The Full Pink Moon

Dan DeGeest - Masters of HCI
An Independent Study with Professor Alex Braidwood advising - Spring 2024

Overview

The Full Pink Moon was a semester-long independent study that I completed in order to investigate, learn, and obtain more practical, extensive, and hands-on experience creating an interactive media installation experience.

Professor Alex Braidwood supervised and facilitated the work via his 3 credit ARTGR 690 - Advanced Topics offering. We met weekly for approximately one hour to discuss the project, work on ideas, solve technical issues and set deadlines and expectations.

I wanted to focus on 2D graphics, generative visualizations, installation design/build/install, microcontroller programming, and live performance. After a few initial research cycles of various sound and other technologies, I chose to pursue a collaboration with the local art band, Wiitch Tiit, that performs a unique show each month that coincides and celebrates the full moon. For this collaboration, we choose to create an interactive visual experience for their April 2024 “The Full Pink Moon” show which included the follow components:

- **Visuals** - Generative visuals created specifically for the show and projected on walls and band costumes during their live music performance.
- **Effigy** - An Aurduino controlled interactive effigy that provided audience participation and real time visuals interaction through a series of puzzles and artifact elements that symbolized Earth, Air, Fire & Water. A fifth puzzle, Love, was also incorporated required the audience to collaborate to complete by combining copper wires to complete a circuit.
- **Venue** - Stage design and aesthetics of the physical space, projection surfaces, and effigy and puzzle clue placement for the audience interaction component

Visuals

To create the visuals I chose to work in Processing to obtain more experience in this popular graphics programming tool introduced in my first semester in the program. My initial work was focused on setting up an application environment that would make it easy to add multiple visualizations and switch between them. This work included

creating visualization base classes and robust event and keyboard support for both automatic and live performance. All of the code used in the project can be viewed in the LCDeeD Github repository.

With these systems in place I then spent time making some custom visualizations as well as porting/reworking some that I found on the OpenProcessing site. This involved converting the P5JS code to Java then fixing bugs. Once they were running, I made many modifications to suit my needs, increased performance and added new functionality. The visualizations used are noted in the main sketch file in the repository.

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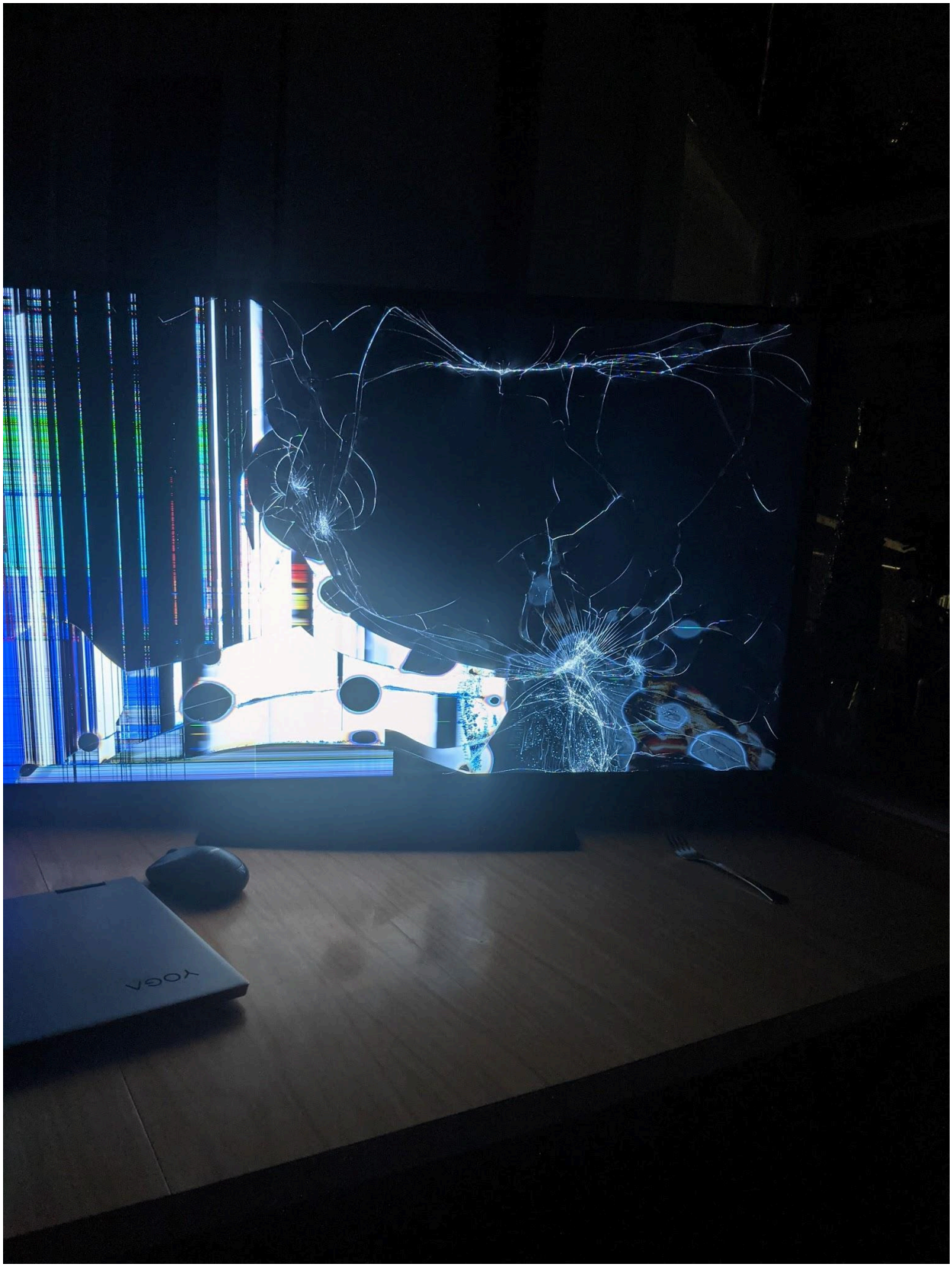
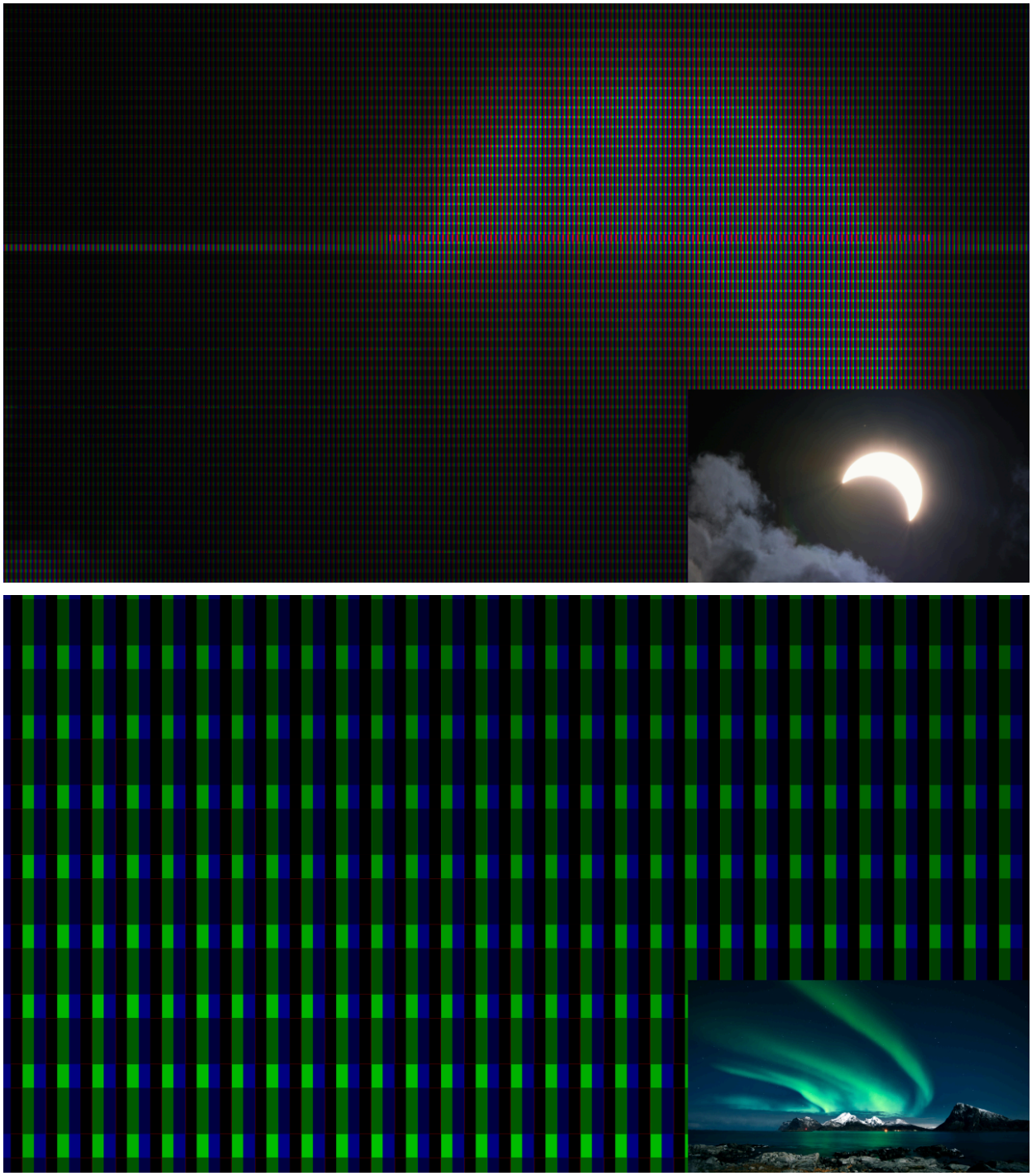
Not long after this initial graphics work I came across a broken LCD TV at my job at the Ames Resource Recovery Plant. When I turned on the TV, I was very taken by the pattern created by the broken glass and oozing liquid - I found it quite interesting and beautiful. This discovery inspired me to investigate if/how I could simulate a similar visual effect in Processing.


