

Starry Everything

Submitted to the Art Department, Allegheny College,
in partial fulfillment of the requirements for
the Degree of Bachelor of Arts

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Project Board:

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Artist Statement

Starry Everything is an homage to Stephen Hawking and Vincent van Gogh. The work is about how may we interact with space. In the project, I created the largest space we could interact with, the universe. In addition, the flow of the universe would depend on the viewers. With these interactions, we may think about our relationship with the space and the universe beyond this gallery. Everyone has the choice to create their ideal world in front of *Starry Everything*. It is a discourse between art and science, a discourse between you and me. Do not let the world bring us down; look at the stars, and remain hopeful for a better future.

Acknowledgements

I would like to thank Byron Rich, Ian F. Thomas, and Amara Geffen for all their abundant help and guidance. I have really enjoyed learning and working with you all in the past three years. I did not come to Allegheny as an art major, but—because of you guys—I majored in art, and I love it. While I may not choose art as a career, the sense of creativity I have gained will benefit me in any field I choose to pursue. I would also like to express my gratitude to John Wenskovitch, who taught me how to code and encouraged me to become a creative coder.

When Arthur C. Clarke formulated Clarke's three laws, he pointed out: "Any sufficiently advanced technology is indistinguishable from magic," (Clarke). We now live in a period of time people enjoy the digital world more than the real world though video games and social media. In the article A *"Post Digital" World, Really?*, the author states, "A bigger truth is that while digital is everything, everything is not digital. And, in fact, it never has been, nor will be ,despite dire predictions that our love of things digital would inevitably trap us in socially-isolated cyber caves bereft of real human interaction," (Sable 2012). With my project, I wanted to bring back real human interaction though interactive art; I therefore created a theme wherein viewers can build their own starry night, allowing people to experience the feeling of making their own magic though artwork.

Owing to technological development and innovation, many of the predictions described in science fiction books from 100 years ago are now part of our daily lives. In the beginning of the book *Snap to Grid: A User's Guide To Digital Arts, Media, and Cultures*, Peter Lunenfeld writes "There is a world where galleries overflow with new work, films and videos play non-stop, websites blossom, everyone has at least one acquaintance in common, learned discourse alternates with witty gossip, and every third conversation ends with optimistic projections about the future," (Lunenfeld 2). We can make this come true—not through magic, but through technology—in a way that matches Clark's quote about technology being indistinguishable from magic. There may not be magic in the real world, but we can always create magical outcomes through advanced technology. I want people to be pleased by technology of any kind, and to be optimistic about our human future: a future wherein real and virtual worlds are mixed together.

I have been making art since I was a child, and in my first two years at Allegheny I have spent most of my time learning to write code. When I hear the terms "drawing" and "painting", I

often associate them with the past, the “old days” of pen-and-ink drafting and tinted oils. Yet through my electronic & intermedia art classes, I have explored the vast digital playground where software and code are used as tools for drawing, painting, and creating innovative new forms of visual art.

In my senior project, my goal was to really apply the idea of drawing and painting through code for viewers. In this case, I planned out the playground in which they could create a “starry night” though their movements and gestures. The art-making processing became a collaborative work between me and viewers. I feel that part of my responsibility as an artist is to expand people’s thinking about what drawing is, and what can be considered art. When we make drawings though creative coding, it no longer has the feeling of the past; digital technology is a toolbox which includes every style and medium of traditional drawing and painting, where everyone can draw with computer software and code with the creativity of our minds. With digital interactive technology, more people can be engaged in public space simultaneously. In the space I created, virtual technology is no longer just for personal enjoyment; indeed, it has becomes a means of merging the virtual world with the real world. In today's world, people are becoming increasingly isolated in selective, atomized bubbles within the virtual world. In the gallery space, I wanted to examine the virtual space in a public setting where the enjoyment of digital culture emerges beyond people’s personal cell phones and computers, making the individual experience part of the public experience.

As Raymond Bellour points out, “... The pixel is capable of doing everything. But the extent of this everything suffocates it, and leaves the computer image with doubts itself, in the grips of its own myth,” (Lunenfeld 116). In the next step of virtual technology improvement, we need to create digital spaces that are easier for people to use. This is why we need natural,

intuitive user interfaces for mixed-reality technology. Otherwise, digital visual artwork will always entail a distinction between real and virtual in the viewer's mind. With these technologies, the topic I want to address is that everyone could create their own worlds through these interactive systems: ever since the Anthropocene Era, humans have influenced their environment and the environment has influenced human, in a repeated cyclic system. In my interactive installation, once the first viewer learns how to interact with the piece, others quickly follow the first viewer, and everyone in the space engages in creating artwork together. Through this process, I hoped to bridge the gap between the artwork and the viewers.

