

2016

Designing interactive digital installation for human-human interaction in live music events

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Designing Interactive Digital Installation for
Human-Human Interaction in Live Music Events
Interplaying

So Sun Park
Media Studies
April 2016

Senior Project

Submitted in partial fulfillment of the requirements
for the Bachelor of Arts degree in Media Studies

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Abstract

This thesis is a writing part of my senior project, *Interplaying*. In the 21st century, there is a strong trend of the audience's personal technology-dependent behavior in live music events, specifically music concerts and music festivals. This paper (along with the project) investigates the way to encourage the audience's human-human interaction in such events in order to allow audience members to better engage in live-music-listening experience's benefits such as socialization. This paper finds a lesson from human-human interaction in cultural/community festivals. Also, it does not criticize the presence of technology itself in the events. The project rather provides the way technology can bring the audience back to real environment from virtual communication. The prototype of *Interplaying* tangibly embodies the possibility of technology encouraging live social interaction amongst audience members. The video of implementation and specific making process of *Interplaying* can be found in my YouTube Channel:
<https://www.youtube.com/channel/UCKNXAqIvqc25JJ1CWdayqBA>

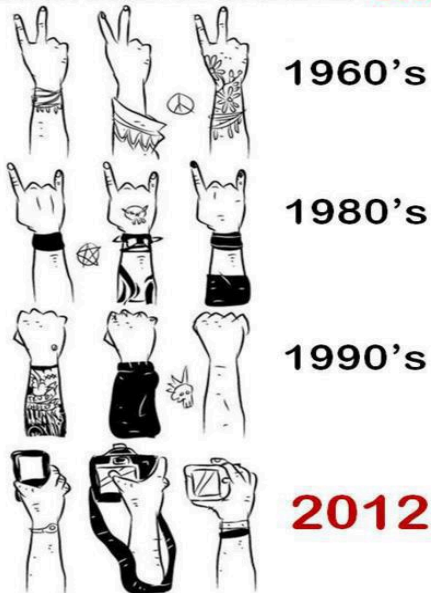
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Chapter 1: Introduction

Music concerts and festivals are one of the world's most popular type of live events where people physically gather together during a short period of time. Music concerts happen in various places from causal bars to professional performing venues. Music festivals, which started later than concerts, mostly happen in huge stadiums or performing venues. Popular ones, such as *Glastonbury*¹ (Contemporary music), *Tomorrowland*² (electronic dance music), and *Coachella*³ (Indie bands and electronic music) attract millions of people and earn huge revenues. While these events populate in a magnanimous scale of thousands of people with similar music tastes and enjoying similar activities in a limited space/time, how much do the audience members get to socialize and interact with one another?

ROCK CONCERT AUDIENCE EVOLUTION



ROCK CONCERT AUDIENCE EVOLUTION

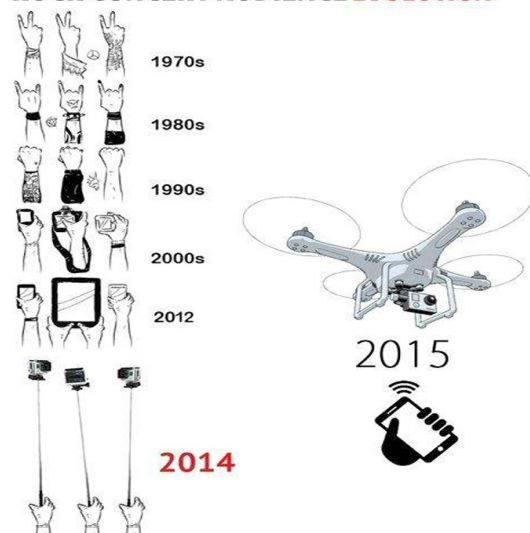


Figure 1.0 Rock Concert Audience Evolution

Figure 1.1 Rock Concert Audience Evolution 2

¹ Founded in 1970s, it is a five-day festival of contemporary performing arts in United Kingdom. Leading pop and rock artists with thousands of other smaller performances. Over 100,000 tickets are sold annually.

² Started in 2005 in Belgium, it is one of the biggest electronic music festivals; 360,000 attendees in 2014.

³ Annual music and arts festival held in California, U.S.A., since 1999. Over 84 million dollars earned and 198,000 tickets sold in 2015.

Figure 1.0 is created by Visual.ly, an online community platform for data visualization and infographics.⁴ The figure demonstrates the transformation of the audience behavior in rock music concerts. Yet, this phenomenon is not limited to rock music concerts. Rather, the figure is highly applicable to general live music events such as Pop/Hip-hop/R&B concerts and music festivals. Figure 1.1 is an upgraded version of the image, which was created and spread by anonymous Internet users that agreed with Figure 1.0's implication and updated the figure. According to these figures, in the 1960's, the audience used to hold up one's hands, waving or making certain gestures towards the stage. The illustrations for 2012-2015 humorously depict the trend of the audience with high-technology - various mobile and digital devices including cameras, smartphones, tablets, and even a drone. Although these are small examples, they surely reflect the general observation of the audience's personal attachment to technological devices in live music events. The technology is now an active component of the performance experience of audience members and is mediating such experience.

1.1 Interaction in Community Festivals

In contrast, the audience in community festivals interacts with one another. Here, community festivals refer to cultural or regional festivals evolved from neighborhood, community, and regional scales. The global examples include Spain's *La Tomatina* Festival and India's *Holi* Festival. Although such festivals also happen in highly human-concentrated settings like live music events, the participants in these types of events share one-on-one interaction with other people (including strangers) in the events.

⁴ Akito Van Troyer, "Hyperaudience : Designing Performance Systems for Audience Inclusion " (MS Thesis, Massachusetts Institute of Technology, 2012), 23



Figure 1.2 La Tomatina Festival



Figure 1.3 Holi Festival

In Thailand's *Songkran* Water Festival, people splash water on one another. Attendees, regardless of whether they are local residents or foreign visitors, play with each other at the event by shooting water guns or throwing water balloons. In India, Holi festival celebrates the springtime with colorful powders that symbolize flowers and spices. Participants throw powder and water balloons, while dancing and chasing one another. Similarly, in *La Tomatina* festival, which is hosted in the small town of Valencia, Spain, people squash tons of tomatoes and toss them at one another. Furthermore, people attending Bo-ryung Mud Festival in South Korea throw themselves into the Mud beach and play with mud like they would with play-dough. Last but not least, Gloucester in England annually hosts Cooper Hill Cheese Rolling Festival in which people race down a grassy hill, chasing after a huge rolling wheel of cheese altogether.

All these community-based festivals have an important similarity that generates live human interaction: they all have shared mediums. *Holi* Festival has colorful powder, *Songkran* has water balloons/guns, and *La Tomatina* Festival has tomatoes. People in the Mud Festival play with mud and those in Cooper Hill Cheese Rolling Festival with cheese products. Such shared mediums provide opportunities for participants to interact with one another. The environment with such collective medium and activity makes people feel comfortable to initiate a random contact even with strangers. Community festivals create the interaction that is live and human-to-human in a real environment. In contrast, audience members in music concerts and festivals often

neglect the live interaction with fellow participants. They are recently even more isolated from one another, being distracted from the real environment by virtual interaction through personal technological devices.

Why is there a different type of interaction happening in these two separate kinds of live events? Similar to community festivals, audience members of live music events are surrounded by hundreds of people that share the similar music tastes, similar experiences, and probably even similar emotional statuses at the moment. Yet, how many times would they get to socialize and interact with another audience while focusing on how the shows are being recorded in their personal digital devices?

1.2 Why live social interaction?

Why should live social interaction be more encouraged and the use of personal technologies like social media be discouraged? Sherry Turkle, MIT psychologist who studies human and computer relationships, stresses the importance of human conversation over technology-mediated virtual connections. As music concerts/festivals contain great opportunities of socialization and human contacts, it is important to know why human-human interaction is valuable in this virtually connected world.

Through the Ted Talk ‘Connected, but Alone?’ and publications including *Alone Together*, Turkle discusses the limitation of virtual communication. We seek connection and want to be with each other based on our human desire for social activity. With the development of technology, we think being connected through virtual spaces will make us less lonely.⁵ Yet, many surveys and psychology research projects have shown that our relationship to social media and virtual environment has not satisfied us, and we still feel lonely. Turkle explains this phenomenon to be troublesome, since it diminishes the ability of us relating to ourselves and our capacity for

⁵ Transcript of "Connected, but alone?", Ted Talk by Sherry Turkle: “Connected, but alone?,” https://www.ted.com/talks/sherry_turkle_alone_together/transcript?language=en

self-reflection.⁶ For example, in her book *Alone Together*, one of her interviewees, who is fond of technology and robots, says that in fact, even an unpleasant or sad person makes him feel alive.⁷ Although technology has provided him entertaining activities to spend time with when there is nothing to do or when no one is around him, he still desires and prefers human interaction. He expresses that human narrative conveys the feeling of authenticity and reassures a certain dignity as a human being in this world. Internet world such as social networks has created extensive virtual communication spaces, but, as Turkle describes, Internet socialization is the illusion of companionship and lessens our capacity for self-reflection. It is hard to understand one another just through text messages, social media posts, and virtual conversations. Most of personal conversations in social media tend to stop in that virtual world and do not continue to the reality, where we actually exist.

