Stop and Care — Changing Behaviours Through Participatory Interaction

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Figure 1: Overview of the artifact in the public space.

ABSTRACT

Stop and Care is part of a project that aims to raise awareness for the urgent matter of water pollution and to change its audience behaviour towards it. The Stop and Care output is a visual composition that represents solid waste floating on water and the amount of pollution in it will depend on its audience. The audience has an active role as the visual environment adapts to their behaviour, representing the impact of the individual care on this subject. By creating a relation between artifact and audience through participatory interaction, we aim to build an experience that goes beyond the moment of the interaction with the artifact and extends to the change of habits of each participant in the future.

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CCS CONCEPTS

• **Human-centered computing ~ Participatory design** • Human-centered computing ~ Gestural input • Human-centered computing ~ Collaborative and social computing • **Applied computing ~ Media arts**

KEYWORDS

Participatory Interaction, Visual Communication, Water Pollution

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1 Introduction

Models that address the use of the body and the physical involvement of an audience to promote social changes goes way before the computer age. Many argue in theory the inclusion of the audience to strengthen the relationship of the viewer with what they are observing — instead of the mere passive interpretation [8]. Josephine Bosma argues that it's in the moment of the participation that the artwork gains meaning [9]. To reinforce the meaning created by the active role of the audience in his projects, Rafael Lozano-Hemmer — an artist who seeks to create relationships through interactive installations — prefers to use the term *Relational* to describe his work. He argues that the term *Interactive* resembles a more *top-down* approach while *Relational* creates a more horizontal relationship between the participants and his installations [4].

The use of computational approaches to address social issues that need awareness broadens the possibilities of creating a relationship between audience and artifact. When a visual communication system adapts its characteristics to its context and especially to the behavior of its audience, it creates more customized, meaningful and engaging experiences, enhancing the reception, impact and memorization of the visual message. This approach is particularly relevant to address the audience of the digital society.

Environmental issues are becoming our daily concerns. We are experiencing the consequences of many years of carelessness towards the negative consequences of our daily habits. The preoccupation has grown as the time to act decreased and some consequences are no longer reversible. There is an important message to spread: "We have to act now!" [13]. From appeals of powerful institutions (e.g., UN [16]), to international movements manifestations (e.g., Extinction Rebellion [1]), or even individual strikes by teenage activists (e.g., Greta Thunberg [3]), we are surrounded by serious calls for a change of attitude that reaches the public through diverse means. All types of media are valuable to spread such an urgent message and visual communication is one of the most effective ones. People relate more to a subject if they have an active role in the discussion, so we should include them when communicating this message visually. Considering this challenge, we address this subject using participatory interaction.

In this project we focus on the problematic of water pollution caused by solid waste. This problem can be caused by a lack of recycling habits, the mass production with non-biodegradable materials, or the increasing throw-away culture [12]. A joint effort is essential but single actions are also crucial [6]. Beginning with the sentence "Stop and Care" we created an artifact that grabs the attention of one viewer at a time. By reacting to his/her behaviour, it aims to make him/her aware of the water pollution problem, the impact of individual concern and the need to care, act and change habits. The message is simple: caring — for the planet, for future generations, for our quality of life — is the first step to act. So we start with that.

2 Stop and Care

Stop and Care is the name of this project, as it aims to raise awareness by making people stop to think and care about the water pollution issue. First we will explain the context of the project within participatory interaction. Then we will discuss its application to the issue we are approaching, how it is represented visually and how it will react to the participant behaviour. Finally, we will present the technical implementation.

2.1 Concept

The introduction of areas such as interactivity and participation in visual communication allowed for the audience to go beyond the role of passive receiver of information, by actively engaging in the process of information exchange [14]. In her description of Participatory Design, Helen Armstrong argues that "Users increasingly expect some level of participation when they engage with content." [5]. To build these type of experiences, the use of computational approaches have been useful [15], particularly in the creation of meaningful dialogues with the viewers through participatory interaction [7]. These experiences allow results to be adapted to the behaviour of each participant and to the characteristics of its surroundings.

Participatory interaction allows for the audience to become active participants and have an impact in the artifact, either in the process of its creation or in the final object. We focus on this interaction between audience and final artifact and in which extent this object can adapt to the behaviour of its audience and to the characteristics of its surroundings. This dialogue between the artifact and its audience aims to create a closer relation between them which will have a positive impact on how the audience perceives and retains the visual message. As a first approach to this concept, we have decided to address the current issue of water pollution, as it is an issue of utmost importance and urgency, and so must be communicated in the most effective way possible.

To deepen the meaning of the experience created by interacting with the artifact, the type of interaction offered is not merely an activation of the artwork. What the participant does will leave a personal mark on the visual environment and that mark will depend on him/her and will not be the same for every participant. The participant can choose to be part of the problem or part of the solution. In addition to that contribution, it is a moment for stopping and reflecting on the urgency to stop water pollution by reevaluating daily habits. The visual component is contaminated by the behaviour of past participants as the artifact exhibits the collective result of the past participations that may no longer be physically present.