Consider watching *Harry Potter*: as part of the audience, it seems totally normal to see everyone using their magic powers; the viewer is immersed in the virtual world, learning with the character. During my time in middle school, I was attracted to the fantasy world; I read tons of Chinese fantastic novels, and I still remember the first time I saw the *Harry Potter* movie *Harry Potter and the Prisoner of Azkaban*. When I received my first computer at thirteen, I started playing more and more video games. The games gave me an escape from the high-pressure world of school, offering me a realm of freedom where my imagination and creativity could flourish. Four years ago, I went to The Wizarding World of Harry Potter over spring break; there I discovered things that had previously only existed in J.K. Rowling's books, or in movies, which could be actually experienced in real world. It is amazing to see the distance between the real and virtual worlds becoming shorter and shorter due to the emergence of advanced technologies.

The field of interactive art is where art and technology can work together to produce new subjects; our creativity need not be limited to novels, movies, and video games. As an art major, I find interactive art to be the most exciting type of art; with interactive art, every work an artist

creates provides a space where people can explore their imaginations. In this space, art is no longer focused on commodity objects that rich people display on their walls, but on the creative experience. In his book, *New Media in Late 20th-Century Art*, Michael Ruch argues that “‘interactive’ has emerged as the most inclusive term to describe the type of art of the digital age. Artists interact with machines (a complex interaction with an ‘automated but intelligent object’) to create further interaction with viewers who either summon up the art on their own machines or manipulate it through participating in pre-programmed routines, that can themselves vary (thus far only in limited ways) according to the commands, or simply movements, of the viewer,” (Rush 171).

Indeed, it becomes an interactive experience for the general public. We have to mention one of the very first artists in the area of interactive art, David Rokeby.



Figure 1. David Rokeby, *Reflexions*, 1982-4, 8 x 8 pixel video cameras, ArtCulture Resource Center

“Reflexions was my first interactive sound installation. I constructed some very bulky 8 x 8 pixel video cameras, connected then to a wire-wrapped card in the Apple][which digitized the images, and wrote a program in 6502 assembly code for the Apple][which controlled a Korg MS-20 Analog synthesizer to make sounds in response to the movements seen by the cameras. Movement also controlled the volume of two tape loops of water sounds. The synthesizer and water sounds were mixed individually to 4 speakers in a tetrahedron (one on the ceiling and three in a triangle on the floor. The sounds would move around you in addition to responding to your movement,” (Rokeby 1983).

Every movement the viewer made had a corresponding sound feedback. Therefore, the viewer became part of the artwork. The goal of my work is to allow viewers to create magic with their bodily movements. The narrative becomes more dependent on the viewer than on me as the artist/designer/developer.

As philosopher Walter Benjamin said, “During long periods of history, the mode of human sense perception changes with humanity’s entire mode of existence,” (Benjamin 1994). In the next coming decade, mixed-reality technology with Internet of Things (IoT) will become part of our daily lives; this prospect compels me to create a preview of what is to come in the near future. Through the projector, I am trying to create a mirror, a window, a wall, a door through which the viewer can find themselves. In any virtual environment, we can ask the same question: “Who are you?” I think the medium of Augmented and Virtual reality (AR/VR) is ideally positioned to address the relationship between people because the worlds we create in AR/VR are so real; unlike the curated superficiality of the digital relationships in social media, AR/VR involves a real meeting between the physical and digital worlds. As Shanken points out, “The first use of VR in art emerged from Myron Krueger’s graduate research in human-machine

interface design in the late 1960s and early 1970s. Krueger envisioned a playful ‘responsive environment’, in which one could interact with computers intuitively through body movement and gesture,” (Shanken 44). This is how I started to plan my project, based on the idea of a space wherein viewers could control the responsive environment with their body and hand gestures.

