

URCO FALL 2016 GRANT PROPOSAL

Nicholas Carpenter, Student, Department of Art & Design
Mark Koven, Mentor, Department of Applied Sciences and Technology

FOR PROJECT

Pollution Particle Simulator

Interactive Motion Graphic Installation

Visualizing Air Pollution Through Video & Audio

PROPOSAL NARRATIVE

INTRODUCTION

Air pollution is a global health crisis; the emissions associated not only contribute to the overall progression of climate change, but also provoke localized air quality issues for urban places. The cities of northern Utah exhibit some of the worst air quality measurements in the world, consistently landing in national news headlines for their multiple lethal “red-air” days during the winter months. In 2004, Logan, UT was recorded as having the worst air quality in the nation, with a measurement of particulate matter reading over $132\mu\text{g}$ per cubic meter of air (Malek, Davis, Martin, Silva 108). This measurement is well above the National Air Quality Index’s “unhealthy” condition, which begins at $55\mu\text{g}/\text{m}^3$ for listed “red days.” The topography of these valleys are only partially to blame for these conditions - the root of the problem resides in the saturated presence of ammonia from livestock, interacting with nitric oxide produced by the exhaust of road transportation. These pollutants come together in cold weather conditions to form particulate matter 2.5, which is exceedingly harmful to breathe. In fact, over exposure to PM 2.5, has significant contributions to lung cancer and other cardiovascular issues.

Art and video are compelling vehicles of communication that are capable of altering public perspective on pressing world issues through education and inspiration. The video projection would illustrate the problem of air pollution by visualizing the key pollutant particles in Cache Valley (ammonia and nitric oxide), where they originate from, and how they interact with each other to form the harsher compound of particulate matter 2.5. Viewers would enter an immersive visual and audio environment that would entice the viewer to claim ownership, revealing their own impact and demand them to consider how they contribute locally to air pollution. This display would also force viewers to consider how their actions and inactions ultimately influence the total accumulation of global greenhouse gas emissions. The objective of the piece will be to bridge a union between the arts, computer processing technology, and the topic of

sustainability, to inspire viewers to question their own environmental impact, then seek answers for reducing it.

PLANNED APPROACH

Through the use of projected motion graphics, a fog machine, a live video motion capture device and surround sound audio, viewers will be placed in a darkened space of only light and sound. The fog machine is in place, not to symbolize the pollutants in the air, but to provide a vapor for which the light produced from the projection may interact. This interaction will lift the video's image from the surface of the wall to appear simultaneously in the air around the viewer, further immersing them in the atmosphere of the space. The smoke machine will be installed out of sight, and mounted to the ceiling alongside the projector so that, aside from the people and the video of particles, the space will be empty. Simplified imagery of air pollutants will be projected on a wall within the space which will create a metaphor that represents visualized pieces of nitric oxide and ammonia in the form of amorphous geometric shapes. These animated reactions, typically invisible to the naked eye, will interact with pre-recorded audio of vehicles, livestock and other sounds of pollution producers. Through the course of the video, the sound will gradually become more intense through increased volume and additional layers of audio from different pollutant emitting sources. As this sound intensifies, the amount of particle animations on the screen will increase until the entire wall is filled with the color of the particles. This will be the climax of the video installation; the screen will then go black, and the sound will completely stop. After a few seconds of silence and no visuals, the video will reset and loop the same process as before. This regularly looping piece of video will highlight how these pollutant particles (nitric oxide and ammonia) are coming together to create the much harsher compound PM2.5.

Utilizing the Kinect technology, a motion sensor/capture device, viewers will be able to see a digital silhouette of themselves in the projected video of the particles. These digital silhouettes will mirror their own movements in the space, and will also emit particles from the outline of their silhouette onto the rest of the screen. This will be done through the coding program "Processing" combined with the Kinect motion capture device. As the silhouettes emit particles, the viewer will then have control over the acceleration of the video. The more people present in the room, the more quickly the video will fill with particles and the faster the video will reach the end of its cycle. This will create a sense of cause and effect from the viewer, thus leading to a claimed ownership of their greenhouse gas emissions and thereby helping them to visualize their own impact, not only on the space, but also in tandem with others within

the space. Following this experience, viewers will be able to take home a printed zine created for the event. The zine will contain information on steps that community members can take to reduce their emissions. The zine will also feature a link to a website on the exhibition. On the website individuals can seek out further information on the installation, and also post about what changes they are making to reduce their own pollution output.

Andrea Polli, and Charles Beneke are contemporary installation artists who have sought to bridge the gaps between the arts, technology and sustainability. Andrea Polli's *Particle Falls* is similar to my proposed installation in that it focuses on the topic of air pollution, and effectively brings together the arts, technology and sustainability. In *Particle Falls* she projects a digital animation of a waterfall onto the side of a building. The display changes in appearance with the real-time measurements of particulate matter in the air, becoming more beautiful as the air becomes more saturated in pollutants.