“The greater the proportion of face-to-face interactions, the less lonely you are....

The greater the proportion of online interactions, the lonelier you are.”

- John Cacioppo, the director of the Center for Cognitive and Social Neuroscience at the University of Chicago⁸

The 21st century’s new regime of “I share therefore I am” is based on human behavior of ‘I have a feeling; I want to send a text/post it on social media/etc.’⁹ We try to connect more and connect whenever we feel something or experience something. Yet, Turkle argues that such virtual communication makes us isolated from the real world at the same time.¹⁰ Overreliance and over-attachment to the virtual connectivity through personal devices does not let us appreciate

⁶ Ted Talk by Sherry Turkle: *Connected, but alone?*

⁷ Turkle, Sherry, *Alone Together: Why We Expect More from Technology and Less from Each Other*, (New York: Basic Books, 2011), 252

⁸ Marche, Stephen, “Is Facebook Making Us Lonely?”, *The Atlantic Monthly*, May 2012, accessed February, 2016 <http://www.tesd.net/cms/lib/PA01001259/Centricity/Domain/295/is%20facebook%20making%20us%20lonely.pdf>, 68

⁹ Ted Talk by Sherry Turkle: *Connected, but alone?*

¹⁰ Turkle, *Alone Together*.

other people around us. If you can get out of that limitless aspiration of connection in the virtual world, you find our own space, gather yourself, and then reach out to other people to form real attachments.

Music concerts and festivals are the type of events with which people emotionally and physically engage. Yet, the audience's personal technological attachment turns people to the virtual social networks to share videos, photos, and ultimately emotions. Although audience members may seek social media to get more Likes/Loves/Retweets on their posts, they would not get any live emotional feedback or empathetic understanding that would keep engage and excite them to the live events. It disturbs self-reflection. It deviates the emotional and physical excitement that they wanted to share with others into the addiction or loneliness of constantly checking social media recognition by other users that are mostly not even there with them. As Turkle argues about the limitation of social satisfaction being achieved in virtual environment, live music events are the perfect environment to fully engage with human-human interaction. Why not stay in real time and real space and communicate with people who can empathize your emotion and thus, enhance your experience in that environment?

*“We are not in a position to let the virtual take us away from our stewardship of nature,
the nature that doesn't go away with a power outage...
to understand desire, one needs language and flesh.”*

– Sherry Turkle¹¹

1.3 Objective & Scope

While there is a distinct trend of the audience's personal human-machine interaction with mobile and digital devices in live music events, this project values human-to-human live interaction. It is mainly because socialization with other participants has been recorded as a major motivating and satisfying component of public event experience in industrial surveys. The music

¹¹ Turkle, *Alone Together*, 255

concert/festival event is one of rare settings that numerous people (the largest number was 175,000 per day in Glastonbury Festival) physically gather together and share a similar experience. Thus, this paper puts importance on taking full advantage of such a human-concentrated setting, which contains a great potential for human-human interaction.

Learning the process of participants' interaction from community festivals, this project aims to generate more human-human interaction in music concert/festivals by creating the shared medium, *Interplaying*, for audience members. *Interplaying* is in the form of interactive digital installation. It attempts to initiate a live interaction among participants, encouraging them to play with the same technological medium together with live feedback.

This paper provides a unique vision about social dynamics in music concerts/festivals. Besides this written thesis, the project also has a tangible digital installation *Interplaying* to implement the process of encouraging face-to-face communication specifically for live music events. The project explores the way to motivate and create live interaction amongst audience members. It aims to encourage audience members to choose human interaction within the real space. Users of social media or digital communication tend to seek communities because they cannot find one in real life. Creating physical connection and companionship through human-human interaction allows people to actually feel they are there. It is expected to accompany the effect of discouraging them being individually attached to personal technological devices like smartphones. This project wants to create real sense of human interaction to expand a socializing experience in the live music events.

It ultimately aims to amplify social aspect of technology instead of personal side, optimizing the technology for the human-concentrated environment of live music events. Thus, this approach will enhance people's social experience in the events and improve their live-music-events experience.



Figure 1.4 Screenshot of first prototype of 'Interplaying' with a leap motion device

The system of *Interplaying* is designed with the following concepts:

- The installation incorporates music components, as it is specifically designed for live music event settings.
- The system's input is audience members' hand movements touching the virtual buttons on the screen. The audio outputs are short melodies or beats that are copied from the song in the background which is played by musicians on the stage. Another type of output is visual images triggered by hand gestures.
- The installation welcomes any multiple audience members to participate at the same time and share a simple recognition of each other's presence – smile, eye contact, or even short conversation.
- The interface is designed to be intuitive and easy for general audience members to play with as there is no time to learn and adapt in a fast-moving live music events.

To prevent misunderstanding, this project is neither against the existence of technology in live music events nor considers the technology itself as a problem. Rather, it embodies the technology as the medium to bond audience members for two main reasons, which will be more

specifically discussed in Chapter 2.2. Shortly, technology is already an important component both to the public and the industry of live music events. Also, this project attempts to show technology's potential of creating social connectivity in real life space. As figure 1.0 and 1.1 implicated, live music events have been criticized as being full of people sticking their eyes to their mobile digital devices. This project provides an alternative technological design system which will positively influence the audience's social experience.

“If social media let you organize a game of football among your friends, that's healthy. If you turn to social media instead of playing football, however, that's unhealthy.”

– Stephen Marche, The Atlantic Monthly¹²

In addition, due to the program's active element, this is expected to work better in the music concerts/festivals with loud music performances. Thus, it would potentially exclude classical music and be more applicable to Electronic, Pop, Hip-Hop, and Jazz music genres. Moreover, while there are a lot of different technologies happening in recent music concert/festivals, such as hologram or pyrotechnics, the thesis focuses on technological devices that the audience personally uses except stage-oriented decorative technologies.

¹² Marche, “Is Facebook Making Us Lonely?”, 68

Chapter 2: Background

2.1 Terminology: Interactivity/Interaction & Digital Art

As this thesis focuses on creating human-human interaction and involves the project of interactive digital installation, it will explore the terminology of “interaction” and “interactive digital installation” based on discussions and researches related to “digital art.”

The 1901 Dictionary of Philosophy and Psychology, which is one of the first books that mentioned the terminology of interaction, defines interaction as “the relation between two or more relatively independent things or systems of change which advance, hinder, limit, or otherwise affect one another.”¹³ In *Aesthetics of Interaction in Digital Art*, Kwastek explains that when sociology became established as a scientific discipline, at the beginning of the twentieth century, the concept of interaction was applied to social and societal processes; “interactivity” was first used to characterize interpersonal relationships in Germany (by Georg Simmel) and in 1909, the term was discussed in the context of “social interaction” and “the interaction of human beings” in the English-speaking world (by George Herbert Mead and Edward Alsworth Ross).¹⁴ *Multimedia*, which is the book about digital media projects since 1900s, defines “interactivity” as the ability of the user to manipulate and affect one’s experience of media directly, and to communicate with others through media.¹⁵ According to the Cambridge online dictionary, “interactive” means “involving communication between people (or reactions between things that work together).”¹⁶ Based on these ideas about “interactive,” this paper will use the term as a participant influencing the ongoing event by making certain choices or communicating with other participants.

¹³ Katy Kwastek, *Aesthetics of Interaction in Digital Art*, (Cambridge : The MIT Press, 2013), Kindle edition, 4.

¹⁴ Ibid.

¹⁵ Packer, Randall, and Jordan, Ken, *Multimedia: From Wagner To Virtual Reality*, (New York: W. W. Norton & Company, 2001), Overture, xxx.

¹⁶ “Interactive”, Def.1 Cambridge online dictionary,

This paper defines the project, *Interplaying*, as “interactive digital installation” based on the history and terminology about digital/media artworks. According to *Aesthetics of Interaction in Digital Art*, “digital art” and “computer art” are more specific terminologies for “media art.”¹⁷ “Computer art”, which was coined before the 1990s, referred to a digital media with computer-generated graphics. In the 1990s, “digital art” replaced “computer art.” Digital art indicates “purely immaterial works expressed in code, software, or data” as well as “installations and performative works that use digital media.”¹⁸ It also refers to works that primarily use digital technology as part of their method of production and the interaction between the recipient and the digital systems.¹⁹

“Interactive art” commonly refers to digital artworks that require the viewer to engage in some kind of activity that goes beyond purely mental activity. While Söke Dinkla²⁰ proposed the definition of ‘interactive art’ to be serving “category-specific designation for computer-supported works in which an interaction takes place between digital computer systems and users,” the boundary of ‘interaction’ is still controversial.²¹ This is because the interactivity in interactive art is measured in terms of either “human-machine communication or sociological concept of interaction (in other words, on the basis of the ideal of face-to-face communication).”²² Like most digital artworks, this interactive digital installation explicitly uses computer, computer-generated graphics, coding, software, and data. It is also “interactive,” based on the term “interactive art” – *Interplaying* requires the viewer to engage in some kind of physical activity. On the other hand, the project is unique in that it does not stop at user-computer interaction (like the definition of “interactive art” by Söke Dinkla), but pushes the interaction further to user-user.