During my junior seminar, our class went to Buffalo, where we met artist Shantell Martin in Albright–Knox Art Gallery. I agree with Shantell that, “In Martin’s world, a work of art is inseparable from its creator and its audience, and art is more than an object of admiration disconnected from the process of its inception,” (Martin 2018). Most of Shantell’s works are live performance drawings on a public wall. When I first saw her work, I felt immediately engaged with it; because the space was large, we had to move around in order to check out the detail. In my senior project, the interactive viewer can engage with my work in a similar manner; as they move around, their movements may inspire them to start thinking about the relationship between my work and themselves. I want the experience of viewing art to be a fun and playful process, and by creating a setting where this is possible, I hope to inspire more and more people to go to museums and galleries to view and engage with artworks.

My vision is not just about using technology to create an interactive public space: I am also thinking about the concepts of culture and performance as they relate to humans. Martin Heidegger said “The essence of technology is by no means anything technological,” (Martin Heidegger). As a student from outside the US, majoring in art, I explore difficult culture stories with this piece by “playing” with people from different cultural backgrounds and observing the different reaction viewers will have based on their cultural expectations. In the book *Illuminating Video: An essential guide to video art*, the author says that, “The range of subject treated in installation art is easy to summarize as vast—from the spatial and temporal nations of identity, to

the exploration of image culture, reaching from the technological sublime to institution of art itself, to mourning the loss of the natural world and the desire for the renewal of a spiritual dimension in material reality," (Hall/Fifer 165). By creating an interactive installation, we can promote a greater degree of interaction with viewers; these interactions are possible because of the underlying technology that allows the creation of the artwork. The ways we use technology and view artwork are different in all kind of social settings, but because the viewers have the ability to control the work and to play with it, I hope every viewer can have fun with it.

After the midterm review meeting, I started seriously considering how I could go about creating a project in a 3D space. While reading books about new media art, I found British artist Matt Clark and his work *New Dawn*.

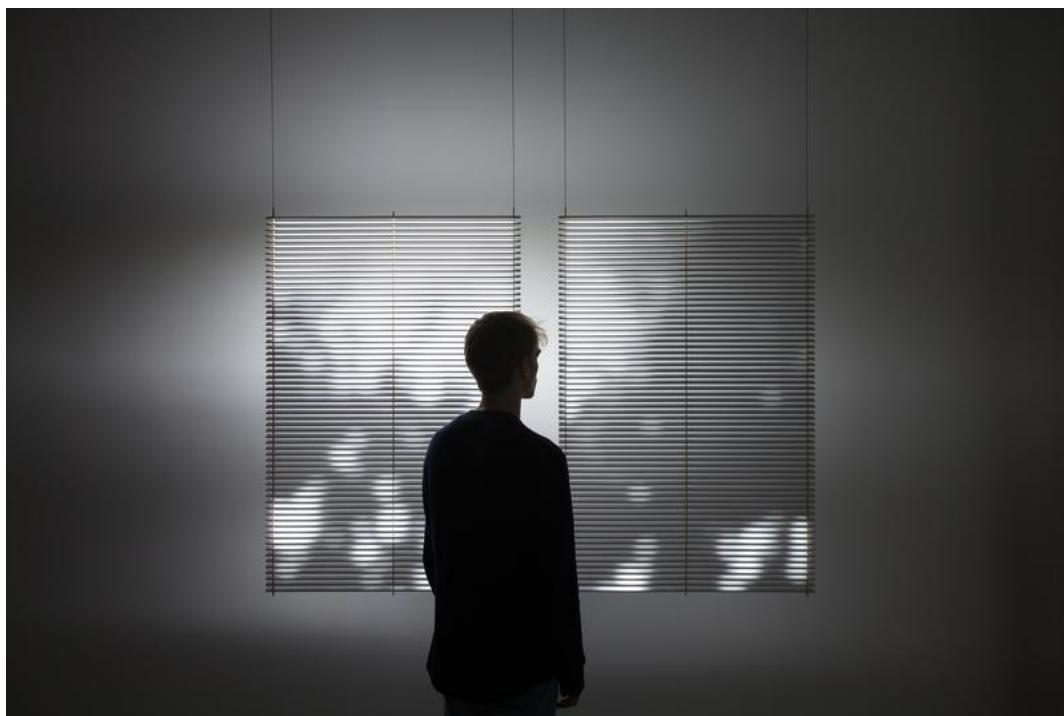


Figure 2. Matt Clark, *New Dawn*, 2018, Acrylic, Brass, LED, Custom Electronics, Code, 340 × 170 × 3.5cm, London
"New Dawn is a sculpture that displays sublime light, dappling across its surface," (Clark 2018).
Inspired, I began brainstorming a lot, getting new ideas from my surroundings: everything from

windows to trees suddenly seemed alive with artistic possibilities. I even considered using turf rug—a material people commonly use at home—to display in the gallery as artwork. After thinking about the natural and the artificial, I was determined to go beyond, transcending both. I want people to feel comfortable with future technology, but also to enjoy the outdoors and engage with nature as well. I did it linking technology and universe together as a whole and it could inspire people.

