



EMOTIONAL EXPRESSION THROUGH COLLABORATIVE PERFORMATIVE INSTALLATIONS

DECO3850 REPORT

Team Broken Chords

Performative Installations have been demanded more frequently by public spaces around the world. While expression is rarely seen within said public spaces. The following report will explore the correlation of users expressing emotion through collaborative performative Installations. While giving the insight on the creation of such an installation called ARTEMIS (Augmented Reality Teaching Everyone Music in Society). ARTEMIS created by team Broken Chords is a physical performative public installation. Where users can harness their creativity on a whiteboard canvas. While receiving musical feedback that represents what they drew. ARTEMIS will be featured within an exhibit in hoping to observe user interaction and any emotional expression.

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Physical Computing & Interaction Design Studio Reflective Report

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Introduction

Physical Computing and Interaction Design (DECO3850) is a course provided by the University of Queensland. Which challenge students in creating physically interactive installations that will be displayed within a public place. These physical installations will use unconventional methods when being implemented. As experimenting with said methods will ultimately create different user experiences. That will obtain useful data on different types of human and computer interactions.

As my team, Broken Chords. inspired by new interfaces for music expression created ARTEMIS. An installation that implements a way for user's drawings to be calibrated into music. ARTEMIS is implemented as a performative installation. Where user's interactions will be performed in public, where they control both the input and output of ARTEMIS. This allows the user to interact using creativity. While, receiving feedback that ensues emotion. In hope allowing the user to express said emotion.

The aim of this report is to provide an insight on the initial design and development phases ARTEMIS went through. Whilst also studying how users interacting with performative installation and if they express emotion while doing so. This document will be first exploring research made from a variety of resources on aspects about performative installations. Then with said research explaining through ARTEMIS elements I contributed on. Each contribution element will be informed through the initial design, deployment and final analysis. While being relevant towards the research. Where the analysis will be conducted after the deployment of ARTEMIS.

Background Research

RESEARCH ARGUMENT

The following research argument will be explored throughout the document by providing observational feedback: The study of users expressing emotion through collaborative performative Installations when interacting with new interfaces.

COLLABORATIVE PERFORMATIVE INTERACTION

Performative interaction is explained as "any interaction or technology that is influenced by or affected by the spectacle resulting from its use, the public setting where it is used, or the presence of spectators as an audience."

Where simply the interactions the user presents will be performed towards other users (Williamson, Hansen, Jacucci, Light, & Reeves, 2014). Where performer's interactions that are most central to the performance, as such interactions are usually the focus of attention for others. (Reeves 143 - 144)

As the original creators of the reactTable mentioned that "Playing and creating music with the help of digital tools can be a social and collective experience that integrates both collaboration and competition. While it also provides an excellent ground for studying and comparing interaction by both dilettantes and experts, both children and adults" (Jordà, Geiger, Alonso, & Kaltenbrunner, 2007). Which concludes that having a performative installation will succeed in making users collaborate.

EMOTION

A definition is required to collect any relevant information that may be useful when observed from users. Michel Cabanac (2002) defines emotion, as a sudden experience of positive and negative feelings, as distinct cognition or volition. Although, Michel (2002) does mention within the document that he has argued that these experiences have been stated as a mental state, where emotions have also been considered as merely a somatic response. Either definition will suffice when introduced to expression. Throughout this report the main emotion that ARTEMIS will be focusing on, is positive. While other emotions that ARTEMIS was not supposed to induce will be further documented and analyzed.

EMOTIONAL EXPRESSION

Emotion is the cognition on which the user is experiencing throughout their activities. Although they feel emotion, the way they express said emotion is a different story. This is defined through the Encyclopedia of Behavioral Medicine (Skinner, 2013) as he states that “Emotional expression should be distinguished from emotional experience in that it is possible to experience emotions without expressing them”. However, a user is still able to express emotion through verbal and nonverbal methods (Skinner, 2013).

Skinner (2013) also explains that “emotional expression is an important part of emotion regulation and can affect health outcomes” while explaining briefly about how people experiencing positive emotions will reflect more with the environment they are placed in. This will be further analyzed within the projects testing phases.