YOGA

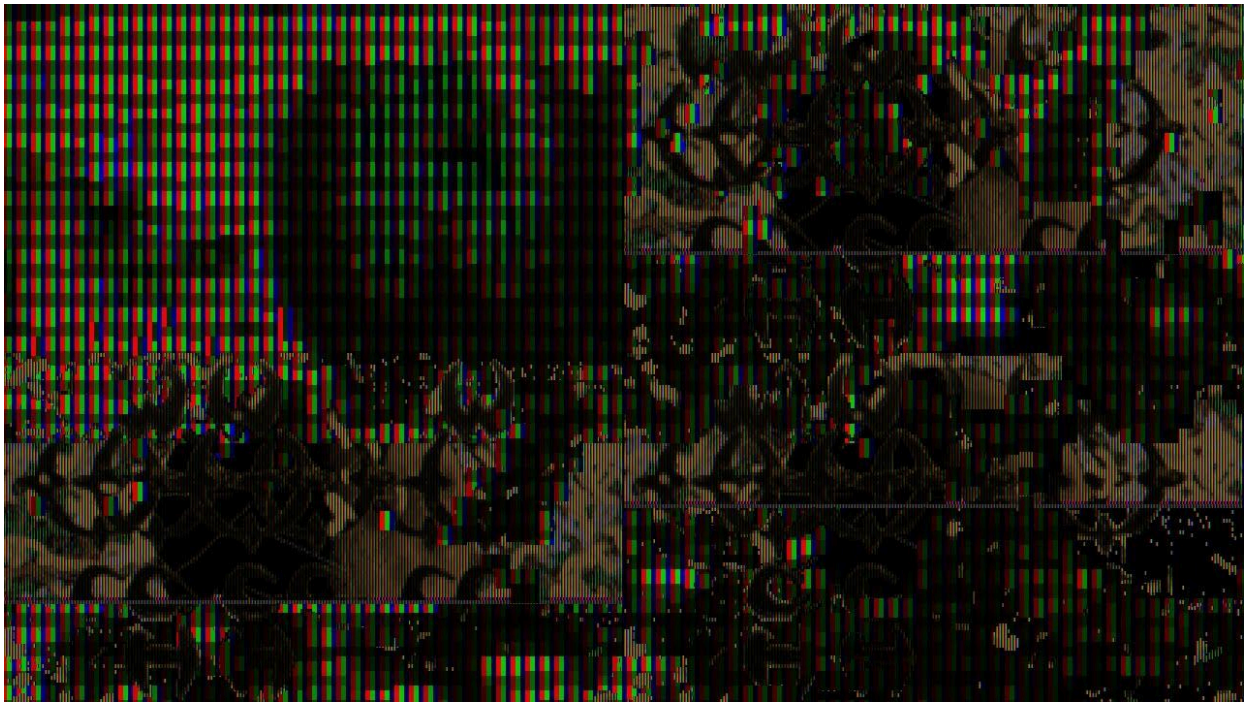
This started a fairly intensive effort to develop a graphics filter for applying LCD TV-like effects in Processing that could overlay all the other visualization content I was simultaneously creating. It culminated in the creation of LCDeeD, a LCD TV display simulation.

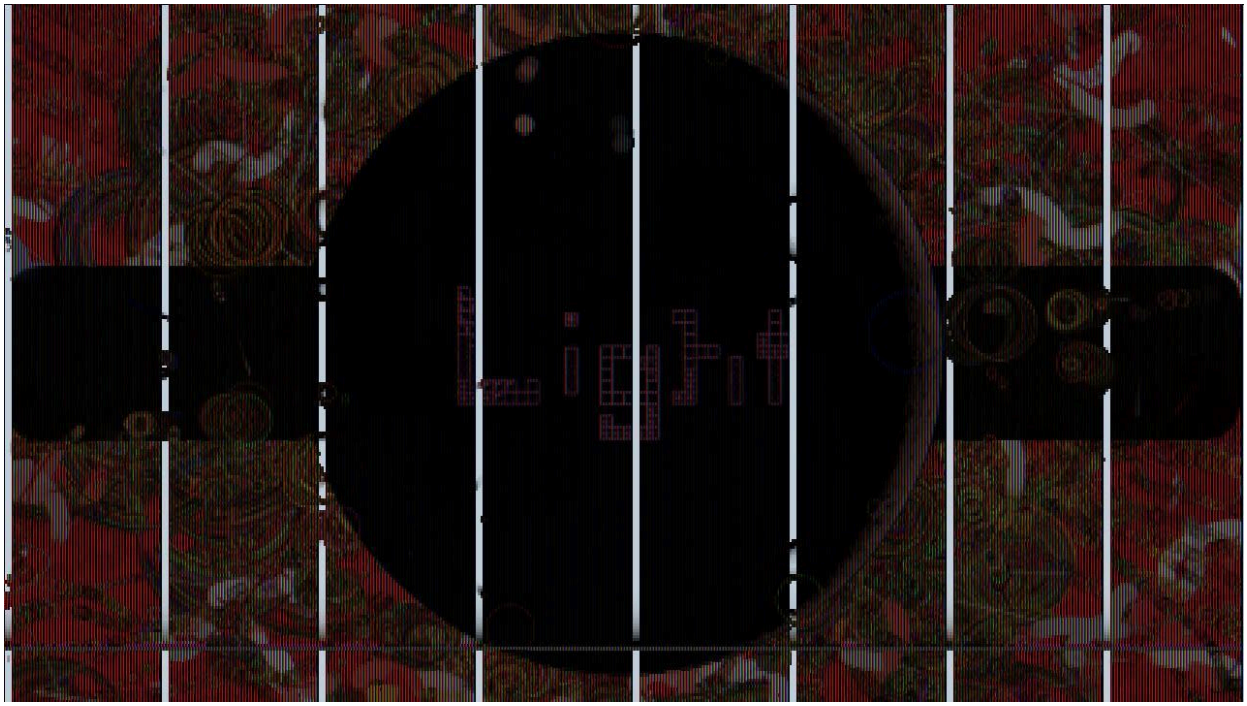
The LCDD object takes the supplied graphics buffer (a PGraphics object in Processing) as input. This buffer can be drawn and composited with all the normal Processing graphics techniques normally used to draw directly to the display before it is sent to LCDD where it is downsampled and rendered via a simulated RGB pixel LCD TV display. One pixel in the source graphic is displayed as a 3 X 3 pixel with 3 subpixels, one each for RGB (9 physical display pixels) in LCDD. An HD image (1920 X 1080) is therefore displayed as a 640 X 360 in LCDD resolution.