In one of my computer science classes with Prof. John Wenskovich, I learned the Processing programming language, with which I created the “2048” game for that class’s final project. As a gamer, that was my first time implementing a game on my own. Since then, I became increasingly interested in creative coding. I also learned a lot about my programming style: although I am not a “pure programmer” who knows every detail about computer science, I view programming as a tool in my art-making process. I taught high school students creative code using and Processing during the summer break in my sophomore year. For my final project in Art 385 Electronic & Intermedia Art II, I made a drawing robot, and for the final project in my video production class, I used Processing and Max/MSP to make an experimental film about water. When I started my senior project, I knew I wanted to combine all these skill sets together. While it is not a comprehensive body of work, I used this project to apply many of the elements and techniques I learned at Allegheny, creating an interactive art project using the Processing programming language as a new form of drawing. I also intend to use this project—which I consider to be one of my strongest artworks to date—as a key feature in my portfolio when I apply for graduate school.

Because I hadn’t used Processing for nearly two years prior to undertaking this project, I had to relearn a lot of the elements of this programming language in order to reach my artistic

goals. The first project I created with Processing was 200 random circles with random colors that would move around; since then, I knew I wanted to make a dynamic project.

While I was practicing my skills in Processing, I was also avidly perusing the works of graduate students from NYU, Parsons, and RISD. For me, the advantages of viewing graduate students work were the fact that I have a similar skill set, and can easily learn from their projects. One project deeply inspired was a piece by Caoyuxi, entitled *Mo*. (Figure 3)