Keywords: Performative Interaction, Emotional Expression, Collaboration

Individual Contribution

ARTEMIS FUNCTIONALITY (MUSICAL AND DRAWING)

DESIGN PROCESS

The initial design phase started within the first week the group Broken Chords was created. As we were combined with one initial subject that we were brainstorming for 2 weeks. It was only natural that we would design a project that implements the idea of New Interfaces for Music Expression. However, the meeting was quickly concluded as our initial design choices were made. This was to implement a unique way for people to perceive music. Which was resolved by making our main interaction with our project that projects the user's drawings on a clear surface i.e a window or any glass plain. While turning said drawings into music. With a little research, later the exhibit setting we were implementing the ARTEMIS for. We found that our installation would be classified as an Opportunistic performance: which involve interaction in a public setting in which a user becomes of interest to others and thereby

becomes a performer, typical examples being users of interactive museum or gallery exhibits. (Reeves 143 - 144)

The music would be affected by two main factors. The instrument will be determined towards what color the user is drawing with. A composition of instruments will be allowed. While the pitch of the instrument will be determined on the position of said colors drawings. During exhibit the colors were red as guitar, blue as drums and green as bass. Position of the drawing and pitch will be discussed within the next contribution design.

EXHIBIT OBSERVATION

During the exhibit the drawing interaction produced feedback that overall was useful towards the overall project. Three types of instances would occur towards the interaction and feedback the users would experience. One, the user would use the drawing surface to project their emotions. This insured that the user would draw and react to the music generated accordingly. Two, the user would use their intuition on the position of the point in which they are drawing, to compose music. Three, the user would not consider any musical feedback and continuously interacted with the whiteboard without noticing any functionality. However, throughout the exhibit red as guitar would produce sound that was annoying. This would cause the users to only use two colors. This might have limited the user's emotion when they were drawing. However, user's expression seemed to increase. Users would also excessively use ARTEMIS for its unique interactions that it would lose meaning. An explanation that Baum, Li, and Usher (2000) briefly explain that excessive exploration can lead the user to experience high cost experimentation without realizing any benefits.

Also, to note: the creators of ReactTable (2014) have stated. Users that have prior knowledge would use it to interactive with said technology. This explains why users were using their intuition on how pitch is implemented. This would make them interact with ARTEMIS as a more experienced performer.

ANALYSIS

Overall the functionality displayed within the exhibit was up to par. As the base case functionalities were met. Users could draw pictures and gain musical feedback. However, a couple of improvements would have been ideal. Improving the sound that were generated would have enhanced the user experience. While also creating an atmosphere that would invite more

users to experience the project. Within the exhibit the notes that were being played did not contain any sustained notes. Instead notes would be played constantly. If you were to imagine a piano player continuously pressing the same piano key. About 45 per second. This would have been changed so the sounds emitted would not affect the users experience negatively. A minor change that would have increased the user's ability to project their emotion when they were drawing, would be to increase the number of instruments and colors.

CIRCULAR DESIGN (COLLABORATION)

DESIGN PROCESS

The design of the ARTEMIS went through a couple of iterations. However, while brainstorming ideas we all had to put in mind that the project must be a performative collaborated installation. Where at any time the user would be able to continuously experience the project with a friend or a stranger. With that in mind. The initial idea was to implement it as a whiteboard surface with a considerable length to fit multiple people. However, the scale was concerning, so with some research and we found an article authored by Vickie Elmer (2013) stating to boost collaboration consider sitting around a circular table. This sparked the idea of a waist height standing table that would allow users to stand and draw.

With the circular table design in mind. To produce different types of pitch the user must draw between the radius they are currently facing. Where the closest to the center point the higher the pitch. While, the closer to the circumference of the circle, the lower the pitch. The music will also be determined like a sonar, where the installation would read clockwise around the table in real time.

EXHIBIT OBSERVATION

The implementation of a circular table was a positive addition to the project. Where users would constantly have crowded around and interact with the table while expressing their emotions within their drawings. However, a common occurrence is where a primary user denoted as alpha. While, in collaboration with one or more users. Which within each scenario would experience said occurrences either both negatively or positively? Which would be further expressed when continuing their interactions with ARTEMIS. The following occurrences would happen. Alpha would either dominate the

experience. Alpha would try to improve other people's drawings. Alpha would either comment on other drawings made by other users or whomever is collaborating with it. Although these occurrences seem negative within a social standpoint. Towards a collaborative standpoint and within this document research question they were positive and will be discussed further on.