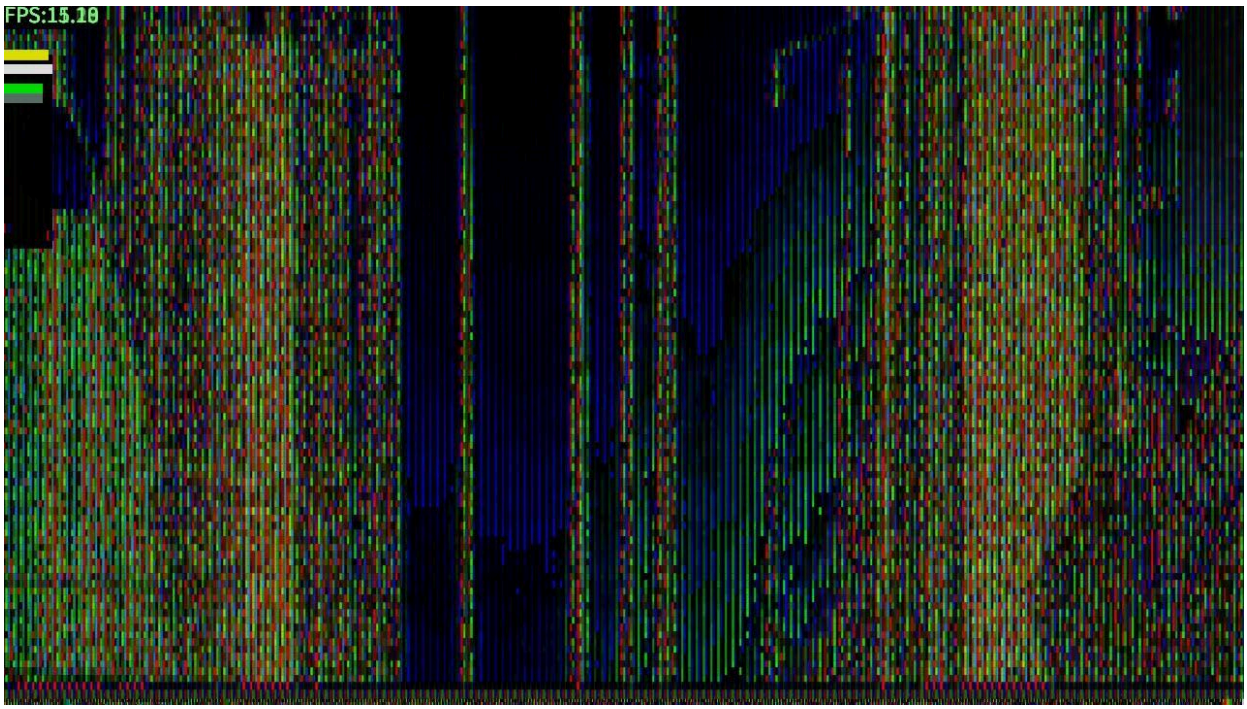
The images below show examples of a source image rendered in LCDD. In the second image I have scaled up to a very large factor in order to show the LCDD subpixel rendering for each pixel.



With LCDD rendering in place, any source buffer could be rendered in this way including the various visualizations I had started with, movies, camera video and any content drawn by the Processing graphics engine to the composited back buffer. I began a lot of experimentation with this compositing process and have hundreds of test images trying different combinations of source content, scales, mixtures, colors, etc.. Here are a few. More can be viewed on Github in the screenshots folder.



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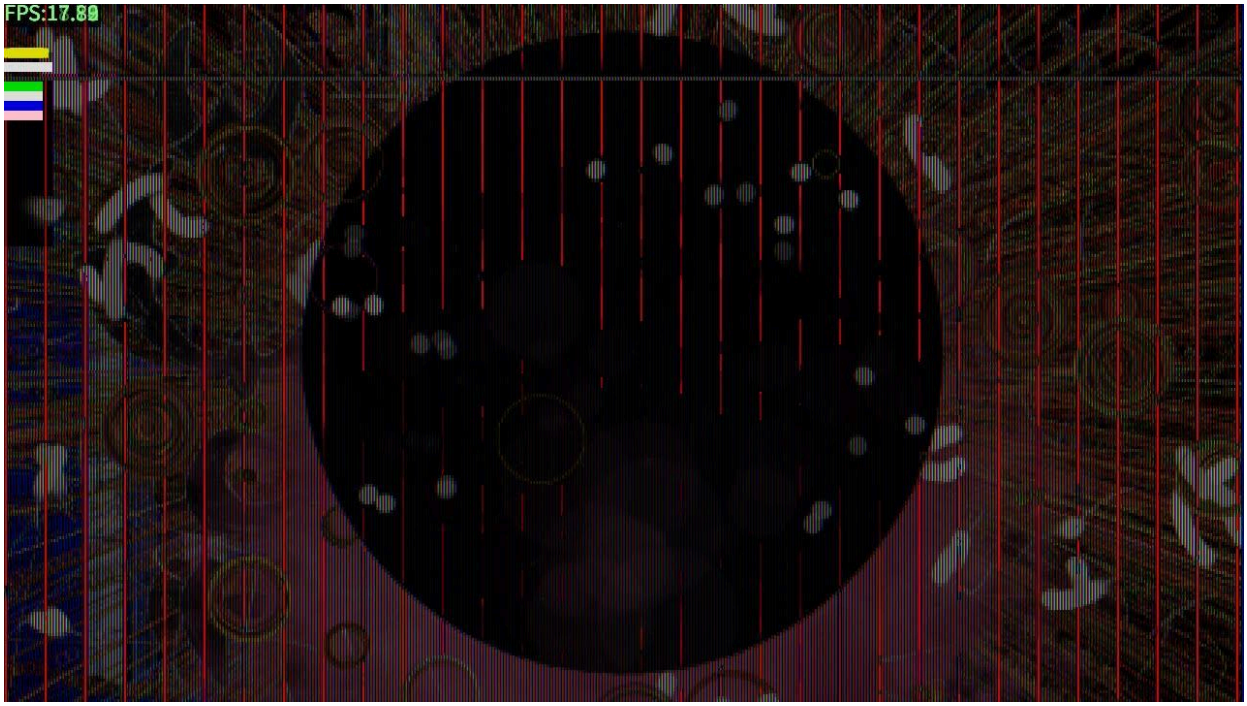
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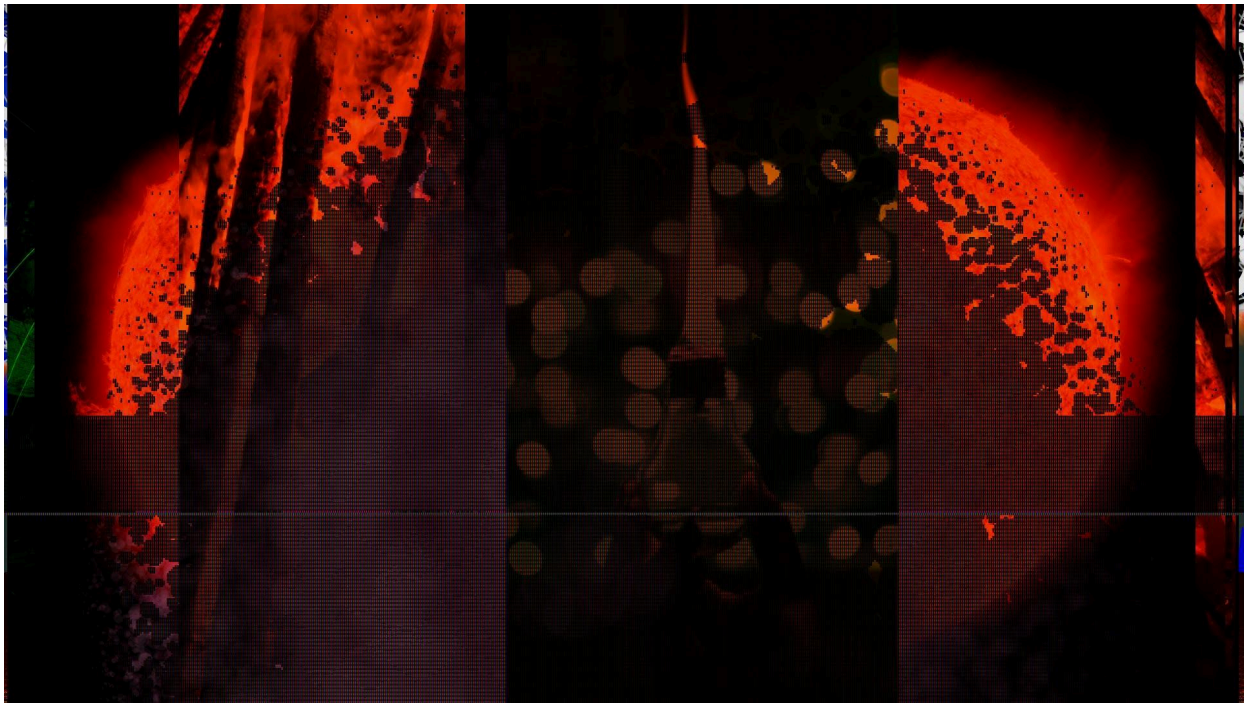

