Spring 5-2018

# Facilitating Meaningful Interpersonal Connections Through a Virtual Space

Gene Herrschaft
*University of Maine*

# FACILITATING MEANINGFUL INTERPERSONAL CONNECTIONS THROUGH A VIRTUAL SPACE

by

Gene Herrschaft

A Thesis Submitted in Partial Fulfillment
of the Requirements for a Degree with Honors
(New Media)

The Honors College

University of Maine

May 2018

Advisory Committee:

Aaron Boothroyd, Adjunct Professor of New Media, Advisor
Dr. Nicholas Giudice, Professor of Spatial Informatics, Co-advisor
François Amar, Dean, Honors College
Adam Crowley, Ph.D. Associate Professor of English, Husson University
Dr. Jennie Woodard, Preceptor, Honors College, Instructor of WGS and CMJ

# ABSTRACT

Interactive virtual experiences are known to be a viable medium to elicit emotional reactions from their users and to provide meaningful experiences. However, establishing meaningful interpersonal connections through interactive experiences can also be difficult, due to the toxic online environments that can stem from anonymity, and a general online hostility towards women or other traditionally under-represented groups. This project aims to create a welcoming online virtual space that gives users the opportunity to establish meaningful interpersonal connections with one another. These connections are facilitated by encouraging users to work together, interact with each other, and talk about themselves while in the virtual space. These connections are made more impactful by utilizing Virtual Reality, which allows for intuitive and immersive communication through gestures and body language. This paper describes the process of creating a welcoming virtual space, specifically focusing on the technical challenges of building a networked virtual reality experience, the design process in promoting positive interaction between users, and the implementation of accessibility features for both the VR experience itself and the social situations it affords.

TABLE OF CONTENTS


INTRODUCTION 1

Project Description 2

PROJECT DESIGN 4

Puzzle Design 4

Conversation Design 5

INTERPERSONAL COMMUNICATION RESEARCH 7

Intergroup Communication 7

Designing for Meaningful Relationships 7

ACCESSIBILITY RESEARCH 9

Physical 9

Social 10

TECHNICAL CHALLENGES 12

Funding 12

Networking 13

Optimizing Workflow 14

FUTURE TESTING, CONCLUSION 16

Future Testing 16

Conclusion 16

BIBLIOGRAPHY 18

APPENDICES 20

APPENDIX A: CONVERSATION PROMPTS 21

APPENDIX B: SURVEY QUESTIONS 23

AUTHOR'S BIOGRAPHY 26

# INTRODUCTION

On January 24th, 2017, UploadVR published an article talking about the then "Fastest Selling VR Game," *Arizona Sunshine*, which is a first-person zombie shooter. VR has incredible potential in terms of immersion and interactivity, so it's really unfortunate that its most popular use is based around shooting something with a gun. This prompted the original concept of this project - something that could justify its use of VR by providing a worthwhile nonviolent experience that would not be possible through another medium. Video games and other interactive virtual experiences are known to be a viable medium to elicit emotional reactions from their users and to provide meaningful experiences. However, establishing meaningful interpersonal connections through interactive experiences can be difficult, due to the toxic online environments that can stem from anonymity, and a general online hostility towards women or other traditionally under-represented groups.

The interactive experience created during this project aims to create a welcoming online virtual space that gives users the opportunity to establish meaningful interpersonal connections with one another. These connections are facilitated by encouraging users to work together, interact with each other, and talk about themselves while in the virtual space. Virtual Reality is utilized in this project to make connections more impactful by providing intuitive and immersive communication through gestures and body language. This paper describes the process of creating a welcoming virtual space, specifically focusing on elaborating the technical challenges of building a networked virtual reality experience, describing the design process in promoting positive interaction between

users, and detailing the implementation of accessibility features for both the VR experience itself and the social situations it affords.

The main component of this thesis project is the application that was built between Fall 2017 and Spring 2018. This document serves as an artist's statement, and is included with a video showcasing the application's functionality, and a compiled executable.