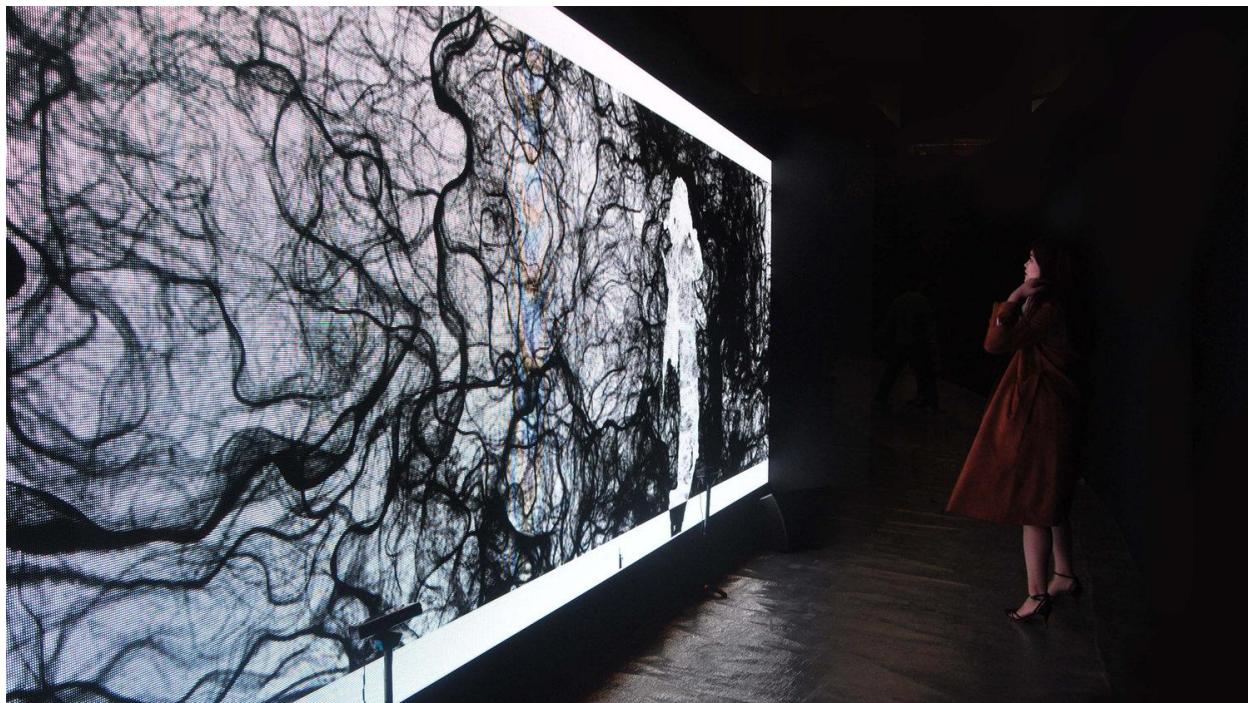


Figure 3. Yuxi Cao, *Mo*, 2016, LED, Processing code, webcam, dimensions vary, New York

“*Mo 墨* is a parametric particle system based on Brownian motion system, The character 墨 is simplified Chinese for the word mo (墨) meaning ink, a name for this self-customized particle system made by using Processing in Java... The form of the project is highly mutable, manifesting itself in post-rendered video or real-time visuals with interactive applications in Operating Systems or Web browsers,” (Cao 2016).

I really liked the idea of using a computer system to create representative Chinese ink drawings; later, I made my own ink drawing piece using the 3 ArrayList functions in Processing. I learned from grad students and current artists in the area of interactive art as well, including Zach Lieberman, Golan Levin, and Kyle McDonald. Unlike traditional artworks—such as paintings, drawings, and sculptures—many interactive art works are not strictly object-focused but also function as performances; they may be presented in public settings that have larger number of viewers than traditional gallery settings. John Dewey, in his essay “Art As Experience.” claims,

“Experience is the result, the sign, and the reward of that interaction of organism and environment which, when it is carried to the full, is a transformation of interaction into participation and communication. Since sense-organs with their connected motor apparatus are the means of this participation, any and every derogation of them, whether practical or theoretical, is at once effect and cause of a narrowed and dulled life experience” (Cahn & Meskin 302).

I find it important to remind myself of the fact that, no matter what experience the interactive art project brings, it always encourages a positive dialogue between artist and viewers.

By early March, I felt confident with my Processing skills; at around the same time, my Kinect arrived. I started play with Daniel Shiffman’s Openkinect for Processing library, and for my midterm review, I created a ball which would follow the viewer’s hand. I gained many insights from the midterm review, and also realized that there were many questions I needed to answer: Is this a game or an entertainment? What do I want the viewers to obtain from this experience? After the midterm review meeting, I also began thinking about the possibilities of projecting on a 3D surface. Because my ball project—built with Openkinect for Processing—

was not very successful, I considered switching to other libraries. A few days after the midterm review, Stephen Hawking passed away; as a tribute to Hawking, I had the idea of creating a project about the universe: a broad realm of infinite possibility where art and science meet each other. The notion I want to bring in was that the universe is always the place magic happens, and Hawking was one of the most important people in the fields of physics; to honor his contributions to the discovery of the nature of universe and to the education of the general public, I wanted to use the project to open a discussion about humanity's relationship with the environment, with technology, and with the universe.

By the middle of March, I finished reading *Making Things See*, which is a guidebook for using Kinect as a creative tool. I then decided to change my Kinect library to SimpleOpenNI, a computer vision library developed by Apple. I followed the guidebook and made a body drawing machine as my very first project using this library. In the program, the viewer can draw a red line on a background using their body and gestures. After I understood how this library worked, I made a program wherein the viewer can draw words I provide. I also integrated the program in Processing, written by Shiffman, into my Kinect project; in later days, I would use ParticleSystem to create the star effect. During the midterm review, Professor Miller suggested that I may consider using their people's code as a baseline. Around that time, I also discovered an open-source code about Flowfield, written by artist Jerome Herr(Figure 4); I really liked this program and I used it for the dynamic motion effects in my starry sky.