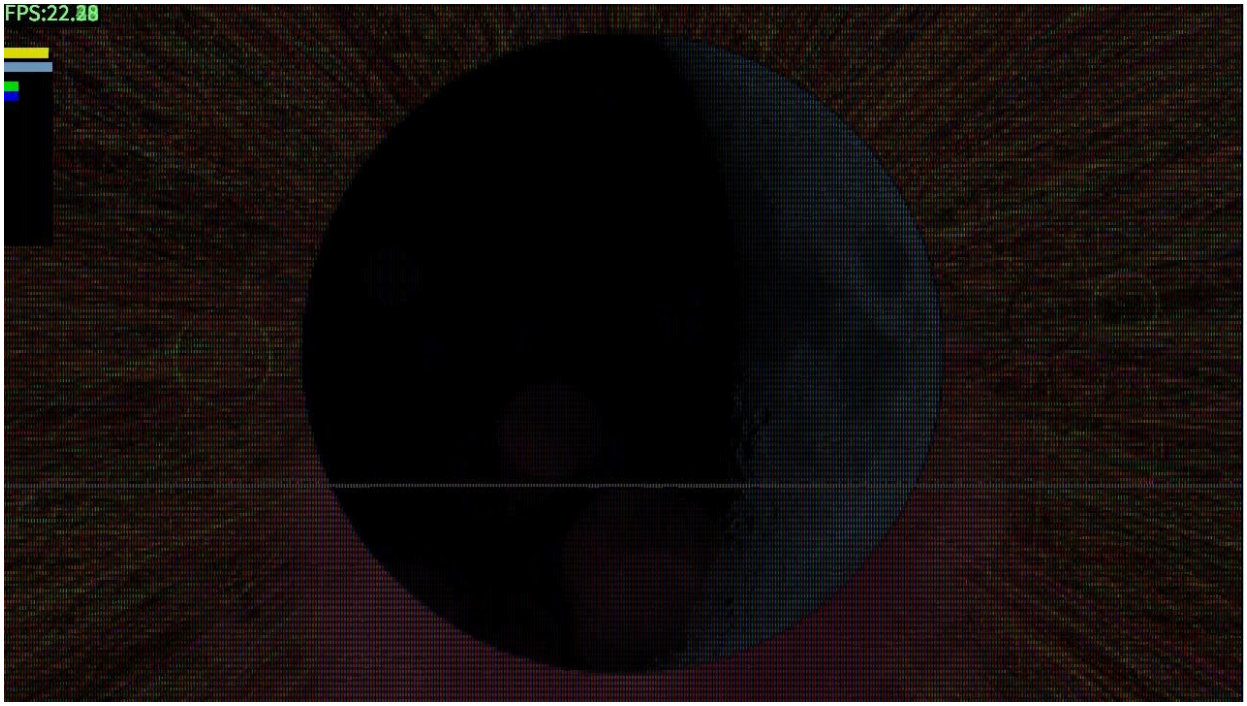
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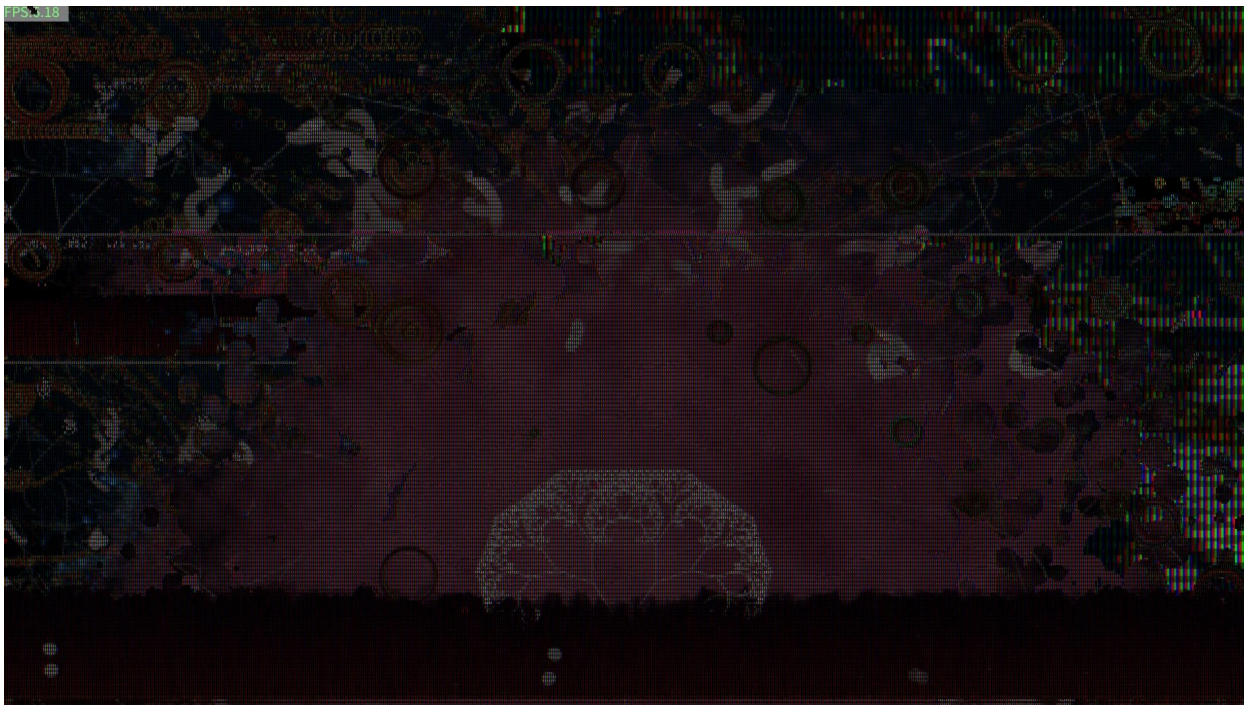
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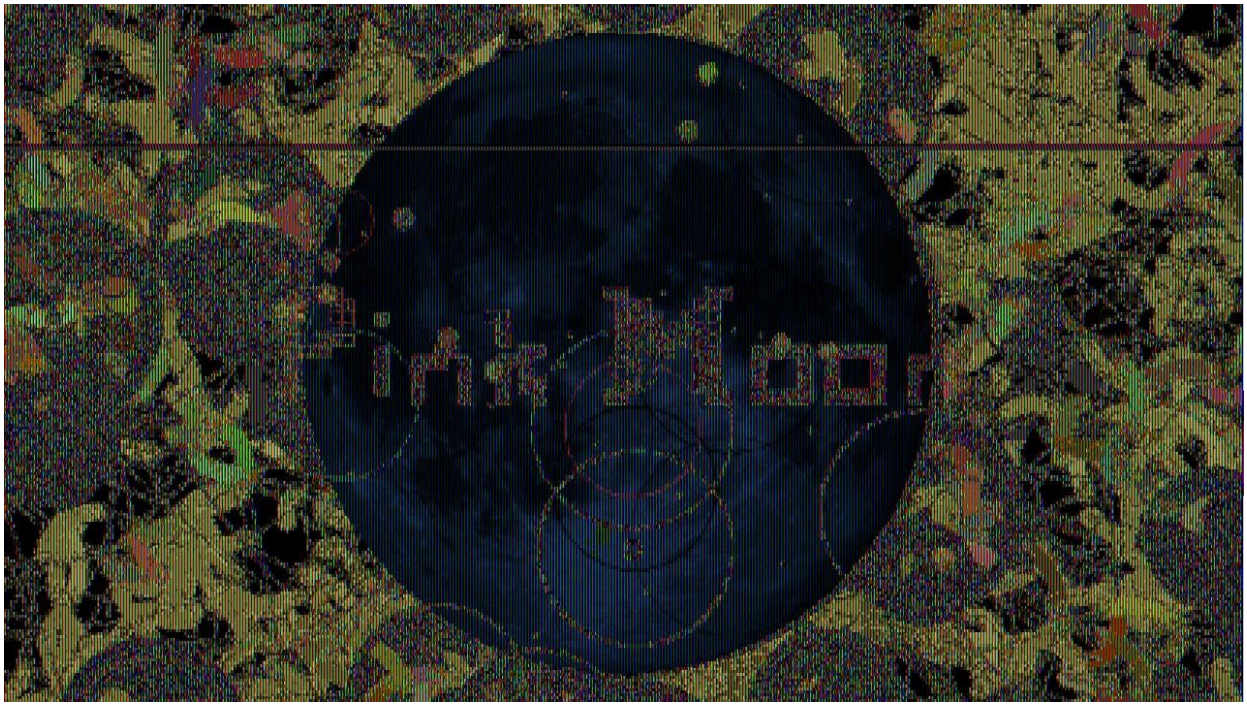
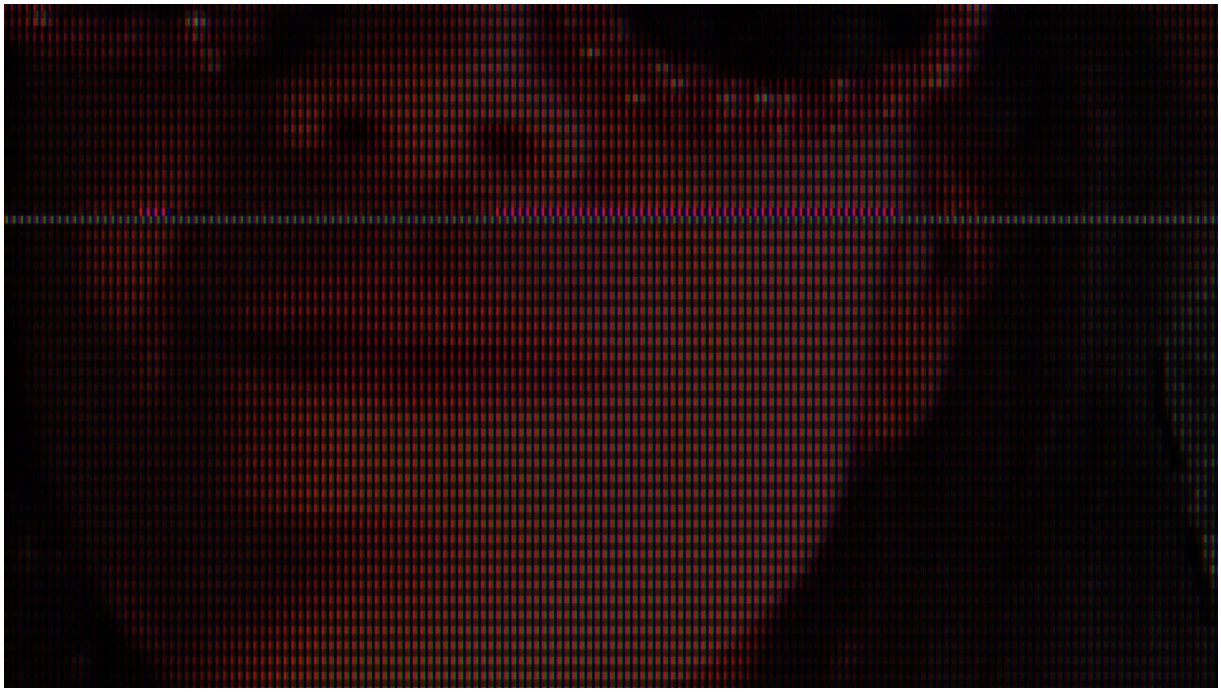