## Project Description

This project is a VR experience based around social interaction, where users meet another person within a virtual space. They communicate to solve three puzzles using only gestures and body language. Once the two users have had the opportunity to grow closer by working together, they "unlock" the ability to speak with each other verbally. At no point are users able to judge others based on the way that they look, since visual traits are never made apparent through the virtual avatars representing each user. It isn't until the two users establish a working relationship that they get the opportunity to converse, and tell each other about what makes them unique. This is done by the virtual experience prompting both users to share something personal about themselves with the other person, such as the reason that they like or dislike their hometown, or what their best friend is like (see Appendix A for a full list of prompts). Dissociative anonymity, or the lack of a connection between a person's online presence and their offline identity is one of the largest contributors to toxic online behavior, such as rude language and actions [2]. The information that users are encouraged to share with each other within the VR experience is small and intimate to reduce this anonymity, without relinquishing each user's privacy. By learning these small details about each other's lives, users are

presented with the opportunity to bypass “icebreakers” and launch straight into meaningful conversation. The virtual setting means that users can utilize this project to meet and speak with people from entirely different parts of the world, or cultures that they are unfamiliar with. By meeting people with diverse backgrounds that they may not otherwise come into contact with, users can potentially even expand their view of the world.

# PROJECT DESIGN

## Puzzle Design

There are three puzzles that users must solve together before they reach the social portion of the experience. The puzzles were designed to be simple enough that the lack of verbal communication wouldn't be a frustrating hindrance, while still requiring the users to work together to solve them. The first puzzle has two cubes, and two sensors that the cubes need to be placed in. Each user starts next to a cube and a sensor, however their sensor is for the other user's cube. To solve the puzzle, users need to exchange cubes by handing them to each other over a waist-high barrier that cannot be climbed. This puzzle is designed to keep the users physically separated so that they can become comfortable with interacting with objects within the virtual experience, and also with sharing the space with another person.

After successfully completing the first puzzle, a door opens that allows users to walk to the second puzzle area. The second puzzle requires one user to hold down a lever, which activates a ramp for the other user to access a raised platform. The raised platform houses a second lever, which activates a ramp for the first user to access a second raised platform. The second raised platform houses a button that opens a door to the third puzzle area. Unlike the first puzzle area, the second area does not separate the two users. If a user lets go of a lever in the second puzzle, its corresponding ramp will deactivate. Users are required to actively hold the ramps in place for one another. Trust is built by establishing social norms that people can realistically expect other people to abide by [6]. The second puzzle builds trust by halting progression until both users reciprocate an

action that helps one another. The virtual experience is both training users to engage in actions that help the other user, and giving each user the experience of being helped by the other user. This is done with the intention of establishing a positive social norm between users.

The third puzzle is based on timing and communication. This is the most difficult puzzle to complete without voice chat, so it serves as a test of the communication repertoire that the two users have built up over the first two puzzles. There are two pairs of buttons, which control a large pinball table-like apparatus. Users need to control the two "bumpers" of the apparatus to bounce a ball onto a target. Each pair of buttons has one button for the first bumper, and one button for the second bumper. Each bumper will only activate if both of its corresponding buttons are held down at the same time. To solve this puzzle, users need to coordinate the timing of their button presses with each other. If the ball misses the target, it is reset so that users can try again.

## Conversation Design

When designing the social portion of the project, I was faced with the challenge of encouraging users to share personal information without making them uncomfortable. In 2015, the New York Times wrote about "The 36 Questions That Lead To Love," a series of questions that are designed to make strangers become comfortable with one another by asking a series of questions that gradually get more and more personal [7]. These 36 questions are divided into three different "sets," the first set being the least personal and the third set being very intimate. I really liked the idea of dividing my conversation prompts into similar sets, and allowing users to choose questions from the set that they were most comfortable with. I put together two sets using a combination of

my own prompts and prompts from the first two sets of the 36 Questions (I excluded the third set because I didn't want the social portion to be inherently romantic) [See Appendix A for the full list of prompts].

In the application, five prompts are displayed to both users, three of which are randomly selected from Set 1 (less personal) and two from Set 2 (more personal). The set that each prompt is from, and the fact that the sets exist at all, is not made apparent to the users. I considered showing each user different prompts so that it wouldn't be obvious if one user didn't want to answer a certain prompt, however Dr. Jennie Woodard of Women's, Gender, and Sexuality Studies proposed having both users see the same prompts, but also have an ability to clear the prompts and replace them with another five. This allows for a situation where users choose together to refresh the prompts, which could potentially strengthen their connection.