2.2 Approach

To approach the water pollution issue, we took as starting point a photograph taken by Mário Cruz, with which he was distinguished in the Environment category of the World Press Photo 2019 contest. The photograph shows a child laid on a mattress, surrounded by solid waste that floats on Pasig River, which due to extreme pollution, was considered biologically dead in the 1990s [2]. This shocking picture is part of a project called "Living Among What's Left Behind".

Based on the elements of the photograph, we created a visual environment composed of rectangular geometric fragments — representing solid waste — that vary in width, length and transparency. Their position also varies slightly to simulate objects floating on a river choked with solid waste. To reinforce the crucial role of the viewer in the artifact, he/she is visually represented by the word "YOU". The environment around that element is affected by the viewer's behaviour. At this point, the role of the viewer changes from passive spectator to active participant.

There is a typographic component that complements the interactive one. While the participant is interacting, some sentences appear above the waste and their content also changes according to the participant's behaviour.

2.3 Implementation

For this project we focused on the interest of the public — or lack of it — on this subject, because *interest* is what generates awareness and meaningful action–reaction. Empirically, we can argue that when a person shows interest in something, he/she takes time observing it and approaches it. So we can assume that if a participant looks at the artifact for more than just a few seconds and approaches it, is showing interest. On the other hand, if the participant looks away or distance himself from it, shows lack of interest on the matter.

We focused on analyzing if the viewer is looking at the screen and the distance he/she keeps from it. These behaviours have an impact on the fragments around his/her representation in the artifact and on the sentences shown. That impact will be explained in detail below.

As mentioned before, when the viewer looks at the screen, a white colored element with the word "YOU" appears, as his/her visual representation in the artifact. That element follows the now participant's position and movements creating a straight connection between the participant and the visual environment. The fragments around the "YOU" element will react to the interest shown by the participant. If he/she gets closer, the fragments around get smaller, on the other hand the fragments get increasingly bigger as he/she gets farther. This way, by showing interest, the participant creates a cleaner environment around him/her (Fig. 2) however, by showing disinterest, he/she creates a more polluted environment (Fig. 3).

There is also a reaction when the participant stops looking definitely at the screen after being there for only a few seconds. When this happens the "YOU" element turns black — the color of waste in our representation — and becomes one more fragment of waste in the environment (Fig. 4). This behaviour is intended to represent the consequences of generalized disinterest on this matter, which is an obstacle to solving the problem. The participant is not responsible for the consequences of the previous participations, however is responsible for his/her own choices and how they will affect positively or negatively the visual environment. Although the narrative is quite linear, the role of the participant in this project is not merely an activation of the artifact based on a linear action–reaction [13]. The participant leaves a personal mark on the visual environment that will depend on his/her behaviour and add meaning to the sum of the previous participations. At any time we can observe if there has been a general interest or not from the participant by analyzing the amount of waste left by the ones that did not stopped and cared.

Figure 2: A clearer environment is created and the sentences have more detailed content — e.g., *avoid disposable plastics* — when the participant shows interest.

Figure 3: The environment gets more polluted and the sentences more striking — e.g., *it won't stop until you stop* — as the participant gets farther from the artifact.

Figure 4: The disinterest of the participant leaves a negative mark on the visual environment.

The content of the sentences shown above the waste also change according to the interest shown by the participant. They can be more informative and detailed if the participant is showing interest or they can be more striking and urgent if he/she is disregarding the message.

2.4 Technical Description

This project was developed using OpenFrameworks [11] and Processing [10]. We use OpenFrameworks, specifically ofxCV library, to detect the participant's face. OpenFrameworks communicate with Processing through OSC and sends it the following information: number of faces detected, *x* and *y* position of the closer face detected and its *width*. With Processing, we create all the visuals and use the information received from OpenFrameworks to change the visual elements according to the participant's behaviour. For example, the *x* and *y* position define the movement of the "YOU" element, while the *width* is used to analyze the participant's distance from the screen. For example, if the *width* of the face is increasing, that means that the participant is getting closer.

3 Future Work

Our investigation lies in exploring the ability of a visual communication object to adapt to its context — either the audience behaviour or the characteristics of the of the surrounding environment. In the next iteration of this project we intend to enable the system to take into consideration more than one participant, the number of people looking at the artifact and the background noise.

Concerning the behaviour of the system, we aim to create, at least, three different behaviours for three different context situations. Those behaviours will be tested and combined so the message can better reach its audience in different contexts.

4 Conclusion

Water pollution is an issue increasingly discussed as its consequences are getting more visible and worrying. All means and media are important to raise awareness for a problem that depends on human action to be solved. Participatory interaction in visual communication can create a closer relation and dialogue between the message and its receiver in the contemporary digital society. In this project the public is actively warned to a problem that affects our present and future. By participating in this dialogue, the public gets an active role in understanding the consequences of its actions as individuals. However, the participant also has a passive role as the project aims to create an experience that stimulates future reflection and actions on the matter.

This is a first approach on the subject. The next steps will evolve the concept further, increasing the effectiveness and the involvement of the participant in the message. Also the adaptive capacity of the system to its surroundings and to the public behaviour will be further developed and refined.

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