¹⁷ Kwastek, *Aesthetics of Interaction in Digital Art*, 1-5.

¹⁸ Kwastek, *Aesthetics of Interaction in Digital Art*, 4.

¹⁹ Ibid.

²⁰ The director of the Wilhelm Lehmbruck Museum in Duisburg and the author of various publications including a standard reference work on interactive art.

²¹ Kwastek, *Aesthetics of Interaction in Digital Art*, 4.

²² Ibid.

2.2 Social interaction in live music events

One of the biggest reasons why people visit live music events instead of listening to music at home is socialization. Live music events have an interactive dynamic generated by enthusiastic audience members interacting with the performers as well as each other.²³ The collective responses and attention of audience members construct the gig's experience, mood, and energy.²⁴

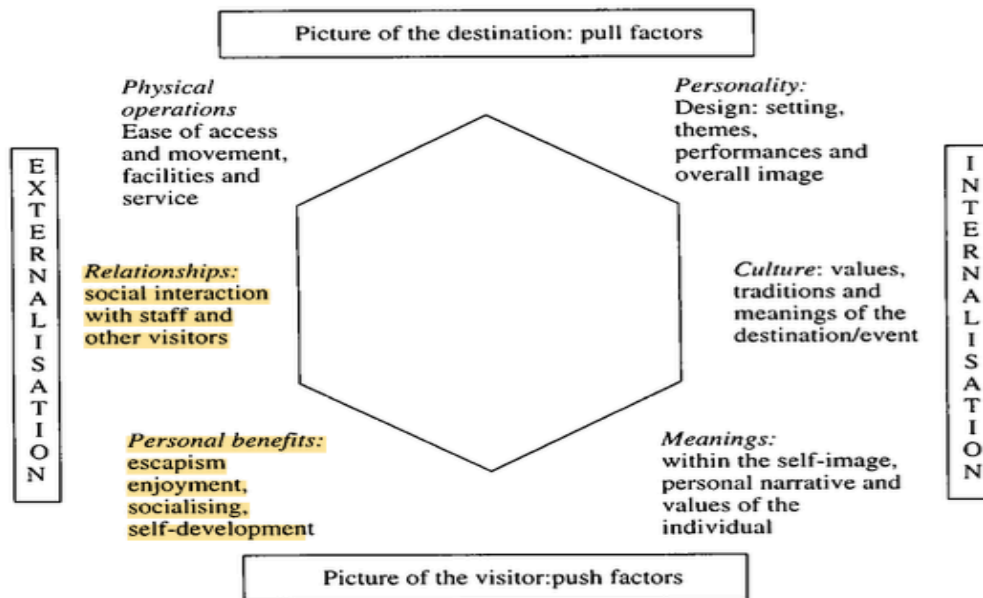


Figure 1: The prism of experience (after Kapferer, 1998)

Figure 2.0 Hexagonal Diagram of Brand Identity Prism (Kapferer, 1998) applied to music festival experience (Morgan, 2006)

Two categories of hexagonal diagram, which describes motivation and satisfaction of visitors in live events including music concerts/festivals, involve socializing; “*Relationship*”:

²³ Oakes, S. “Demographic and sponsorship considerations for jazz and classical music festivals”, *The Service Industries Journal* (2003): Vol. 23 No. 3, 165-178. (cited in Pitts and Burland 2013).

²⁴ Kubacki, K. (2008), “Jazz musicians: creating service experience in live performance”, *International Journal of Contemporary Hospitality Management*, Vol. 20 No. 4, pp. 401-411. (cited in Pitts and Burland 2013).

social interaction with other visitors” and “*Personal Benefits: socializing.*”²⁵ In the events management industry, social engagement among audience members is studied to develop a strategy for audience development and event promotion. The interviews that were conducted in the UK Jazz festivals and live Jazz concerts in smaller venues by Pitts and Burland showed that audience members were receptive to engage in conversation with other listeners who have similar taste and knowledge about the music.²⁶ Also, the possibility and the openness for such interaction and conversation is considered more important than the quality or depth of the conversation. Socially enjoyable, the presence of a like-minded, appreciative audience not only improved the audience experience at the performances but also one’s impression about quality of the shows as well.²⁷

However, audience members’ increased attention to personal technological devices decreases their motivation and openness to talk to one another. In music festivals that offer various activities and venues other than main stages, such behavior is observed even after they finish recording stage performances of musicians. The distraction by technology and online conversation does not easily bring them together for live interaction. People’s individual technology-dependent behaviors do not let them make a good use of highly sociable environment full of fellow participants. The project aims to design the system that would decrease such personal human-technology interaction and motivate more human-human interaction.

²⁵ Morgan, Michael. “Making Spaces for experiences” *Journal of Retail and Leisure Property* (2006) 5, 305–313, Accessed February, 2016, doi:10.1057/palgrave.rlp.5100034, 306-310.

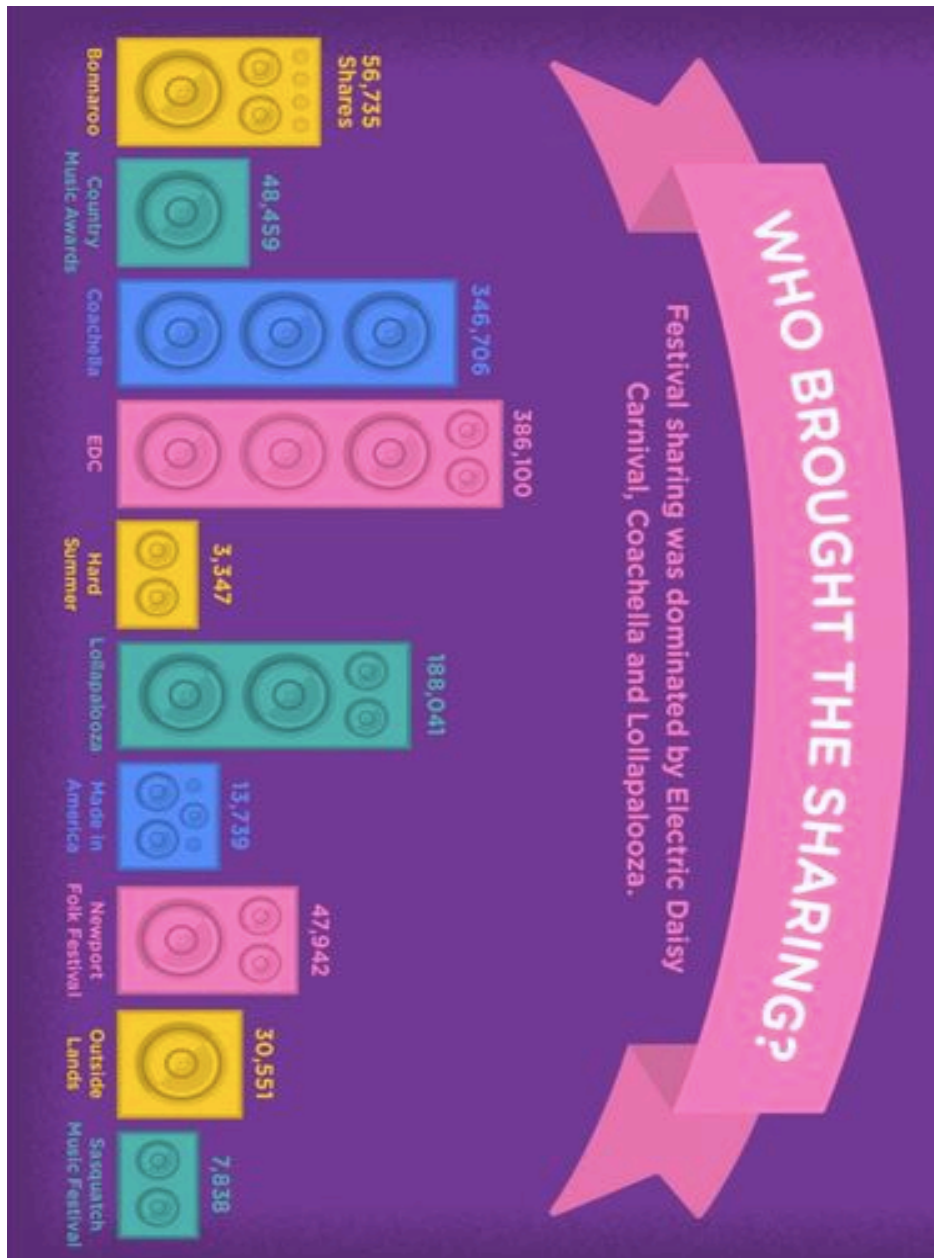
²⁶ Pitts, Stephanie E., and Burland, Karen. "Listening to Live Jazz: An Individual or Social Act?" *Arts Marketing: An Intl Jnl Arts Marketing: An International Journal* 3.1 (2013): 7 – 20, Accessed February, 2016. doi: 10.1108/20442081311327138, 10-12

²⁷ Pitts and Burland, "Listening to Live Jazz: An Individual or Social Act?", 12-13.