## Intergroup Communication

Intergroup communication is the theory that most interpersonal interactions are influenced more by individuals' perceived social groups than their actual individual traits [14]. These social groups can be related to age, gender or ethnicity. Previous studies have determined that prejudice between individuals who identify from different groups can be reduced by using digital media, including video games, as a mediator between users [5]. My project aims to utilize this finding by requiring users to engage in positive interactions with one another before giving them the chance to make their perceived social group apparent, or make judgements about the social groups of other users. Online interactions of this nature have been shown to increase social tolerance toward users from other cultures [10].

## Designing for Meaningful Relationships

A game's success in facilitating meaningful friendships is not just based on its users, but also its design. Daniel Cook's talk at Game Developers Conference 2018 on this subject proposed that four of the main factors that contribute to meaningful friendships are proximity, similarity, reciprocity and disclosure [6]. In my project, users' proximity is gradually increased as they progress through the virtual experience, starting with the two users separated in two large areas and ending with the users together in a more intimate space. Similarity is conveyed through the shared user goals of solving each puzzle. Reciprocity comes from each puzzle having two main stages, with each stage giving each user a chance to play an active role in solving the puzzle (ex. User 1 holds up

a ramp for User 2, which allows User 2 to hold a ramp for User 1). Disclosure is encouraged by the application providing conversation prompts to users once they are given the ability to speak with each other.

# ACCESSIBILITY RESEARCH

## Physical

When designing an application for VR, I realized that I had to take into account the fact that basic movement would be enough to make many users nauseous. This project is based around encouraging people to be inclusive, so it would be counterintuitive to have the project itself exclude certain users. Every interactable object throughout the puzzle section of the VR experience is marked by one of two indicator colors. The two colors are different to indicate that two users are required to participate to solve each puzzle. One of the first accessibility measures included was changing the indicator colors throughout the application to colors that would be easily distinguishable by colorblind users. By using these colors, the indication is preserved for both colorblind and non-colorblind users. I used colors selected by Karen Stevens, the accessibility lead at video game publisher Electronic Arts' sports division, who consulted with colorblind users to create a distinct palette of colors that still work well together [8]. All interactable objects are placed to be within reach regardless of whether users are standing or sitting. Other accessibility features that I researched include snap-turning and fade / blink movement [12], and field-of-view modification [9]. Many users experience nausea or motion sickness in VR from their brain trying to reconcile the visual input of their body moving against the physical perception that they are staying in place [9]. Snap-turning, which forces users to turn in large increments (usually 15, 30, or 45 degrees at a time), helps to reduce users' visual perception of their body turning [12]. There are many alternate locomotion systems that implement the same concept, including walking-in-place

detection, which moves users only when they act out the motion of walking [13], or fade / blink movement, which quickly fades users' view to black before moving them to their desired position [12]. Field-of-view modification would allow users to move normally using the thumbsticks on the controllers, but reduce their peripheral vision while moving, which can also reduce nausea [9].

## Social

Comfort and accessibility settings specifically for social interaction were not included as goals in the original pitch of this project, but as I spent time developing the social portion of the project it became more and more apparent that they could be beneficial. Users can have their personal space invaded through VR in a way that isn't possible when playing on a normal screen. I spent time researching social accessibility strategies that have been successfully applied in other social VR applications. One of the most prevalent social comfort settings is personal space enforcement, which can hide and mute other users if they get too close [11]. This feature can be extended into an easy way to mute the other person's voice during the social portion in case either user becomes uncomfortable. I'm aware that there are some people that are most comfortable communicating online by slightly pitching their voice up or down, as it more closely matches the way that they want to express themselves. Allowing these users to slightly modify the pitch of their voice could lead to them being more comfortable with self-expression, which in turn leads to users being more talkative during the social section of the application. This setting would need to only allow for a small amount of modification, or else it could lead to anonymizing users even more. Dr. John Suler's 2004 study *The Online Disinhibition Effect* [2] shows that when a user's online presence cannot be

directly linked to their real identity, they will feel more comfortable being rude to others. This would make the social environment in the VR application less welcoming for personal expression, and hurt the project's goal.