It became apparent as I continued with this process that the visuals became more interesting when the overall scale was increased and the detail was further reduced. Moving between scales, changing images and source input, and pixelated animation at large scale became the primary focus of the final visuals and several more weeks were spent refining the graphics, optimizing for performance, refining the event system for automatic, random generative visuals and effects, and creating a keyboard interface to support real time performance of visuals utilizing the same events.

This was achieved by creating a VisEvents interface and defining events that were used in both scenarios.

LCDD Keyboard Interface

'**%**' toggleAuto	// EFFIGY '**e**' toggleEffigy '**E**' pinkMoonFinale
// BACK BUFFER '**b**' toggleBackground '**a**' randomTint	// PIXELS '**:**' pixelMode '**7**' briteMode0

'**A**' backgroundTint '**c**' backgroundColorReset '**C**' resetTint	'**8**' briteMode1 '**9**' briteMode2
// LYRICS '**j**' nextLyric '**J**' lyricsChange '**K**' toggleLyrics '**k**' randomLyricColor '**l**' incLyricFont	// SELECT INPUT '**!**' toggleTV_0 '**@**' toggleTV_1 '**#**' toggleTV_2 '**$**' toggleTV_3
// VISUALIZERS '**f**' toggleFire '**h**' toggleHito '**i**' toggleInnerDD '**I**' innerConnect '**o**' toggleFlies '**O**' toggleGrass '**[**' mowGrass '**]**' growGrass '**p**' toggleSchiff '**s**' toggleSlides	// TV CONTROLS // ON/OFF '**1**' selectTV_0 '**2**' selectTV_1 '**3**' selectTV_2 '**4**' selectTV_3 // SELECT INPUT **TAB** splitScreen '**t**' togglePIP
// OVERSCAN '**M**' overScanToggle '**/**' overScanColor '**?**' overScanColorReset '**<**' overScanWidth	// SCALING '**-**' scaleDown '**=**' scaleUp '**+**' scaleReset '**_**' transReset

'**>**' overScanInterval '**.**' overScanWidthReset '**,**' overScanIntervalReset	'**Z**' centerScaleTV // LOGO '**L**' toggleLogo
// RESETS '**0**' resetAll **BACKSPACE** resetVis	// SLIDES '**g**' slidesFire '**G**' slidesDev '**w**' slidesWiitch '**W**' slidesMoon '**P**' togglePhases
// Movies '**u**' rewindMovie '**U**' nextMovie '**T**' closeMovie '**v**' videoToggle	// TRANSPARENCY '**y**' slideBrighTInc '**Y**' slideBrighTDec '**D**' toggleDebug **ENTER** saveFrame

Key knowledge and skills developed by the visualization component of the independent study:

- Photoshop
    - Overall proficiency improved (selections, transparency, background removal, green screen, magic eraser, selection modifiers)
    - Leaned batch processor
    - Learned custom action creation and usage
- Content
    - Free image sourcing and resamplings
    - Video green screen production techniques
- Processing
    - OOP design with reusable base classes and interfaces, minimal global variables

    - Custom event class and processing that will be used in future projects (VisEvents)
    - Deeper understanding of Processing graphics engine, buffering, and rendering
    - Performance optimization
    - Save as .EXE
    - Video library usage for both movies and live camera video
    - Serial port reading
- Hardware
    - Projector setup and multiple projector alignment (doubling)
    - HDMI over CAT5
    - HDMI splitting

Effigy

An effigy is a key part of all Wiitch Tiit full moon shows. Historically the effigy will have some relationship to the particular full moon and the season. The effigy can take any form but is always made from organic and combustible friendly materials with the intention that it will be burned at the conclusion of the band's musical performance at a nearby outdoor location. With that in mind, it is also designed to be easily moved from the venue to the burn location. You can find examples on Wiitch Tiit's Instagram.

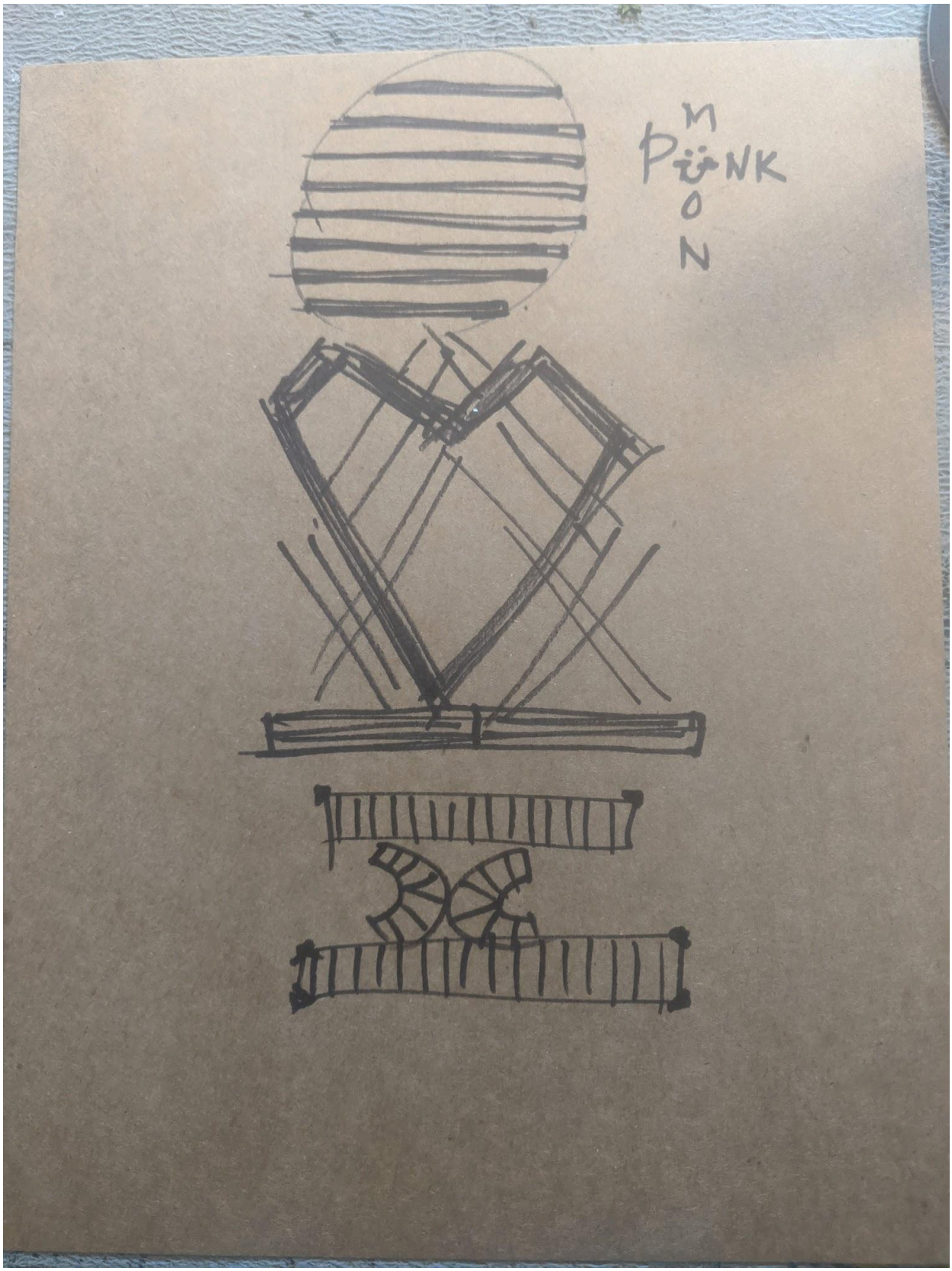
For this part of the project I wanted to explore design and build using primarily wood and found objects but also wanted to add a technology component that would allow me to gain more experience with basic wiring and Arduino programming. After a few consultations with Professor Braidwood, I decided to make the effigy have a puzzle feature that would use simple circuits and removable artifacts. The artifacts would be placed in the venue and puzzle clues would be distributed to the audience and it would be their job to find them and correctly place them