2.3 Human-Technology vs. Human-Human interaction

Figure 2.1
<Summer Music Festivals 2014>

Number of social media shares of online content about music festivals



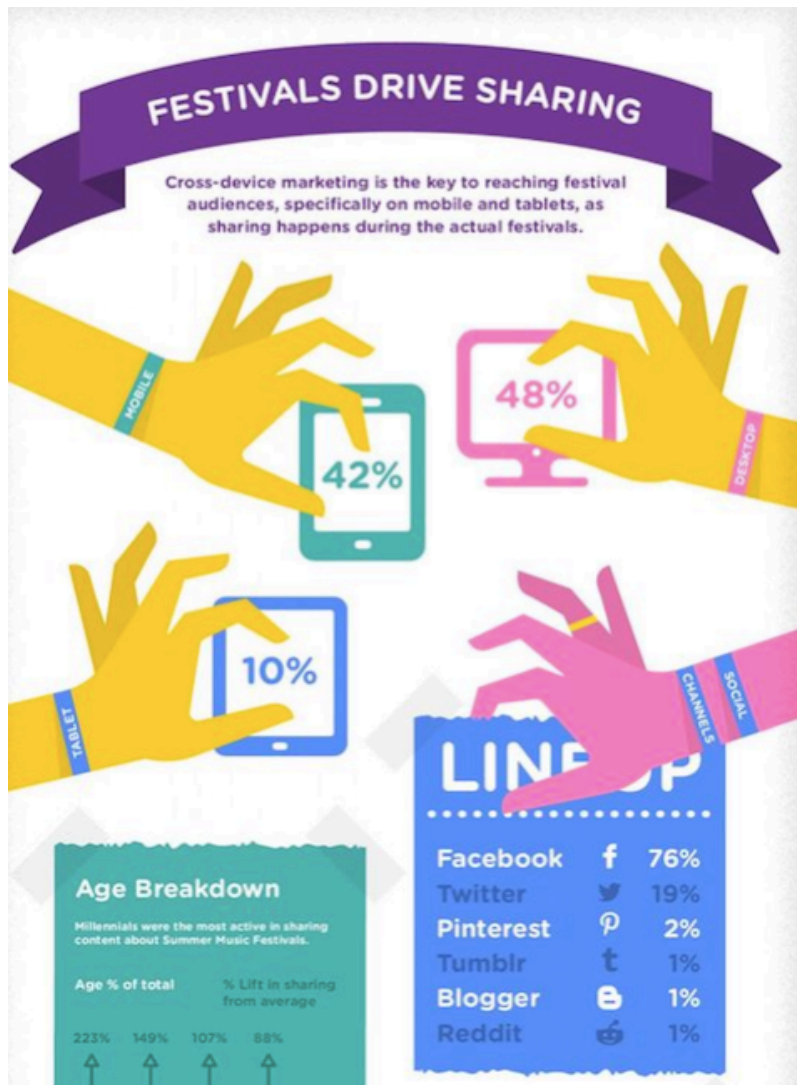


Figure 2.2

Heavy dependency of marketing strategies on multimedia and Internet-based communication

Figure 2.1 and 2.2 show how much social media communication via technologies are significant in live-music-event experiences before, during, and after the events both to the audience and the hosts. In such highly technologically marketed events, it seems natural for audience members to constantly use the online access to share their experiences as well as to get updated with the event information.

In music concerts/festivals, the audience uses smartphones, tablets, and cameras to collect their experiences in order to connect with others.²⁸ They are more focused on sharing their

²⁸ Troyer, "Hyperaudience : Designing Performance Systems for Audience Inclusion," 23-24.

experiences with their friends or the public in the virtual world and online communities. The more they engage in such virtual communication, the less space is left for social interaction with real people at the events.

In a more general context, the wide access to Internet technology in this modern age has made a large amount of human communication possible through technology (without real human contact). Thanks to the digital devices, people now communicate more often and with more people than ever before.²⁹ However, according to Turkle, technology generates some worrisome effects on human interaction. Her publication, “Reclaiming Conversation: The Power of Talk in a Digital Age” explains that the overreliance on digital communication has affected the ability to have effective fact-to-face exchanges but has also diminished our capacity for empathy and intimacy.³⁰ People have become dependent on their personal mobile devices even though they are physically present with other live human beings. Turkle describes that people with the phones in the public space mark themselves as absent – sometimes people even signal their departure from the reality by putting a phone to their ear in the public space.³¹

*“We turn to technology to help us feel connected in ways we can comfortably control.
But we’re not so comfortable. We are not so much in control.”
– Sherry Turkle³²*

As a matter of fact, the cynical sentiment about mobile and digital technology and social media prevails in the society. It argues that such technology generates less face-to-face social interaction and bring the users into a virtual web-based environment. As technology becomes “portable, pervasive, reliable, flexible, and increasingly personalized,” people are now “wired” to

²⁹ Overly, Stephanie. “Sherry Turkle: We Need To Talk,” Digitalis Magazine, March 02, 2016, <http://www.digitalismag.com/future-of-work/2015/09/29/digital-economy-defining-entire-generation-03511607>

³⁰ Ibid.

³¹ Turkle, *Alone Together*, 144.

³² Transcript of “Connected, but alone?”, Ted Talk by Sherry Turkle: “Connected, but alone?”

their personal digital devices; especially, phones are hardly ever out of people's hands.³³ People with mixed or negative feelings about the advance of technology describe such phenomenon that technology takes a person away from real people that s/he is physically beside, making s/he to live a "divided life."³⁴ The availability of personal mobile and digital devices has allowed users to personally connect with others in the virtual world, not contributing to live social connection like face-to-face contact. Although Internet communication attempts to satisfy human desire of connection, it cannot make up the absence of "real thing" – actual people in the flesh.³⁵

Yet, instead of getting rid of technology from live music events, this project incorporates technology to create human-human social interaction that cultural festivals generate in live music events for two reasons. First, the audience and the industry are already accustomed to technology and are comfortable with it. As the figure shows, marketing strategies of the events as well as communications between the audience and the event are inseparable from social media and Internet technology. Moreover, the music event management companies actively incorporate the technology to make the audience's experience more convenient and to manage huge data of the events – information sharing, coupon/ticket, or wearable technology. The audience is getting more and more connected to the technologies – mobile, digital devices – that augment their experience. Thus, this project views that it is realistically difficult to completely remove technologies from the events.

Another reason that this project is not against technology is because technology is not the fundamental problem of lacking human-human contact. The audience's personal technology-dependent behavior is more based on how one uses technology. Technology is not inherently personal or is designed to isolate humans. The relationship between humans has been changed, after the development of technology, because of humans' choices on machines over real humans,

³³ Clark, Andy, *Natural-born cyborgs: minds, technologies, and the future of human intelligence*, (Oxford: Oxford University Press, 2003), 21.

³⁴ Clark, *Natural-born cyborgs*, 9.

³⁵ Marche, "Is Facebook Making Us Lonely?", 68.

not because of the technology itself.³⁶ For example, one chooses to buy groceries from a machine instead of a human clerk. Someone would not even go to a brick and mortar store and use an online grocery store website.³⁷ Borrowing this idea, this project provides an alternative perspective about technology in such events by deviating the audience from the personal use of technology. The project wishes to detach the audience from its personal device, but does not criticize the existence or incorporation of technology in the events. Rather, it attempts to experiment ‘social’ aspect of technology that is beneficial for human-human interaction. It is expected to enhance the audience’s social experience in a massive live human-concentrated setting, which is a major difference of the events from other daily life music-listening experience.

*“If you use Facebook to increase face-to-face contact, it increases social capital...
How we use technologies can lead to more integration, rather than more isolation.”
- John Cacioppo³⁸*

2.4 Case Studies

The project creates the interactive digital installation as the shared medium that would bring audience’s attention less to their cellphones or personal devices and rather into social and live interaction with fellow participants. The *Text Rain* and piano scenes in the movie ‘Big’



*Figure 2.3
Participants in the
gallery playing with
'Text Rain' installation.*

³⁶ Marche, “Is Facebook Making Us Lonely?”, 68-69.

³⁷ Ibid.

³⁸ Marche, “Is Facebook Making Us Lonely?”, 68.

inspired a lot of conceptual and practical ideas of *Interplaying*.