# TECHNICAL CHALLENGES

## Funding

Presently, virtual reality technology is very difficult to work with due to the high paywall both for the VR hardware itself and the additional hardware required to use it. The first semester of this project was largely spent on fundraising through writing grant proposals. Writing these proposals forced me to refine and articulate a clear pitch for the project, which will be important in future professional roles, where I will need to effectively communicate ideas to coworkers. This also gave me the experience of doing the footwork by arranging meetings with faculty members representing the departments from which I was requesting funding. I built a computer for the first time, which meant selecting parts that were powerful enough to support VR, while also being compatible with each other.

To get all necessary funding, I needed three different grants approved: The Honors College Charlie Slavin Research Fund, The College of Liberal Arts and Sciences Research and Creative Activity Fellowship, and the New Media grant. While I was approved for all three, it was a really big risk to count on all of them being approved (a risk that I wouldn't take again), and since all grants need to go through the process of passing through a chain of administration before they can be approved, it wasn't until finals week of the first semester that I finally got all of the materials. I worked very hard to secure funding for this project, and while I did end up getting it, I'm not sure that it was worth losing an entire semester of development.

## Networking

During the pre-production phase before I got the materials, I focused on learning how to work with the Unity networking system. I built a non-vr prototype that taught me how to code for responsiveness when handling networked objects that are affected by physics. In a networked environment with two users, there are three entities that need to be accounted for: the two users and a "server," which acts as a mediator between them. Each of these three entities have their own "instance" of the virtual environment and all objects within it. By default, the server has authority over everything in all instances. This means that all objects in each user's instance will synchronize their positions and rotations with those same objects on the server's instance. From here, users can be given authority over themselves, meaning that user 2 and the server's representations of user 1 will match user 1's position and rotation from user 1's instance. If a user bumps into an object, their position is sent to the server, the server registers the bump, and then the server transmits the bumped object's new position to both users. The time that it takes for objects to synchronize between instances using this method can be up to one second, possibly longer depending on the quality of each user's network connection. If every action in a networked application needs to be handed back and forth between entities on the network, there will always be a noticeable delay between input and reaction. This delay can be reduced, but never completely eliminated, and minimizing the delay too much hurts the overall performance of the application. Performance is especially important when developing for VR, as poor performance will likely make users motion sick [9].

Optimizing both responsiveness and performance was the largest challenge in this project's implementation of networking. Many solutions that I tried were effective, but only for one of the users, giving the second user a poor experience. The solution that I eventually decided on was dynamically assigning the authority of objects to users as they interact with them. When a user picks up an object, their instance of the object becomes the version that both the server and the other user synchronize to. This means that users do not experience a delay in the object's position or rotation if it is in their hand. While the object in other instances may be slightly behind, this isn't noticeable to the other user. Users retain authority of objects until they are interacted with by the other user, which allows users to throw objects and have them react naturally.

## Optimizing Workflow

When developing an application in Unity that isn't networked or in VR, testing the application after making changes only requires waiting for the scripts to compile and clicking play. When testing a networked game, an additional wait is added from needing to build the project into a standalone application, then connecting it to the build running in the Unity editor, to simulate two different users on the same computer. In addition to this, when testing a VR game, the headset needs to be put on during every test and taken off when switching back to editing. None of these individually take very much time, but they add up, and waiting up to a minute between deploying a fix and getting to test it can break development flow. To solve this, I put together various testing configurations in Unity that allowed me to rapidly test without going through all of these steps. By building the options to test VR features without connecting to a network lobby, test networking features without needing to put on the headset, and test puzzle mechanics without

needing to create an online room, I was able to fix, iterate and improve features much faster, without losing momentum. The work that went into making these custom configurations does not provide a material benefit to end users, but the time and productivity that it provided improved the overall quality of the experience.

# FUTURE TESTING, CONCLUSION

## Future Testing

The main research component of this project was in learning new technologies and practicing new skills, and this acquired knowledge was applied to researched designs throughout the VR application. While the most difficult technical challenges of building a networked VR application were solved, this means that empirical user testing did not fit within the logistic scope or the timeframe of this project. Despite this, I have designed what that testing would look like. The study would run two participants at the same time, in different rooms. There would be an intake and outtake survey before and after they use the VR application. The intake and outtake surveys are attached as Appendix B. The intake survey's primary goal is to gather information on each participant's feelings towards meeting new people, their perceptions of cultures different from their own, their feelings towards online hostility, and previous experience with online games and virtual reality. The outtake survey is designed to determine whether the VR application was able to incubate a genuine interest in another person's life that was not present before. It starts by asking which aspects of the application were most uncomfortable for participants, to see if they had more trouble with the project's design or the VR technology. The survey goes on to ask questions about the nature of the conversation that participants engaged in, and whether it left a positive impression on each participant.

