures are vessels for communication which enable players to communicate non-verbally. The sculptures are almost exactly the same, and they do the same thing at the same time: the only unique quality is that each object has its own 'location colour'. When a participant touches an interactive surface on the sculpture, the area lights up in the location's colour. There are three sculptures and three location colours: yellow, blue, and pink. If you are at a blue location, and you see a pink or yellow light illuminate, it is possible to recognize the presence of a distributed interactor.

There are three 'art states' and three games that reflect the art states aesthetically, through sound, colour and light (see Figure 2). The art states include the Minimal State, Shadow State and Colour State, and the associated games include Tap, Spin and Follow. To transform the sculptures into a

different art state, one must play/solve the associated game (see Figure 1). The experience is cyclical in nature, with no beginning and no end, and the sculptures can be left in any art state to be viewed and experienced as an art object. Interactors can come and go at any time, leaving the sculptures in any art state until someone else, in any of the locations, decides to engage with the work. The sculptures can be experienced or interacted with alone, with a friend, or with a stranger from another city or even another country.

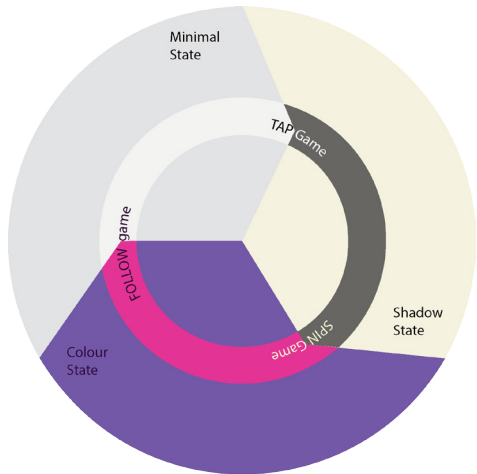


Figure 1. *anyWare* 'art state' flow infographic

As the sculptures use colour, light fluctuations, vibrotactile feedback, and sound cues as primary modes for communication, we provide the viewer/participant with a series of rules with which to guide their communication (see Figure 3). Interactors must learn to interpret colour as presence, vibration as the initiation of touch, and white lights as a call to action. Learning these simple rules allows the interactive experience to begin, and initiates an alternative communication style that does not rely on a common language. *anyWare* encourages people to discover new ways of interacting, and challenges standard voice and screen driven

telematic paradigms. This enables embodied experience to find a place in distal communication, and requires people to



Figure 2. *anyWare* 'art states': Minimal, Shadow and Colour

discover more creative ways of communicating intention, presence, and willingness to engage.

Observations and Reflections

The inaugural exhibition in June 2018 connected three cities in Canada (Montréal, Ottawa and Toronto), which are separated geographically and linguistically (French and English). Through the *anyWare* sculptures individuals in the different locations were tasked with finding non-verbal ways to both communicate and collaborate.

How do we move from a blip to a dialog with another sentient, embodied entity? Encouraging participants to recognize and connect with another human in a remote location was a continual challenge in the iterative design of the sculptures. Initially we had structured a tactile 'handshake' gesture as a point of connection-- a touch-- between interactors at different locations. However, the handshake had mixed success being read as an extension of another human point of contact. What did evoke that shift, that perception of a live interactor, was instead the association of different light and sound cues to distinct locations. Individuals who may

README

- 1) Place your hand on the 'handshake' to communicate your presence. This 'wakes up' your sculpture.
- 2) Each location has its own colour:
 - Montréal is ●
 - Toronto is ●
 - Ottawa is ●
- 3) You can touch the sculpture gently (start by touching the handshake).
- 4) Touch the white lights. They are there to guide you.

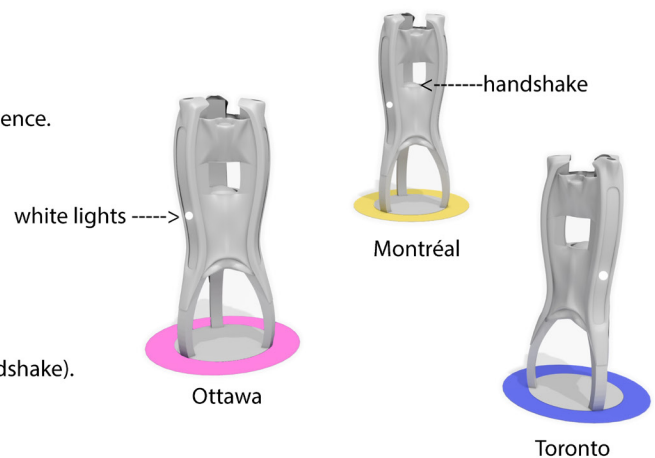


Figure 3. *anyWare* didactic

be observing the sculpture would see these cues, and begin to associate them with the presence of another participant. This was often the prompt that transformed an observer into an interactor, as they jumped in to compete or collaborate with this distant sentient body.

In this way, the *anyWare* sculptures serve as portals that transmit touch: visualized and reinforced by colour, sound and light. The playful interactions embedded in the sculptures are broadly accessible, and have proven to be particularly powerful at bridging public, gaming and art audiences, as well as enabling inter-generational play. Increasingly these audiences have grown socially and emotionally isolated from each other, with technology exacerbating differences rather than enabling connections. *anyWare* is unique in the way that it promotes embodied interaction and collaboration between distributed players despite age, cultural, and linguistic differences, through simultaneous events in three different locations in the world. As the sculptures are

designed to be set up in different countries, cities or spaces within a building, they effectively create the context for people within these locations/communities, to connect and collaborate with each other. In our current divisive social and political climate, connecting spaces and people from different cultural contexts has become extremely important. The mediated sentience of the *anyWare* sculptures through non-verbal, playful interaction provides a model for envisioning networked communication with the potential to once again connect with each other in new and meaningful ways.

Acknowledgements

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