Camille Utterback, the artist of the *Text Rain*, designs the technology to build a system for human interaction, not human-machine/computer interaction. She brings human physicality and bodies back into social experience and real life by reforming the relationship to technology.³⁹ Through her video-based interfaces, she encourages many users and audiences to create social spaces focusing on human to human interaction within the real environment.⁴⁰ Utterback's work explores "the continued relevance and richness of the body in our increasingly mediated world."⁴¹

For example, in her work *Text Rain* (with Romy Achituv), Utterback uses the letters from the text of a poem projected onto a screen. *Text Rain* works like this: Letters, like raindrops, swirl down in a bowl of Alpha-Bits cereal, raining on the spectators and a video camera feeds footage of any spectators present onto the same screen.⁴² Furthermore, the spectators' movements (that are captured by the cameras and appear on the screen) are processed by Utterback's computer program.⁴³

Utterback explains that she and her co-worker had been continually amazed watching people engage with the *Text Rain*: "In order to catch more letters, people have opened umbrellas, stretched scarves between them, and enlisted a series of strangers to hold hands across the screen. In addition, they actively influence the movement of the letters on the screen while physically communicating with other spectators face-to-face."⁴⁴ By playing with responsive text graphics, participants not only enjoy the interaction with the *Text Rain*, but also play together with fellow participants including the strangers.

³⁹ Utterback, Camille. "Designing Systems for Human Interaction, Not Human-Computer Interaction," <http://www.core77.com/reactor/utterback.html>

⁴⁰ Utterback, Camille, "Camille Utterback," <http://camilleutterback.com/> .

⁴¹ Stanford Department of Art & Art History, "Camille Utterback", <https://art.stanford.edu/people/camille-utterback>

⁴² Lee, Edward. "Camille Utterback and the Technology of Interactive Art," *HuffingtonPost Arts&Culture*, May 25, 2011. <http://www.huffingtonpost.com/edward-lee/camille-utterback-and-the-b-775070.html>

⁴³ Utterback, "Designing Systems for Human Interaction, Not Human-Computer Interaction."

⁴⁴ Ibid.

The social dynamic set up by the system is also very open ended. People communicate with each other by turning to talk or connecting gazes through their on-screen images.⁴⁵ They cooperate to try to catch more letters, or joke around, stealing letters from each other. They get amused and laugh together while having fun with the projection. Utterback describes that “far from creating a virtual world in which users are "lost", *Text Rain*, through the virtual space it creates, activates the real space in which it exists.”⁴⁶ The on-screen space created by the *Text Rain* installation encourages participants to move and gesture with their body in the real space.

Another example of bonding through interactive digital art is shown in the movie ‘Big (1988)’. In a huge toy department store, the adult Josh Baskin (Tom Hanks) explains his ideas about toys to MacMillan (Robert Loggia). During the conversation, they step on the huge piano-shaped DDR. As they play the music together with the same installation toy, they emotionally bond better; MacMillan gets to understand the feeling of playing with toy as a kid, which was what Josh has been talking about, and Josh also enjoys the shared experience with MacMillan, learning that he can have fun with the boss he barely clicked with.

Inspired by the *Text Rain* and the piano scenes from movie Big (1988), this project creates the *Interplaying*, which is almost looks like a virtual version of LaunchPad (figure 3.0). The audience is encouraged to play in any kind of way with the program. This shared medium will focus the audience’s attention by giving them a game object to play with in the real environment. Also, by providing several choices of buttons and more than two set ups of installation, audiences are expected to move around the venue (not sitting or standing on the same spot), gaining more opportunities to randomly interact or communicate with other audience at the events. It aims to create more human interaction in the live music events, taking their attention away from the personal digital devices.

⁴⁵ Utterback, “Designing Systems for Human Interaction, Not Human-Computer Interaction.”

⁴⁶ Ibid.

Chapter 3: Design Process of *Interplaying*

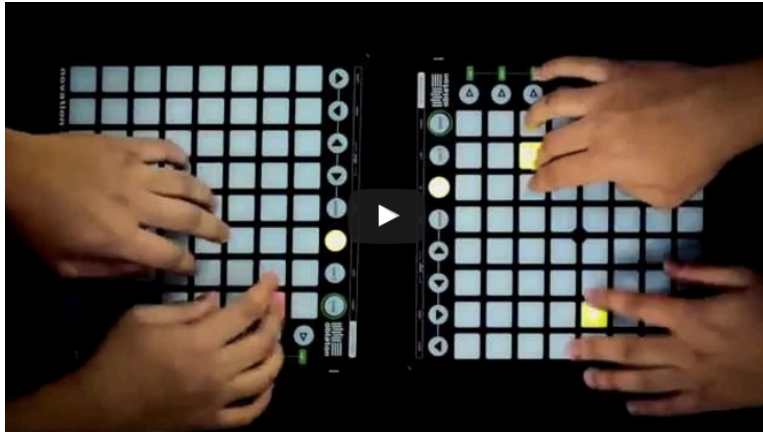


Figure 3.0

This type of modern Launchpad is largely used by musicians, especially DJs, due to its simple mechanism and performative component.

This interactive digital installation is composed of a Unity software program (gaming engine), Leap Motion (hand detection hardware), a PC, projector, screen, and participants to play with this program. Although Unity is mostly used for gaming engine development, it is greatly used for interactive programs as well.⁴⁷ This project chooses Leap Motion instead of Windows Connect or Kinect. Windows Connect may have more sophisticated whole body detection sensors, however, I used Leap Motion to simplify the activity and construct the program easy and intuitive for the audience.⁴⁸ The projector and screen is necessary to send the visualization of the program into the large screen to share with everyone at the venue.

The program's visual image is similar to the shape of Launchpad (figure 3.0), but *Interplaying* has touch buttons in a virtual screen and the visualization can be modified in different ways. When the audience touches a button, each triggers the audio file and changes its color to notify the player that it detected his/her touch. The audio file in each button is a short melody or the beat that is extracted from the main music, which is being played in the background by a musician in a music concert/festival. Each file would be no longer than 15

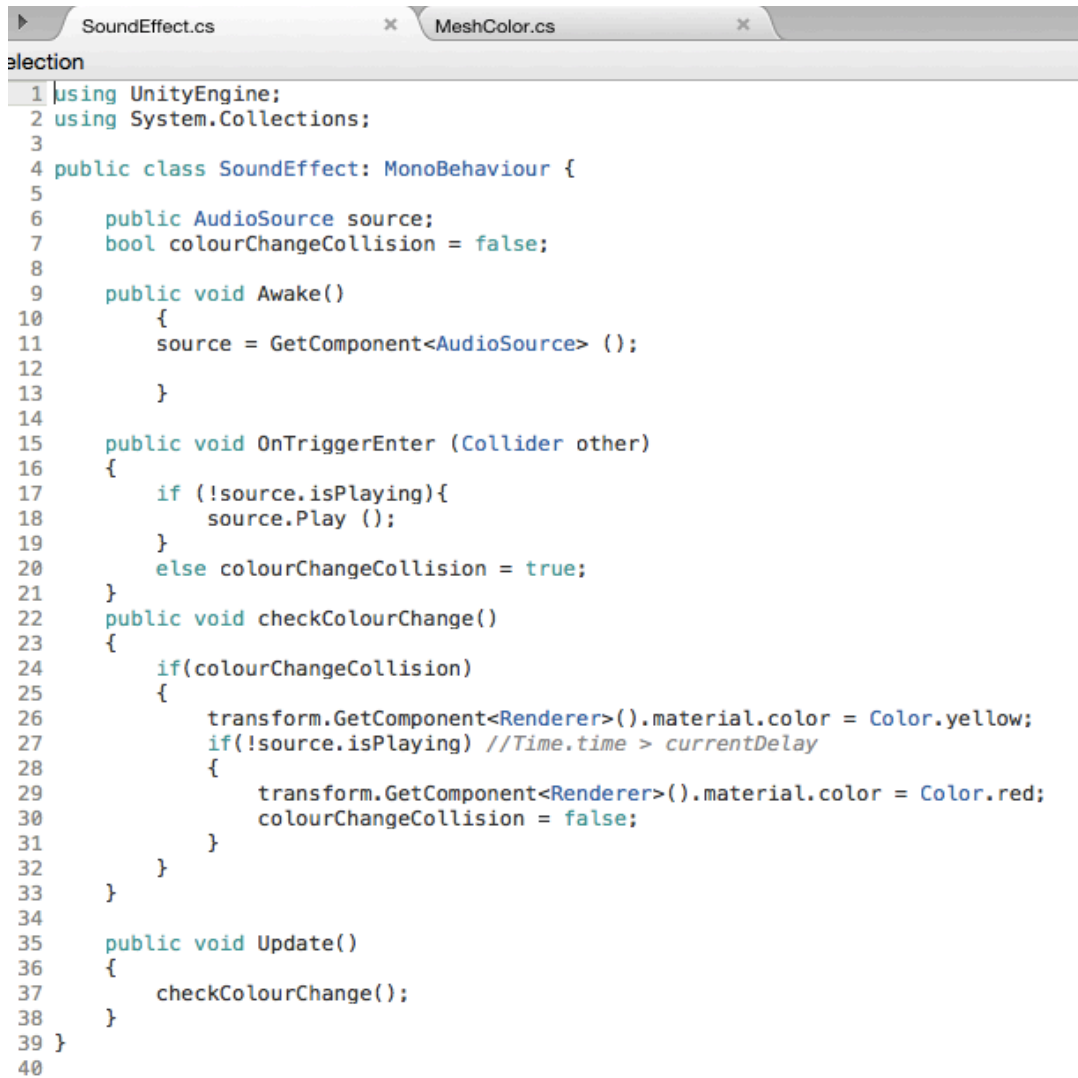
⁴⁷ Unity website: <http://unity3d.com/>

⁴⁸ Leap Motion website: <https://www.leapmotion.com/>

seconds and is different one by one. Audience members are encouraged to treat this as if they are physically playing Rock Band with other participants together live. Since one Leap Motion can handle 3-4 hands, audience members might cluster into a single station. There will be several stations, considering a massive environment and large population of live music events. The goal of the project is to motivate audience members to recognize one another and focus on live interaction happening in the venue, instead of finding connections via virtual world too much during the event.