## Conclusion

I came to the University of Maine without any programming knowledge, and learning it within the context of building games and interactive experiences has been a

personal challenge due to the lack of a distinct program focusing on this topic. Building a networked VR application was daunting both because of this, and because I lacked extensive experience in either VR or networking development. I did, however, have lots of experience in learning new systems, which is the most prominent skill that I've gained from my time at UMaine. I'm proud to say that most of the technical facets of building the VR application were completed. Building VR interactions, writing networking code, and implementing voice chat all provided me an understanding of how these systems are constructed, and showed me various methods of implementation. All of these systems are implemented and functional in the final VR application. The basic understanding of these systems that I gained from this project will definitely be useful in my future work. If given more time, the project would benefit from more user testing and formal research. I'm disappointed that these didn't fit within the current project's scope, but I'm glad that I have something functional to show for the work that I put into the project.

BIBLIOGRAPHY


(1) Hazlett, Richard L. 2006. “Measuring emotional valence during interactive experiences: boys at video game play.” In Proceedings of the *SIGCHI Conference on Human Factors in Computing Systems* (CHI '06), Rebecca Grinter, Thomas Rodden, Paul Aoki, Ed Cutrell, Robin Jeffries, and Gary Olson (Eds.). ACM, New York, NY, USA, 1023-1026.

(2) Suler, John. “The Online Disinhibition Effect” *CyberPsychology & Behavior*. July 2004, 7(3): 321-326.

(3) Lucas, Kristen. Sherry, John L. “Sex Differences in Video Game Play: A Communication-Based Explanation” *Communication Research* Vol 31, Issue 5, pp. 499 - 523. June-30-2016.

(4) Feltham, Jamie. "'Arizona Sunshine' Might Be The Fastest-Selling VR Game." *UploadVR*, 24 Jan. 2017. Web.

(5) Wertley, Chad. “Identifying With the ‘Other’ Through Digital Media: a Comparison of Online Videogames, Text and Video in Facilitating Positive Intergroup Contact and Reducing Bias” University of Nebraska-Lincoln.

(6) Cook, Daniel. “Designing Friendship - Tools to Growing Meaningful Friendships in Online Games.” Game Developers Conference. Game Developers Conference, 22 Mar. 2018, San Francisco.

(7) Jones, Daniel. “The 36 Questions That Lead to Love.” The New York Times, 9 Jan. 2015, www.nytimes.com/2015/01/11/fashion/no-37-big-wedding-or-small.html.

(8) Stevens, Karen. “I'm Currently Having These Cards Delivered to Everyone in the Studio. It Took Many Iterations of Colors before Those in the Studio with Protanopia, Deuteranopia, and Even the Rare Tritanopia, Could See All Colors Distinctly, Yet Keeping the Shades Close to Colors Already Favored. pic.twitter.com/KeNFojOeNo.” Twitter, Electronic Arts, 27 Feb. 2018, twitter.com/ea_accessible/status/968592657848193024.

(9) Fernandes, Ajoy S, and Steven K Feiner. Combating VR Sickness through Subtle Dynamic Field-Of-View Modification. www.cs.columbia.edu/2016/combating-vr-sickness/images/combating-vr-sickness.pdf.

(10) Kobayashi, Tetsuro. “Bridging Social Capital in Online Communities: Heterogeneity and Social Tolerance of Online Game Players in Japan.” Human

Communication Research, vol. 36, no. 4, 2010, pp. 546–569., doi:10.1111/j.1468-2958.2010.01388.x.

(11) Iachini, Tina, et al. “Body Space in Social Interactions: A Comparison of Reaching and Comfort Distance in Immersive Virtual Reality.” PLoS ONE, vol. 9, no. 11, 2014, doi:10.1371/journal.pone.0111511.

(12) “Movement in VR.” Unity Technologies, unity3d.com/learn/tutorials/topics/virtual-reality/movement-vr.

(13) Tregillus, Sam & folmer, eelke. (2016). VR-STEP: Walking-in-Place using Inertial Sensing for Hands Free Navigation in Mobile VR Environments. 10.1145/2858036.2858084.