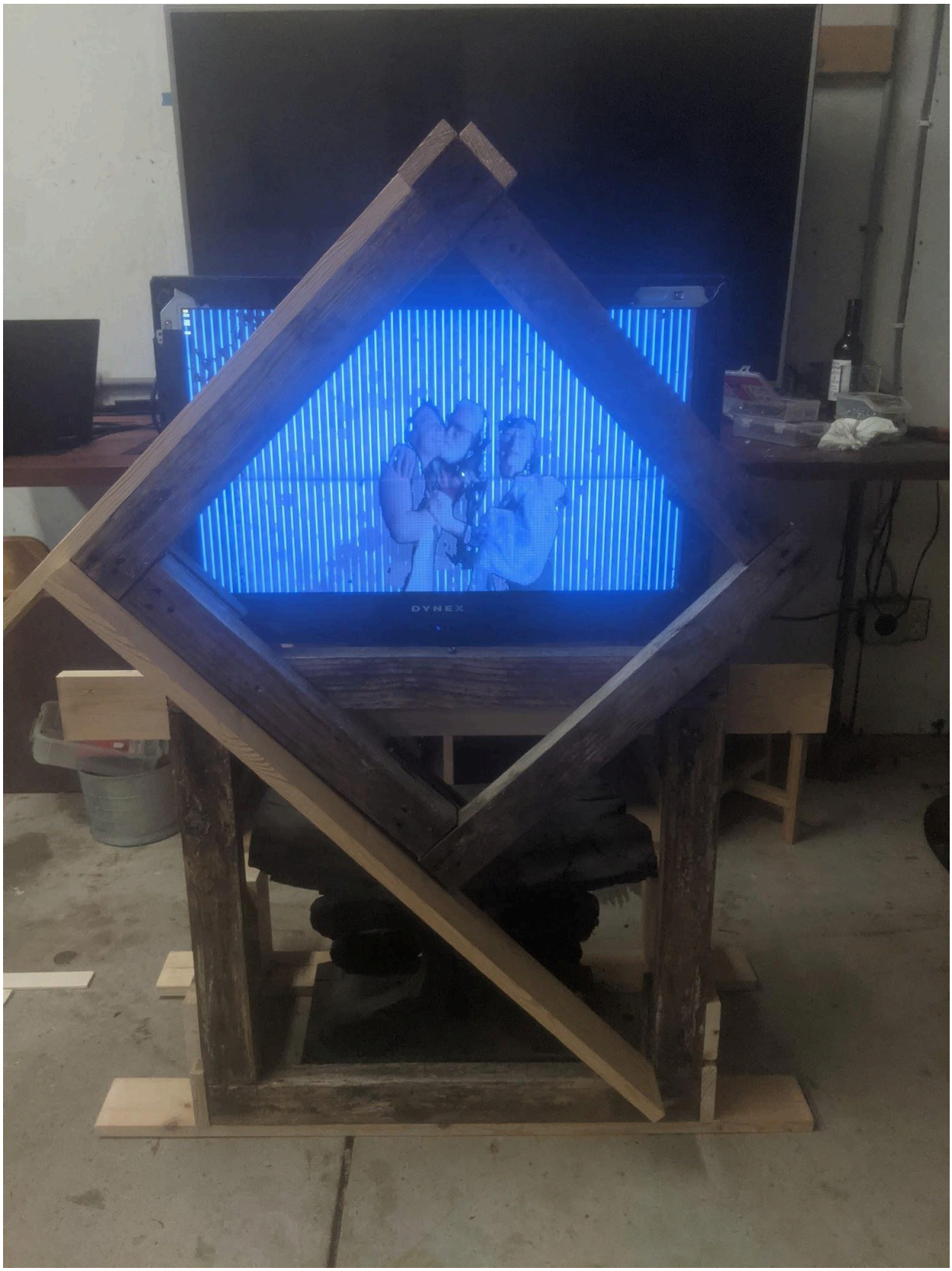
Once an artifact was located it needed to be correctly placed on the effigy to complete a circuit being monitored by the Arduino. When a circuit was closed the effigy would illuminate a pink LED and send a message to the Processing sketch over the serial connection to allow for visualization changes that alerted the audience that a puzzle had been completed.

For the design I had a loose idea of including a pink heart and a moon in the effigy. I also had set a limitation of using mostly found wood and objects with the only new material being some wood lath strips, which I knew would burn more quickly then the

other wood being used. How the effigy would burn was always being considered during the design and I wanted it to be a slow, controlled event with the base burning more slowly then the top so that pieces would fall off in dramatic ways while the audience watched. Using the lath I could have some control over the burn.

Below are images of the effigy design, fabrication, wiring, and final presentation.