The current prototype has three setups – each with one laptop and a single leap motion device. Each setup will have different types of audio files – melody with or without vocal, drum beats, and another instrumental sounds extracted from a particular music which would be played in the background.

3.1 Programming



```
1 using UnityEngine;
2 using System.Collections;
3
4 public class SoundEffect: MonoBehaviour {
5
6     public AudioSource source;
7     bool colourChangeCollision = false;
8
9     public void Awake()
10    {
11        source = GetComponent<AudioSource> ();
12    }
13
14
15    public void OnTriggerEnter (Collider other)
16    {
17        if (!source.isPlaying){
18            source.Play ();
19        }
20        else colourChangeCollision = true;
21    }
22    public void checkColourChange()
23    {
24        if(colourChangeCollision)
25        {
26            transform.GetComponent<Renderer>().material.color = Color.yellow;
27            if(!source.isPlaying) //Time.time > currentDelay
28            {
29                transform.GetComponent<Renderer>().material.color = Color.red;
30                colourChangeCollision = false;
31            }
32        }
33    }
34
35    public void Update()
36    {
37        checkColourChange();
38    }
39 }
40
```

Figure 3.1 Screenshot of programming code for *Interplaying* in Unity (The code is based on C# language).

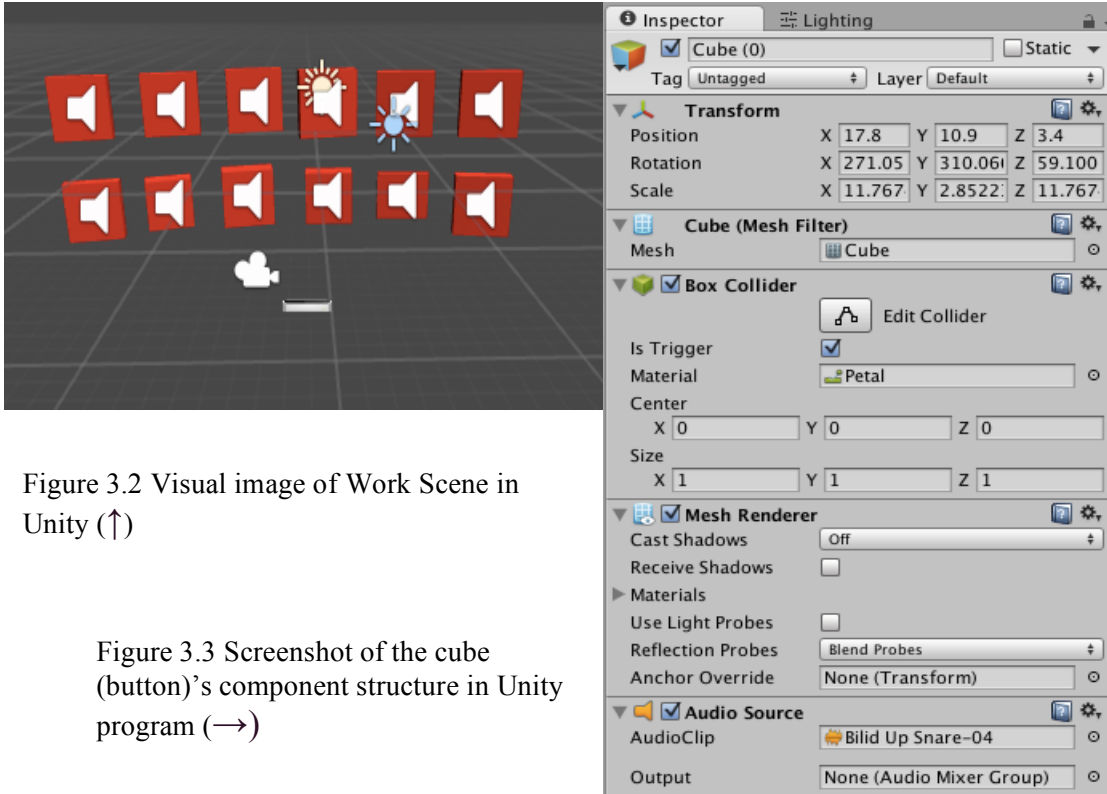


Figure 3.2 Visual image of Work Scene in Unity (↑)

Figure 3.3 Screenshot of the cube (button)'s component structure in Unity program (→)

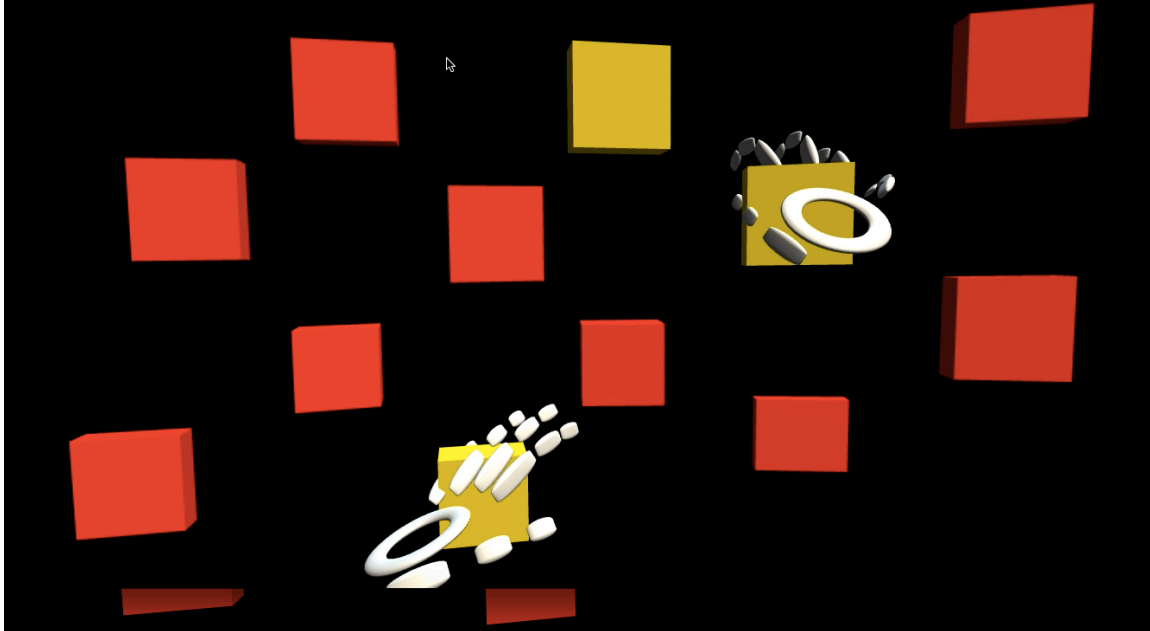


Figure 3.4 Screenshot of developed prototype of *Interplaying* (with design variation)

The most important part of the programming is a making trigger that happens by the audience (user)'s hands. There are two events happening by one trigger per one button in *Interplaying* – playing an audio file and changing the visual image.

To explain the coding process (figure 3.1), **Awake()** brings the audio component embedded in the game object, which is the button in this program. Each button is a cube game object and has its own physicality and rendering. By adding the component of Audio Source to each game object, one can set a trigger in each cube. **OnTriggerEnter()** is a common function used in Unity when there is a collision between two different game objects. In this program, a collision is between the audience's hand, which is detected by Leap Motion, and the cube, which is a virtual button. **!source.isPlaying** checks if the audio trigger in the cube is playing or not. If the cube's audio file has not ended yet after its latest hand contact, **source.Play()** does not play the sound even though there is a new contact. If the audio file is ended after the previous collision, the sound is played again when the program detects new hand contact.

Another trigger is changing the color of the cube to easily notify the audience if the button is currently touched or not to prevent any confusion whether s/he successfully touched the button. **colorChangeCollision** is initially set as false because the collision has not happened until the audience's hand collides with the cube. In the current prototype, the default color of the cube is red. When the audio is played, which means the cube game object is touched, the color of the cube is changed to yellow at the same time. (Each installation set up may change the color of cubes into different ones such as blue, green, cyan, or purple to notify the player the existence and interaction of other participants.) By putting **colorChangeCollision** inside the **OnTriggerEnter()** function, it syncs the collision events of audio and image. When the audio is playing, the collision is true; the color of the cube changes.