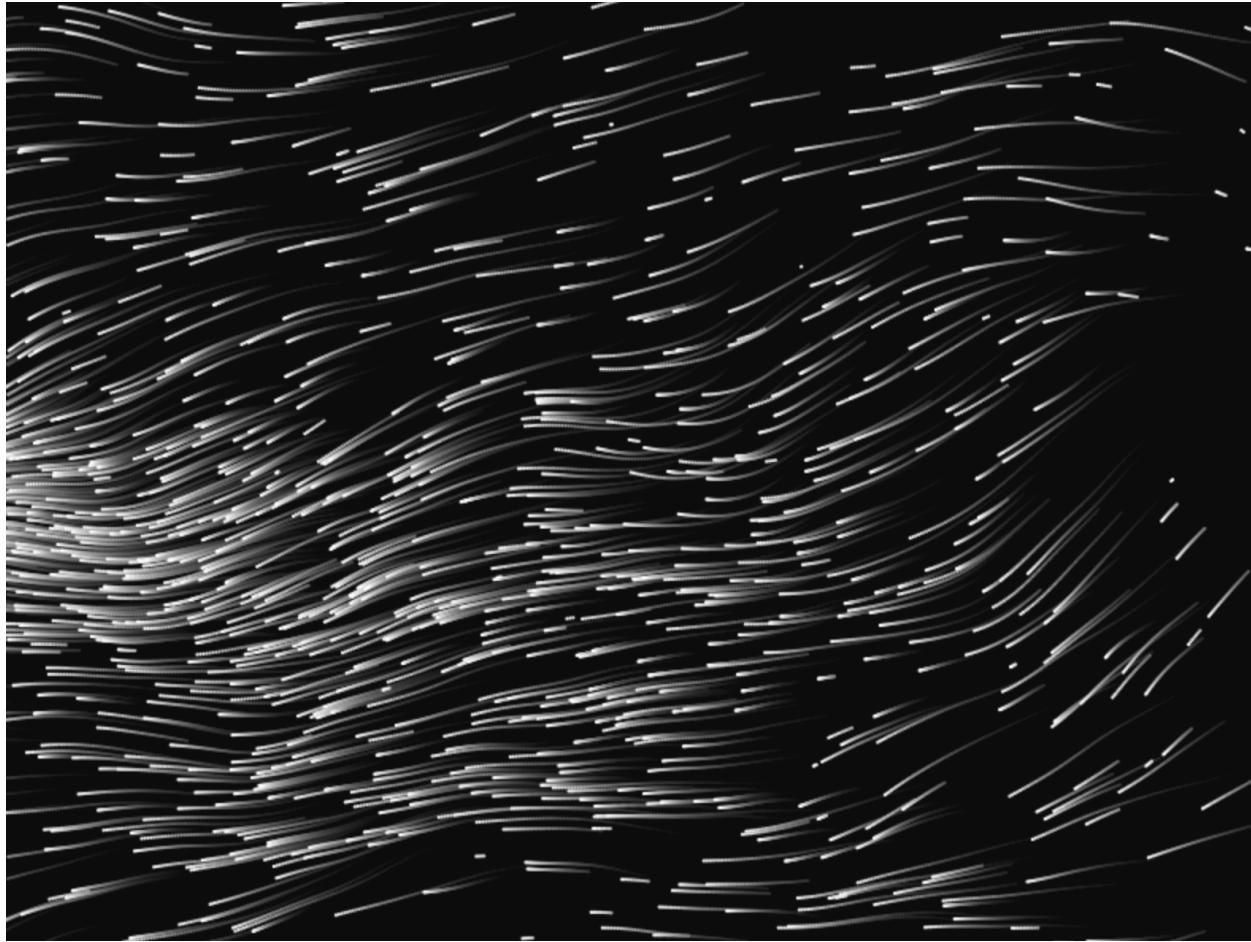


Figure 4. Jerome Herr *Flowfield*, 2014, Processing code, dimensions vary, Source code:

<https://www.openprocessing.org/sketch/157576>

My next step, based on Flowfield, was to create something to fit my goal. In the original code, the location of each flow was dependent on a random x value and a random y value, which I changed to closestX and closestY so that it depends on the viewer's closest point. This can be their head, hands, or any other part of the body. Using these parameters, I built an integrated Flowfield system whose flow depended on viewer interaction.

The Flowfield example was my starting point for the final version of the project; after that, I began the process of building things. When coding in my dorm room, I would sometimes look out the window, thinking about the world outside; one day, the thought struck me: what if I were to superimposed the starry night on my window? Following up with my idea, I made the

Flowfield in random colors so that it resembled my starry sky after the color change. I then created a program that I could use later to create a virtual window which changes from black to white as the viewer moves. During this process, I considered art as performance and considered the role of the conductor in music, calling forth responses with his gestures. I then incorporated the ParticleSystem code into this project, using Photoshop to turn the particles into yellow stars.