MOON
PINK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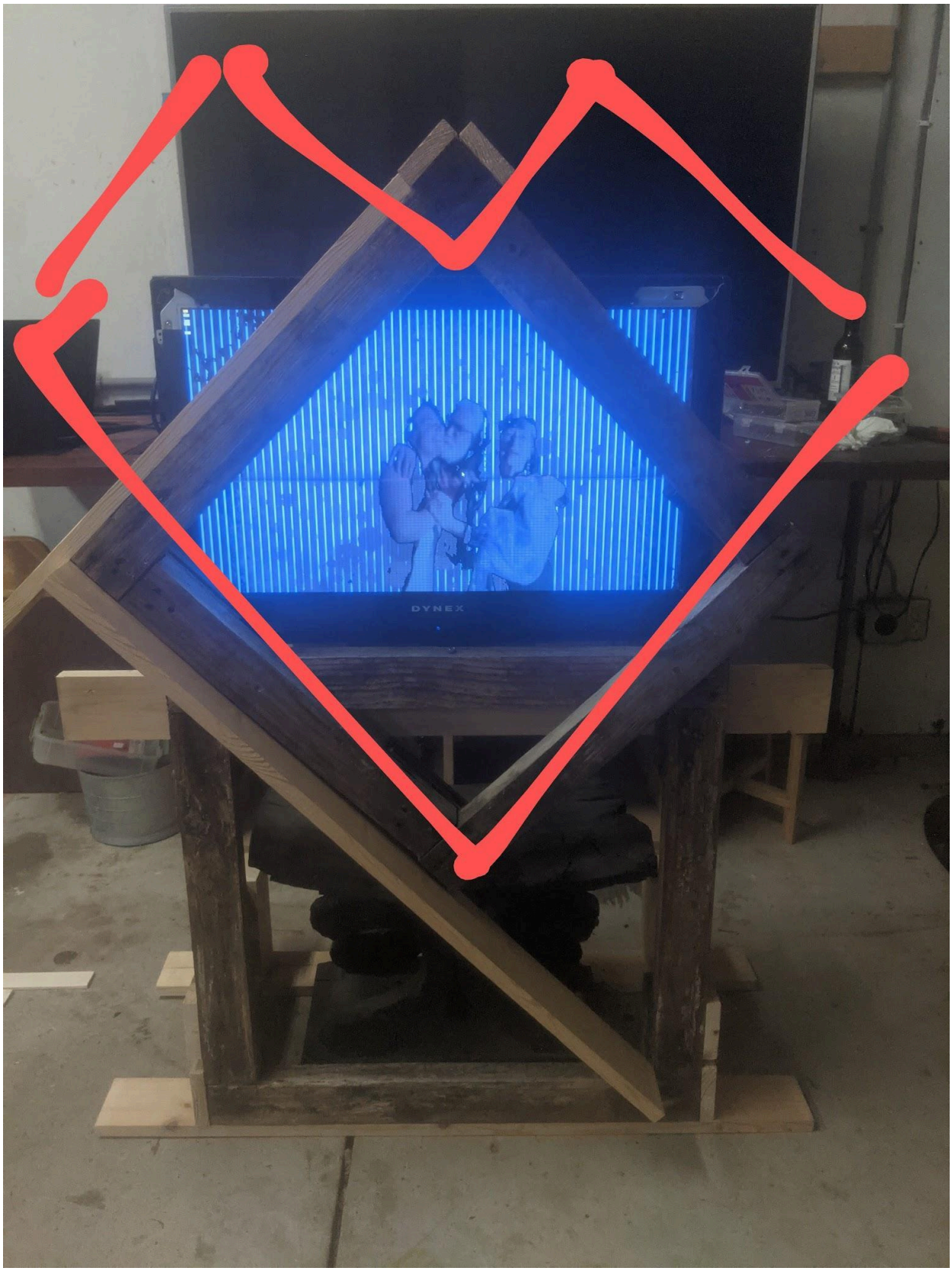
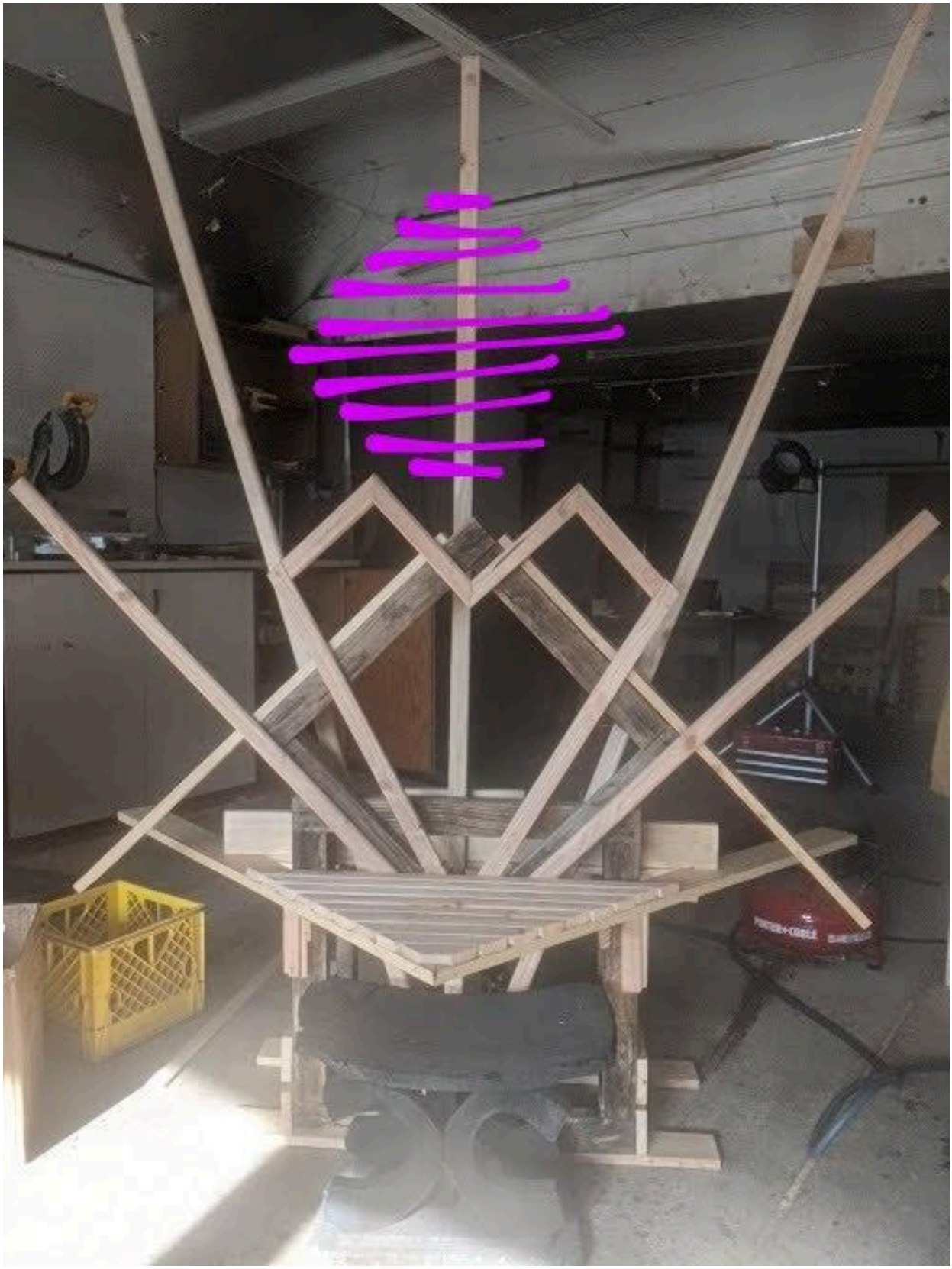
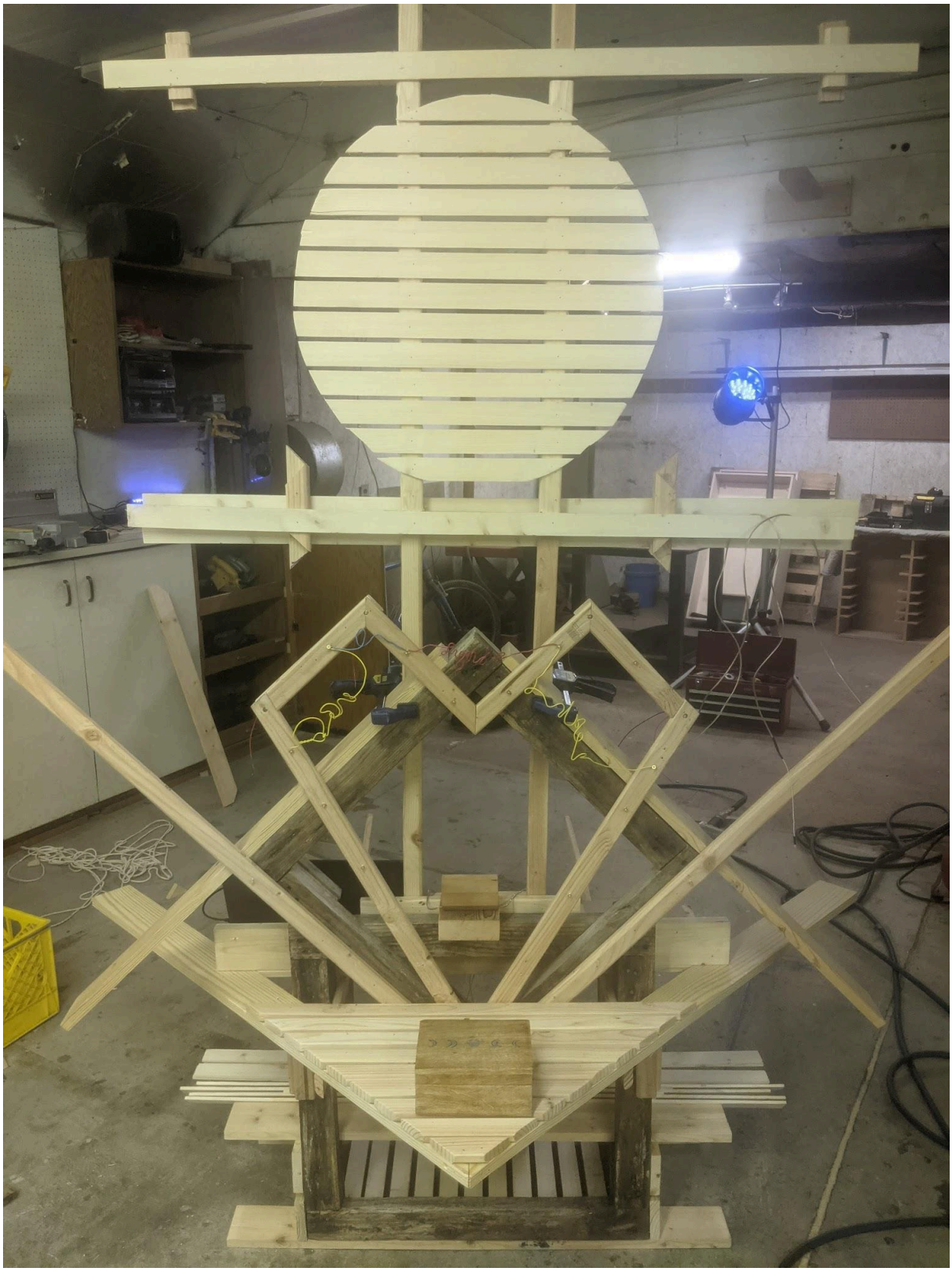
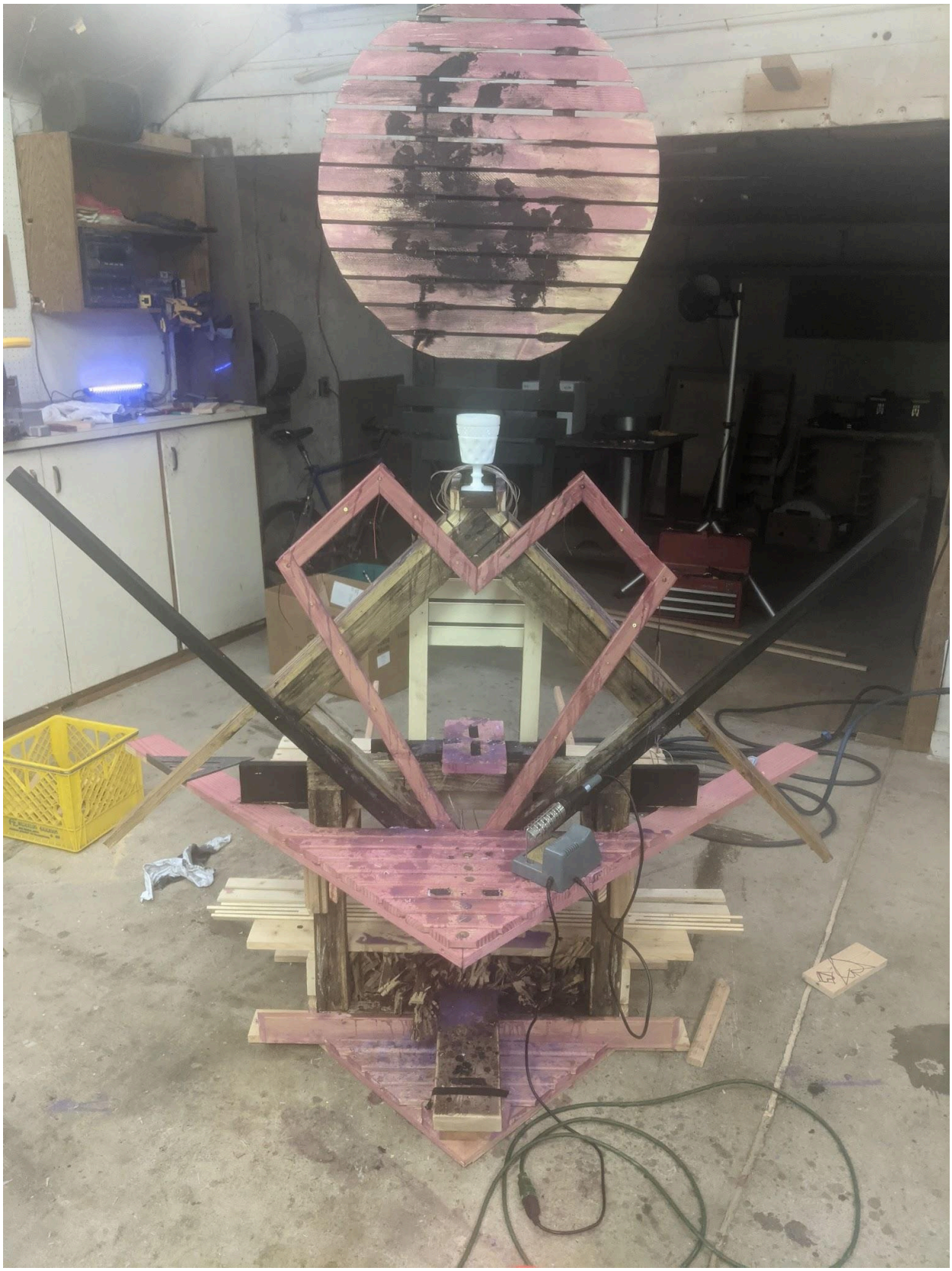