In addition, this program had to create **checkColourChange()** function to make a detailed color-changing event. If (**colorChangeCollision**) is true, it means the cube has collided

with the audience's hand; Renderer component of Unity changes the button into yellow. Otherwise, it remains red, the default color, and the condition of collision is set to false.

3.2 Why not alternatives?

Music concert/festival production companies actively use and develop technologies to interact with their audience members and immerse them into the show. In few festivals like *Tomorrowland*, wristbands have been used for several years to enhance the audience experience in music events. Currently, the chip inside the wristband contains the credit card, social media accounts, and ticket information. Its main purpose is the convenience and to reduce the use of mobile devices like smartphones that people carry around and get distracted from the live event environment. Due to its advantage of convenience, mobility, and digital function, concert/festival companies are constantly developing wristbands to project colors. Some prototypes are experimenting to transfer the audience's heart beat into wristband's LED color. With such wristbands, the companies attempt to create immersive experience as well as audience-generated lighting effects in the shows to enhance audience participation. Another common technology used among audience members in the music events is mobile application. It is often used to share the information or make a reservation for the show.



Figure 3.5 Example of wearable technology in live music concerts

However, *Interplaying* deliberately chooses not to use personal or mobile devices to prevent the individual's human-technology interaction with personal devices. Rather, it wants to initiate the communication between audience members at the events. If each individual receives personal devices (like smartphone applications or wristbands) with *Interplaying's* program embedded, there is a risk that audience will again focus on one's own device and be less motivated to communicate with one another.

Another choice is that the installation is stationary, not mobile or movable. If the medium is mobile, it would be hard to recognize the fellow players of the device. Face-to-face communication would be more likely to happen when the audience can directly see and recognize another person who is sharing the experience with him or her.

Moreover, although the visual image of the project is similar to that of Launchpad, it does not use a physical Launchpad. It is because a physical device is hard to embrace a large number of people at the same time. Also, a station with a physical Launchpad will create a traffic in an already crowded venue. The digital detection devices and virtual screens are more capable of capturing a large number of people's activities.

3.3 Expected results/effects

The ideal behavior *Interplaying* wants to generate is a live interaction among audience members. It does not need to be a deep conversation or serious interaction. Eye-contact, head nodding, smiling, and shouting together are enough to bring the audience's attention to face-to-face connection and relationship. This project is not necessarily against the usage of smartphones or cameras. Rather, it aims to bring up the topic of live human interaction and the socialization, which is a great advantage of such live music events that is often forgotten.

Besides the recognition and interaction among audience members, *Interplaying* fulfills other factors that contribute to a positive experience at live music events. According to the research conducted by event management industries, there are specific factors in live music

events that successfully provide memorable experiences to the audience: abundant choices, moments of amazement, shared experiences, the fringe at the heart (interesting experience and social interaction in informal events besides the main attraction), local distinctiveness, positive values.⁴⁹ Among those factors, this program has a great potential to fulfill moments of amazement, shared experience, and the fringe (by installing the project in other booths in the venue).

- Moment of amazement: As there is not much opportunity for audience to actively influence the main product of the show, music, creating the music with the musicians and fellows would be a fresh new, amazing experience. Also, as this kind of installation has never been implemented in a real setting before, it would arouse the audience's curiosity.
- Shared experiences: Socializing is one of the biggest values that festival-goers pursue and enjoy. The shared medium like *Interplaying* provides the opportunity to collaborate and bond with fellow audience members by creating a common subject to play with. It also provides the activity other than recording the show and watching the digital device screen and the stage only, distracting the audience from the virtual activities.
- The fringe: Other minor activities or booths in the event venue engages audience more into the real environment. If *Interplaying* cannot be used in the main stage, smaller stages or different booths are another great options for the installation. It will provide a unique experience to participants.

⁴⁹ Morgan, "Making Spaces for experiences," 309-313.

3.4 Limitation

3.4.1 Technical limitation / Alternatives

One Leap Motion device currently cannot detect more than 3-4 hands at a time and the detection range is quite restricted per device. This specific prototype would not be enough to embrace massive audience members in the shows. However, if there is another hardware in the industry to handle a large number of hands or bodies at the same time, this limitation can be resolved.

Also, it is technically difficult to implement multiplayer systems in a single server (as if one would play online graphic game like *World of Warcraft* with other users in remote places). The process requires a professional computing knowledge to set up network which sends information to one another (host-client servers).⁵⁰ If the program is successfully developed with multiplayer network server, the program can have various versions of music including Pop, Electronic mix, or Hip-Hop. Each version would have different audio files because each cube needs to incorporate the beats and melodies that are sonically harmonious to each music. In order to prevent the lagging or simplify the network server process, the information that is being shared in the server can be simplified. As the rendering and updating of hand models at each frame in multiple devices may take a lot of time, hand modelling information can be removed. Instead, setting different color changes to each setup's program and sharing that color information would be enough for the audience to know if there are other participants simultaneously playing the program.

There is an alternative in case creating multiplayer network server has failed. Different setups can incorporate different types of audio components. For example, you can program one setup with drum beats, another with vocal files,⁵⁰ and the other one with guitar or any other different sound component.

⁵⁰ More information can be seen at <http://docs.unity3d.com/ScriptReference/Networking.NetworkManager.html>

3.4.2 Experiential limitation

The reactions of audience members are expected to be diverse. Some people may not want to be disturbed during their live-music-listening experience. Others may focus on this program only and do not care about surroundings or other players. Those obstacles should be constantly observed and improved by upgrading the system or changing the way of installation. If *Interplaying* is not appropriate to implement in the massive scale of the main stage and cannot satisfy every audience, this can be installed in smaller booths or stages in the venue. Also, if audience members only stare at the program and the screen, *Interplaying* should incorporate more directions or competitive gaming elements in order to lead them recognize other players.

In addition, the interaction can be considered as a short spark. However, even such short eye contacts or human gestures are significant components of human relationships. Also, the depth of communication depends on the will of the audience and cannot be forced. *Interplaying* only provides the initiative and motivation to have human-human interaction through a playful activity.

Chapter 4: Conclusion

Interplaying ultimately seeks to create social connectivity and bonding opportunities among audience members in music concerts/festivals in real life. It regards the socializing activity as the most distinctive trait from other music-listening experience. Moreover, the project attempts to show the potential of technologies to connect people in real life together. Against the negative or cynical sentiment that argues technology is decreasing human-human contact, the project wants to provide alternative perspectives of using the technology to generate more human-human connectivity. Through this idea, it encourages the further investigation about how to use technology to bring a community tighter in real physical environment, rather than just focusing on the virtual world or virtual relationships.

4.1 Future Approaches

There are several future topics that can be derived from this project idea: challenging the dominant power of artists against the audience, gamifying the program, and focusing on ‘social’ aspects of digital technologies in live music events.

4.1.1 Challenging the conventional audience and artist relationship through audience participation

Interplaying has a great potential to challenge the conventional relationship between the artist and the audience. The existence of a main human protagonist – the musicians, which are sometimes even described as godly figures in music events – is another major difference from community festivals. By allowing audience members to actively contribute to the soundscape of the musician’s performance, *Interplaying* can make the audience more active participants of the show.

A large number of interactive media artworks were developed to challenge the concept of passive spectators in the art world, especially in music and performing arts. Twentieth century composer, John Cage, was eager to change the relationship of performer and audience, believing that music cannot be separated and detached from its listeners and from its context: the listeners' experience of the work was essential to the music itself.⁵¹ For him, creating music was a process that was initiated by the composer or performer, but could only be completed by the audience. Through his artworks such as *4'33'* and *Theater piece No.1*, he wanted to create inclusive, participatory art in which the audience "can sit quietly or make noises...whisper, talk and even shout."⁵² In Jaques Attali's vision, the future audience members will not only listen to music but create their own music for their own pleasure, and no distinction between the musician and the audience is made: a world in which people define music for themselves to compose, perform, and serve as the audience for that music.⁵³ In *Multimedia*, the computer-based artwork of Moholy-Nagy explores to challenge the conventional relationship between the spectator and the performance, attempting to transform the passive spectators to creative and active participants.⁵⁴ In the project, he tried to change the audience's total behavior through multimedia artifacts and create a new, interactive performing entertainment.

Along with these media artworks, *Interplaying* steps forward to generate music listeners/spectators into active participants. Although there is the limitation in the current project that sonic choices and movement range can be restricted by the music, venue, or technical ability, the process of the audience directly contributing to the sounds would be a completely new

⁵¹ Cage, John. *Silence: Lectures and writings by Jon Cage*, (Middletown, CT: Wesleyan University Press, 1984), (cited in Troyer 2012).

⁵² Cage, John. "Diary: Audience 1966, A Year From Monday" in *Multimedia: From Wagner to Virtual Reality*, ed. Packer, Randall, and Ken Jordan (New York: Norton, 2001), 91

⁵³ Attali, Jaques. *Noise: The political economy of music*, (Minneapolis: University of Minnesota Press, 1985), (cited in Troyer 2012).