ANALYSIS

Although the table did show that users approached to interact within collaboration with other users. It seemed like the capacity was overloaded, as the table would only fit five people comfortably. There would be over 8 users trying to crowd around and affect other user's interactions. Assuming the budget of this project future has no limits expanding the tables circumference would be an ideal change or implementing it as a large hollow circle installation. Where there is an entrance within one of the sides of the circles. However, this change will also have to consider the speed in which the table reads. Overall the only design aspect I would change, is the overall look of the project. As exposed wood is too bland.

PROGRESS LED BAR (VISUAL FEEDBACK)

DESIGN PROCESS

The progress LED bars were initially a stretch goal within the middle of developing the main functionalities. However due to the user testing we obtained through the initial prototype. The users wouldn't physically know where the installation would be reading. So, one day I would play around the LED strip to see what visuals I would be able to implement. First the implementation of a one to one ratio on where the ARTEMIS is reading. This instantly showed an improvement, as visually you could see what colors were being read within the device. Although, I had time to implement another functionality within the LED's. I would then include a visual way to display on the LED's what colors are being detected when the ARTEMIS was reading. By simply showing these colors, the user would instantly be shown that the device is indeed working and playing the correct colors instrument. The LED's would also display the combination of colors that were being detected (ie. red and blue would make purple).

EXHIBIT OBSERVATION

Although the LED lights were only implemented for the user to physically visualize how the ARTEMIS functions. Most users seem to express more emotion and creativity while drawing. This is probably due to the fact there is some correlation between what color is being shown towards what emotion the user is feeling.

Further research shows that (Barbiere, Vidal, & Zellner, 2007) synesthesia a mixing of sense. Is mostly common when users experiencing a musical sensation will also see a color when listening to music. This also refers to Juslin & Vastfjall, (2008) "as emotion is induced by a piece of music because the listener perceives the emotional expression of the music, and then "mimics" this expression internally". However, color as shown within what emotion it represents has also been subjective to an extent. I.e. although blue is widely known as the color of sadness, (Barbiere, Vidal, & Zellner, 2007) shows data of people correlating it to happy music.

ANALYSIS

Upon further research and analysis of the data obtain throughout the exhibit. There would not be any changes that I would make towards the LED strip. However, inclusion of more visualizing implementations would be interesting to experiment with. For example, a LED matrix also showing the pitch of what the instruments are playing. An inclusion of any visualization that would improve the way the user perceives their own drawings.

Conclusion

The ARTEMIS as a new interface for musical expression was created to explore the user's creativity when they draw. While providing music that would allow the users to express emotion. Within a public setting this allowed the users to collaborate and become performers. Overall, when exhibited the users expressed enough information to conclude that ARTEMIS was a success. Although a few changes that were mentioned would've implemented a better project. However, the success of the subject ARTEMIS was created for was to study the user's emotional expression. Throughout the exhibit we would observe users constantly interact with ARTEMIS.

Due to the project being extremely user centered. While they controlled exactly what content is not only perceived by the users. The users also

controlled what music is being generated. This made the installation a new experience for every user that started to interact with ARTEMIS. Additionally, most users would find the installation interactions intuitive.

The build itself was implemented using creative interaction and creative feedback. This gave users free reign to interact with the ARTEMIS solely using their creativity. While the circular design was a positive way to accommodate multiple users to draw on the whiteboard. This in conjunction with the visuals the LED's would emit. User's will be curious to interact with ARTEMIS. However, the positioning within the exhibit did help in the fact that users would have a 360-degree angle of ARTEMIS. While the music emitted throughout the whole room. This enticed user around the hall to investigate.

These experiences the users would have would not only encourage observers to interact with the ARTEMIS. It would ultimately induce emotional expression. This is proved by not only ARTEMIS's functionality, it also was proved that collaboration within a performative installation also induced emotional expression. However, some users would refuse to use creativity and express emotion. While a few other exceptions were observed. User's expressing emotion would affect other users to not express emotion. There was different level of dominance towards the overall interactions a group of user's. These experiences were positive in the fact that ARTEMIS was built to make users express emotion.

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