Andrea Polli, *Particle Falls*, Projection show at Mona Bismark America Center, Paris 2015



Charles Beneke, *Prop*, Installation at Utah State University, Logan UT February, 2016

Charles Beneke is a printmaker and installation artist, his work focuses heavily on humanity's production of air pollution and carbon emissions. In his installation *Prop*, Beneke wedged a black, amorphous cloud-like form in the upper corner of a gallery space, pinned there by wooden struts. The shape represented the accumulation of humanity's carbon and greenhouse gas emissions through our course, "of actions, of inactions, of passive disregard and concerted neglect." He posed the question, "Do we choose to be defined by this problem that we have created, how we let it control us, or the strength with which we battle it?" Similar to my proposed installation, Beneke urges his viewers to take responsibility for how we are altering our world, and to take action by changing their own habits and behavior.

These works by Polli and Beneke both resulted in the public's increased understanding of the issue at hand, requiring communities to assess their own actions. My piece will function to spark a similar reaction in the public, however, it would be further expanded by incorporating motion graphics, audio, smoke machines and interactive technology to create not only a space, but an atmosphere for viewers to interact with. The immersive experience of my exhibit will result in the community recognizing their own personal role in the production of air pollution. This resulting conversation on air pollution would take place locally in Cache Valley, at the State Capitol's posters on the hill and nationally at NCUR.

DEPTH OF INTEREST

Video and sustainability have long been interests of mine. While attending Utah State University I have pursued an Interdisciplinary Degree combining the College of Arts with the College of Humanities, focusing on visual communication through means of photography and video production. While studying this I also worked as a videographer for the Jeffrey D. Clark Center for Entrepreneurship, as well as the Head Photographer for the Utah Statesman.

This passion for seeking out the most effective way of visually communicating ideas led me to apply for the BFA emphasis in Graphic Design. In the classroom, many of my design and photo/video projects have combined topics in sustainability with the arts, eliciting discussions on conservation in a setting where such topics don't often arise. Notable projects include a digital photo series on the waste caused by single-use items. A photo from this series, titled *Landfill*, was selected for the *2015 Utah Arts and Museums Statewide Annual Exhibition*. Continuing with this theme of sustainability I brought in my background with video production to create a video installation piece titled *ConsumerNation*. The piece

focused on the process of consumerism and the adverse effects it imposes on animals, the environment, and the consumers themselves. This was communicated visually through use of a projector and multiple television monitors placed in a shopping cart. This video art installation has been exhibited on campus in the *Fine Arts Projects Gallery*, as well as the *Logan Block Arts Festival*. These projects not only exhibit my passion for sustainability, but also my experience in environmental design and video art installations.

This addition of an emphasis in graphic design and my further exploration of sustainability in video and the arts led me to complete an internship with the *National Geographic PhotoArk*. I worked closely with Joel Sartore, a photojournalist and environmentalist, to create video content that communicated his mission of photographing every captive species on the planet in an effort to inspire conservation and protect these animals for future generations. I was able to collaborate further with him in creating animated motion graphic versions of his photography, to be used in his PhotoArk exhibition at the *National Geographic Museum* in Washington D.C., and during his *Nat Geo Live* presentations. After this, Joel and the Oceanic Preservation Society invited me to create additional versions of these motion graphic video clips to be used in a video projection show on the side of St. Peter's Basilica as part of the Pope's Encyclical on climate change. This projection show, titled *Fiat Lux*, was done in response to the Paris Climate talks and reached over 227 million people through the live broadcast and by the sharing of the footage on various social media platforms. From this experience, I was able to witness the shared emotional response to a piece of video art, causing millions of people to unite over a common issue.

These past experiences and projects that I've had the opportunity to work on, have led me to this current stage in my career as a visual communicator. With the funding of the URCO grant I would be able to pursue my own recent interests in Processing, and the capabilities of creating digital art through the writing of code in combination with video. This knowledge and experience with Processing will increase my ability to compete with other designers and artists within the field of motion design and video installation. More importantly, being the recipient of this grant would allow me to continue my exploration of the interactions between art, technology and sustainability; and in doing so, create an exhibition that would inspire positive behavioral change in viewers. A positive behavioral change leading to a community's reduction in overall greenhouse gas emissions.

References

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EDUCATION PLAN

The following are educational outcomes I anticipate learning from the process of completing the URCO funded project.

- I anticipate learning how sustainability, art, and technology can come together to effectively communicate an idea.
- I anticipate being able to inspire community viewers to take ownership and action on air pollution.
- I anticipate learning how to incorporate interactivity in a piece of installation art and gain insight on how viewers respond to an interactive art installation.
- I hope to gain a basic to advanced understanding of Processing, an application capable of creating digital art through the writing of code.
- I hope to be able to effectively combine this method of Processing with video, audio and motion capture. An interdisciplinary ability that I hope to employ in future works as well.