After all these processes, the project itself still felt empty and incomplete. I looked up “artwork about stars”, searching for inspiration, and—not surprisingly—Google search directed me to Vincent van Gogh’s *The Starry Night*. I immediately thought of David Rokeby’s Cheap Imitation, an homage to Marcel Duchamp, who was himself an inveterate re-user of existing works of art. Rokeby described his piece as follows: “In Cheap Imitation, I have cut up Duchamp's "Nude Descending a Staircase" into the several hundred facets that make up the work. The faceted image is projected approximately life size (such that the nude is life-size) on a wall of the gallery. Each facet is interactive, emerging from darkness only when there is movement in front of that facet's exact location in the painting,” (Rokeby 2002). I was seized with intent: I would render a moving starry night as a derivative cut-up of Van Gogh’s masterpiece, enabling viewers to “paint” their own interpretations of the famous painting though their body movements. I sought to recreate and reimagine the work of Van Gogh by my own definition of Starry Night.

In April, I continued adding new elements into the project each day. The first thing I did was create a moon; based on some open-source example code I found online, I added in the moon, the mountains, and the fire. After iterating the project through about seven versions, I finally completed my work.

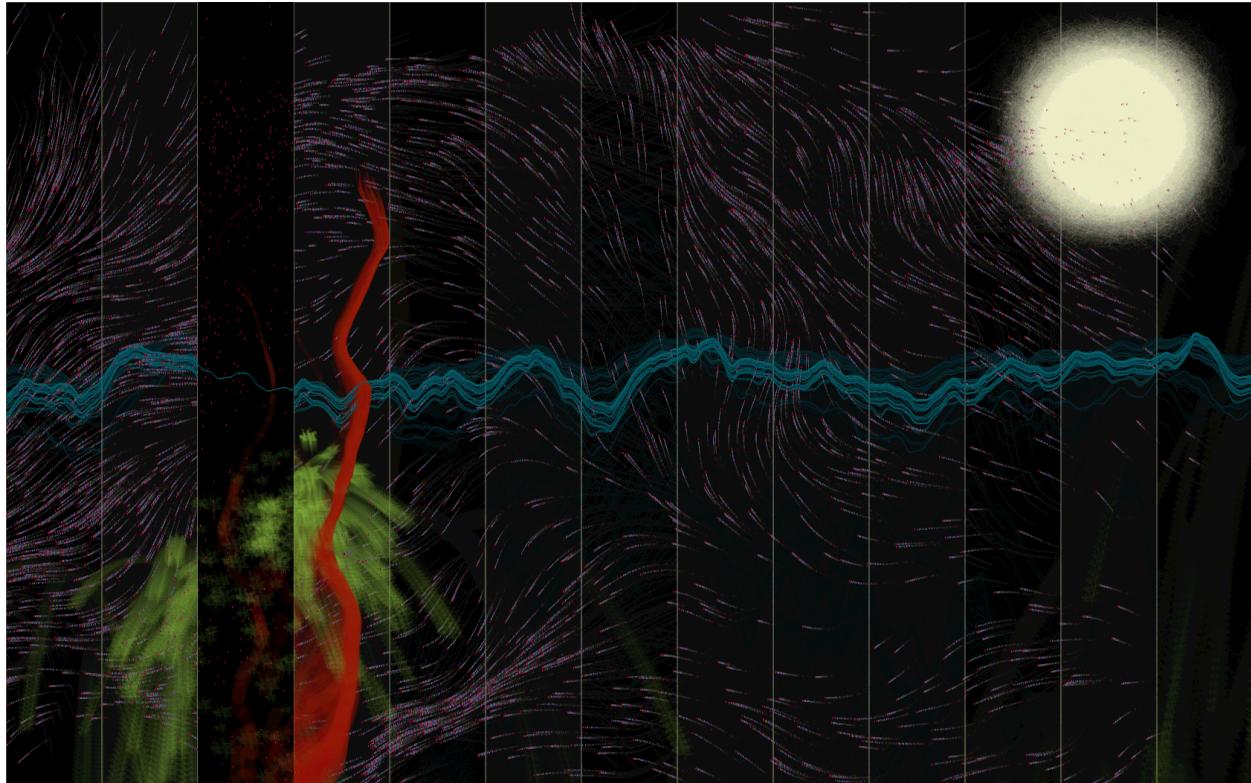


Figure 5. Haoyu Wang (Henry), *Starry Everything*, 2018, Processing code, Kinect, dimensions vary, Allegheny College

I really enjoyed the learning and building process, especially came to the end I needed to install my work by myself. Designing and figuring out how to use the gallery space was also important for the final product. Also, I enjoyed inviting and talking with viewers during the opening reception. When they interacted with my work and smiled that was the moment I really want to become an artist, an artist can make people happy and smile. Also, with all these interactions viewers could make, they often forgotten about the technology part of the project. I think that's important for me to remember, because it's not the technology that attracts viewers, it's how me as an artist can use technology to attract viewers, also let them feel positive about the future.