⁵⁴ Laszlo Moholy-Nagy. "Theater, Circus, variety, Theater of the Bauhaus (1924)" in *Multimedia: From Wagner to Virtual Reality*, ed. Packer, Randall, and Ken Jordan (New York: Norton, 2001), 16

experience both to the musician and to the audience. Also, such participation will create a unique and personalized show every time.

4.1.2 Possibility of developing with gaming components and perspectives

This interactive digital installation has several characteristics that are similar to those of games. Some components of *Interplaying* have high potential to be developed into games. In the future, especially if this program does not engage audience members enough or motivate live social interaction as expected (when it is implemented in actual live music events), the program can be further developed by incorporating game aspects. The way games achieve their goal of attracting more players into the game environment seems largely applicable to attract people to play *Interplaying* and thus, create more live social interaction in a specific setting. Jane McGonigal, Ph.D, the Director of Game Research and Development at the Institute for the Future, explains about the motivation and result of playing games in conjunction with social connection and happiness.

Before talking about the application of games' tactics of attracting more players, there are few similarities between live music events and games that would make such application easier. Similar to the fact that games are "the quintessential autotelic activity", audience members voluntarily visit live music events by their own will, such as wishing to see musicians in real or to experience what it is like to have fun in public music events with a large number of people.⁵⁵ Another similarity is the presence of strangers. Both in live music events and many types of games, one is surrounded by strangers and shares similar activity with them.

According to *Reality is Broken* written by McGonigal, psychological motivations that make people play games include intrinsic and extrinsic rewards.⁵⁶ In order to keep participants engaged, after they voluntarily choose to play the game, major intrinsic and extrinsic rewards are

⁵⁵ McGonigal, Jane. *Reality Is Broken: Why Games Make Us Better and How They Can Change the World*, (New York: Penguin, 2011), 50

⁵⁶ McGonigal, *Reality Is Broke*, 49-51.

often incorporated in the gaming process. Among several intrinsic values, the most relevant ones with live music events are “social connection” of building bonds/ sharing experiences/ accomplishing things together and “meaning” to be part of something larger than oneself.

“Our happiness is completely and utterly intertwined with other people: family and friends and neighbors...Happiness is ... Connective tissue. The greatest source of happiness is other people”

– “*The Geography of Bliss*”, Eric Weiner⁵⁷

The polls that were conducted to game users have showed that the players enjoy sharing their virtual environment. Again, one of the major motivation/satisfaction factors of visits to live music events is socializing. Acknowledging and being aware of others - social presence – make people’s collective activities more valuable and meaningful to their given environment. It often refers to a “very casual form of social interaction” including a smiling face, handshake, slight touch, or eye contact; it creates the opportunity to expand one’s social network, feeling of inclusion in a social scene, access to interact with others if needed.⁵⁸

While *Interplaying* already incorporates such social interaction/connection aspect, it may lack “meaning” and extrinsic rewards. “Meaning” in the game is the feeling that the participant is part of something bigger, doing something that matters beyond one’s own life. As humans usually connect the meaning in a large-scale social context and a larger entity, meaningful actions can have significance to friends, family, and even a much larger scale of community or organization that they are part of.⁵⁹ Considering the value of meaning, if *Interplaying* incorporates more gaming aspects and decides to generate a reward that is realistically valuable to the events or even after the events, theoretically more participants would be engaged to the activity.

⁵⁷ McGonigal, *Reality Is Broke*, 80.

⁵⁸ *Ibid.*, 90.

⁵⁹ McGonigal, *Reality Is Broken*, 97.

People need extrinsic rewards as well. Extrinsic rewards in gaming community are not necessarily a real money or fame, but a recognizable material within the participants' environment or community. Assuming that a typical and common characteristic of audience members in live music events would be their interests in music, creating the music file out of their activity playing the program would be an option. Even considering the valuable "meaning" in the context of live music events, it still seems significant to include musical component to the core activity.

Implementing such strategies of games in a real life scale of *Interplaying* would be a very interesting future approach. If games have connected people inside the virtual web environment (without any hassle to actually meet up to have fun), the game strategies in *Interplaying* encourage the audience to play games with one another, who are already physically enjoying live music events together in a real environment. *Interplaying* with such strategies would be expected to attract more audience members and provide more opportunities of social experience in the events.

Types of prizes/feedback/challenges that would normally encourage gamers would be modified based on the characteristics of the musician, event, and the environment. Considering the "meaning" and extrinsic rewards that can be created from *Interplaying*, one option would be recording the sound generated by the participant's *Interplaying* activity and sharing it with public and musicians. Inspired from Seo Tai-ji's open source examples, the audience's activity with the virtual Launchpad can be recorded and shared with the public or musicians. In 2014, Seo Tai-ji, the prominent previous rock band singer and current multi-talented musician in South Korea, released stem files (audio files that contain a track split into several musical elements) of title track 'Christmalo.win' of his new album 'Quite Night' for free on Soundcloud website.⁶⁰ He gained a lot of feedback and new creative songs from his fans and other musicians. If the musicians incorporate few mash-up files that are generated through *Interplaying* in their live set

⁶⁰ More information can be found at <https://soundcloud.com/seotaijicompany>

or even communicates with their fans by acknowledging such files, that would create the next level of interaction in live-music-event community.

4.1.3 More social technologies to bring people back to real life connection

We can go to music concerts and festivals thanks to the development of technology – transportation and online information about the events. However, even before then, the community festivals were there for people to celebrate, play, and have fun together. While celebrating the benefits of technologies, we should not forget the human aspects of live music events and value the socialization with people who share similar taste, emotion, and experience with us right now at the moment.

“Now we all need to focus on the many, many ways technology can lead us back to our real lives, our own bodies, our own communities, our own politics, our own planet. Let's talk about how we can use digital technology, the technology of our dreams, to make this life the life we can love.”
– Sherry Turkle⁶¹

While there are still various concerns about the relationship between technology and human, technology is constantly being advanced. If we cannot separate us entirely from technology, we should consciously use it, instead of being controlled by it. In live music events, which is a very human-oriented experience with full of emotion and physicality, we should be especially keen to acknowledge what we can enjoy at the moment and how to use technology in smart and beneficial ways. To continue the fundamental satisfaction that we gain in these events, we should constantly research many ways technology can lead us back to our real lives.

⁶¹ Transcript of "Connected, but alone?", Ted Talk by Sherry Turkle: "Connected, but alone?"

Acknowledgements

I am grateful for my family's endless support and enthusiasm despite the long distance between New York, U.S.A. and Gyeong-gi do, South Korea. I would like to give special thanks to my mother who has not only supported and advised me in every decision I made, but also always encouraged me to study computer and technology-related approaches (which this project mainly investigates). I would also like to thank my relatives in New York, North Carolina, Boston, and California for allowing me to stay with them whenever I visited the area and supporting my adventure and research all around the States. Thanks to my good friends from middle and high school who have always given me confidence about my path and inspired me with their endless love. I am also thankful for my college friends and roommates who have continuously encouraged my adventure and given me endless help and love in general. Special thanks to Sophy Wu for her endless support, praise, feedback, and inspiration – nothing would have been possible without her.

This senior project could not have been accomplished without my amazing professors and Media Studies major students in Class of 2016 who taught me the ways of critical thinking and multidisciplinary perspectives of art, technology, music, culture, and media. I would like to thank all the professors who have taught me, including Dara Greenwood, Denise Walen, Marsha Mark, Stephen Jones, and William Hoynes. All classes and conversations I shared with them made me a multidisciplinary person with passion in art, computer, and media.

Words cannot express my appreciation for my thesis advisors and my thesis buddy. I am truly grateful to have Professor Justin Patch and Thomas Ellman as my advisors and supporters. Since they never stopped pushing and questioning my idea, it became realized and constructed through this thesis and project. Their passions and curiosities with multiple perspectives have inspired me in every possible way, encouraging me to challenge and develop my ideas to their full extent. Many meetings and conversations with those two made my project's content much richer and deeper. I am also extremely thankful for Connor Martin who has been my thesis buddy throughout my senior year. He not only helped me to refine my project more than anyone else, but also inspired me with his critical ideas and inputs from an outside perspective.

Thanks to the VR Lab program people – Dakota, John, Rehmat and other co-participants who always motivate me with their brilliant creativity, passion, and technical skills. Special thanks to Talal and John for generously lending their Leap Motions for my prototype of *Interplaying*. Thanks to Vassar's administrative offices and fellowships for their funding support that allowed me to broaden my perspectives by visiting the VR Lab program as well as other inspirational events.

Thanks to the MIT Media Lab and NYU ITP programs and their website sources – every source and project I found in their websites were amazing and inspiring. Thanks to all the authors and publishers that I cited in this paper because their previous research made this project possible. Thanks to the Unity and Leap Motion developers for providing amazing technologies that helped me develop a prototype to implement my idea through *Interplaying*.

Last but not least, thanks to God for guiding me in every step.

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