(14) Jones, Liz, and Bernadette Watson. “Intergroup Communication.” *Oxford Bibliographies Online Datasets*, 2013, doi:10.1093/obo/9780199756841-0122.

# APPENDICES

## APPENDIX A: CONVERSATION PROMPTS

Questions are sampled from "The 36 Questions That Lead to Love," [7] except for those marked with an asterisk (*).

**Set I (Less Personal)**

1. Given the choice of anyone in the world, whom would you want as a dinner guest?
2. Would you like to be famous? In what way?
3. What would constitute a "perfect" day for you?
4. For what in your life do you feel most grateful?
5. If you could change anything about the way you were raised, what would it be?
6. If you could wake up tomorrow having gained any one quality or ability, what would it be?
7. *What do you wish you could do again for the first time?
8. *How did you decide on a name for your pet? If you don't have a pet, what kind of pet would you like to have?
9. *What is an essential part of your daily routine?
10. *What do you like about your hometown?
11. *What's something that you're looking forward to?
12. *What is your dream job?
13. *What is your favorite hobby?

APPENDIX A: CONVERSATION PROMPTS (CONT'D)

Questions are sampled from "The 36 Questions That Lead to Love," [7] except for those marked with an asterisk (*).

**Set II (More Personal)**

1. Take four minutes and tell the other person your life story in as much detail as possible.
2. If a crystal ball could tell you the truth about yourself, your life, the future or anything else, what would you want to know?
3. Is there something that you've dreamed of doing for a long time? Why haven't you done it?
4. What is the greatest accomplishment of your life? Or, What's the last thing you've done that you were proud of?
5. What do you value most in a friendship? / What do you like most about your best friend?
6. What is your most treasured memory?
7. If you knew that in one year you would die suddenly, would you change anything about the way you are now living? Why?
8. How close are you to your family? Do you feel your childhood was happier than most other people's?
9. *What motivates you in everyday life?
10. *What is something that you enjoy, but you don't think many other people do?

APPENDIX B: SURVEY QUESTIONS

**Intake Survey (Questions answered on a scale of 1 to 5)**

- How much experience do you have with using virtual reality? **(1 - No experience | 5 - Very much experience)**
- How much experience do you have with playing online video games? **(1 - No experience | 5 - Very much experience)**
- How often do you interact with other people online? **(1 - Almost never | 5 - Very frequently)**
- How often do you meet new people, online or otherwise? **(1 - Almost never | 5 - Very frequently)**
- Do you enjoy meeting new people? **(1 - Strongly dislike | 5 - Strongly enjoy)**

APPENDIX B: SURVEY QUESTIONS (CONT'D)

**Outtake Survey**

- Which aspects of the experience were uncomfortable to you? Select all that are applicable. (**Checkboxes)**
    - None
    - Moving in VR.
    - Interacting in VR (picking up objects, pressing buttons).
    - Figuring out solutions to the puzzles.
    - Solving the puzzles with the other person.
    - Speaking with the other person.
    - Other
        - Elaborate on what made these aspects uncomfortable. **(Text response)**
- What is your opinion of the other person? **(1 - Very unlikable | 5 - Very likable)**
- Did you talk about things other than the supplied prompts? **(Yes | No - Radio buttons)**
- How would you rate the VR experience as a place for social interaction? **(1 - Very poor | 5 - Very good)**
- How much do you agree with the following statements? **(1 - Strongly disagree | 5 - Strongly agree)**

- I learned something about the other person that I would not have otherwise.
- I am glad that I was able to speak to the other person.
- If I met the other person outside of a virtual space, I could see us becoming friends.
- I will forget about the other person by the time I wake up tomorrow.
- Getting used to VR made it difficult for me to connect with the other person.
- I was frustrated by the puzzle section.
- I was frustrated by the other person during the puzzle section.
- I am glad that we had to do the puzzle section.

# AUTHOR'S BIOGRAPHY

Gene Herrschaft was born in Portland, Maine on January 12, 1996. He graduated from Portland High School in 2014. Gene is a New Media major, with minors in Human-Computer Interaction and Computer Science. He has received the UMaine Dean's Award, an Honors College Charlie Slavin Research Fund, a College of Liberal Arts and Sciences Research and Creative Activity Fellowship, and a New Media grant.

After graduation, Gene plans to pursue a career in the video game industry.