Figure 6. Haoyu Wang (Henry), *Starry Everything*, 2018, Processing code, Kinect, dimensions vary, Allegheny College

While the project is not directly linked to Stephen Hawking, the idea of creating a work about stars and the universe was directly inspired by his life and his death. With the playful experience I created, I wanted people to become more curious about the world beyond earth. My first name in Chinese is 哲 (Hao) 宇(Yu); translated into English, it means, “take the moon and explore the universe”. Although I don’t have a strong background in the hard sciences, my dad has always encouraged me to learn about subjects like geology and physics, and Hawking and the space often remind me of my childhood. This project, during my senior year at college,

seemed like a fitting opportunity to pay a symbolic tribute to the past while also extending the boundaries of art in technology into the future.

Vincent van Gogh also was the first artist whose work I encountered the first time I came to the United States. It was one of the turning points in my life, and one I wished to remember, so on my first trip to Europe, I went to Amsterdam to spend an entire day at the Van Gogh Museum. I admire the way his art depicts nature, and in my own project, I hoped to portray nature and space through code in order to show the technological development of art-making. Even though Hawking and Van Gogh were each afflicted with chronic disorders they were able to explore the universe. With the reminders of these two masters, I also argue that if we look at the starry night, the universe is the same for us. And if we think the world we live in is a mess, than jump outside of the window; there is equality to be found there.

While I can list numerous benefits of technology, we must keep in mind that technology is not always the answer. The question is raised after the interactive experience: what do we really want for our society? As the artist Zach Lieberman said, "... In interactive installations, you see yourselves, the artwork goes from your body to your mind, then back to your body," (Lieberman 2017). The process of interacting is the process of thinking; while I have no answers about what the future holds, I hope viewers will be inspired to start their own conversations about it after experiencing *Starry Everything*.

Works Cited

- Benjamin, Walter. "The Work of Art in the Age of Mechanical Reproduction." *Walter Benjamin*, www.marxists.org/reference/subject/philosophy/works/ge/benjamin.htm.
- Cahn, Steven M., and Aaron Meskin. *Aesthetics: A Comprehensive Anthology*. vol. 29., Blackwell Pub, Malden, MA, 2008.
- David Sable "A 'Post Digital' World, Really?" *Google*, Google, www.thinkwithgoogle.com/marketing-resources/a-post-digital-world-really/, 2012.
- Hall, Doug, Sally J. Fifer, and Doug E. Hall. *Illuminating Video: An Essential Guide to Video Art*. Aperture in association with the Bay Area Video Coalition, New York, 1990.
- "InfoInfo." *Shantell Martin - Info*, shantellmartin.art/info/, 2017
- Lunenfeld, Peter. *Snap to Grid: A User's Guide to Digital Arts, Media, and Cultures*. MIT Press, Place of publication not identified, 2000.
- Rush, Michael. *New Media in Late 20th-Century Art*. Thames and Hudson, New York, N.Y, 1999.
- Shanken, Edward A. *Art and Electronic Media*. Phaidon Press, New York;London;, 2009.

Works Consulted

- Borenstein, Greg. *Making things see: 3D vision with Kinect, Processing, Arduino, and MakerBot*. OReilly, 2012.
- Greene, Rachel. *Internet Art*. Thames & Hudson, New York;London;, 2004.
- Levin, Golan. "Art That Looks Back at You." *TED: Ideas Worth Spreading*, www.ted.com/talks/golan_levin_ted2009#t-3004, 2009
- Paul, Christiane. *Digital Art*. Thames & Hudson, New York, 2003.
- Vesna, Victoria, and Viktorija V. Bulajić. *Database Aesthetics: Art in the Age of Information Overflow*. vol. 20, University of Minnesota Press, Bristol;Minneapolis, Minn; 2007.