DYNEX

TRAYPAK
INTERTECH
PORTER+CABLE

TRAYPAK
INTERTECH
PORTER+CABLE







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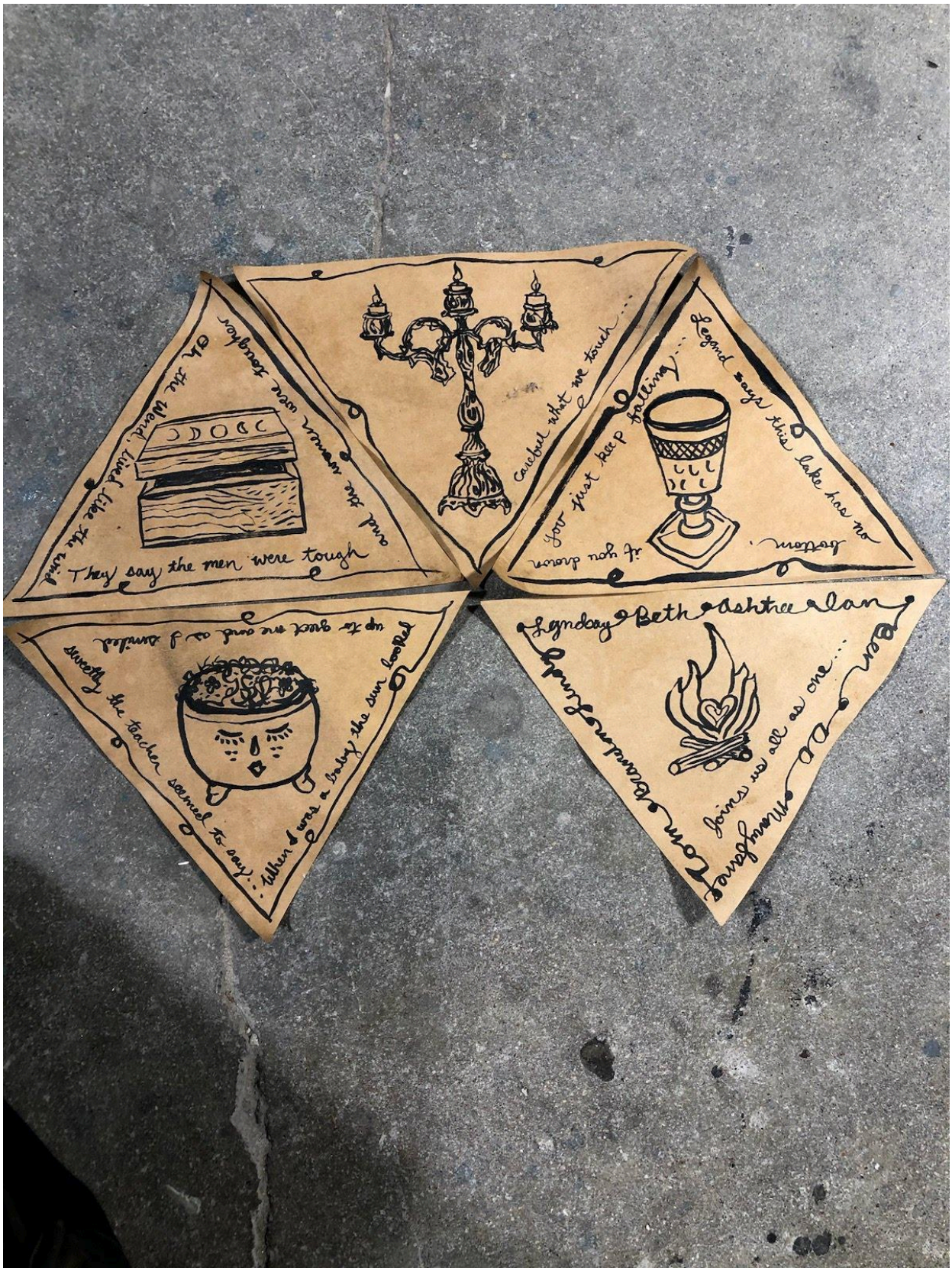
Clues and Artifacts


They say the men were tough
and the women were tougher
Oh the land, like the wind
Careful what we touch...
Legend says this lake has no
bottom...
if you drown
your spirit keep falling...
Legendary Beth Ashtree Clan
Clan Reunion Gathering
Many fans
joins us all as one...
Then I was a baby the sun looked
up to greet me and as I smiled
towards the teacher seemed to say: "Have to pause"

Key knowledge and skills developed by the effigy component of the independent study:

- Build
    - Miter angle cuts to create more fluid shape
    - Pneumatic brad nailer usage and maintenance
    - Ideation with photographs and sketching
    - Pyrotechnics and experimenting with air flow and burn rates
    - Modularity and transport
- Wiring
    - Soldering, circuit creation using copper pennies mated to removable artifacts
    - Circuit programming on Arduino using INPUT_PULLUP
    - Output LED wiring and programming
    - Arduino coding. See Pink Moon Sketch
- Aesthetics
    - Melted Wax
    - Beet Juice and India Ink Dye
    - Dried flowers
    - Artifact design
- Burn
    - Vented design with air flow considered
    - Stage “stuffing” to control burn from base to top
    - Lath for faster burning of moon and heart elements
- Performance
    - Integrated handles and carry points for easy moving
    - Wiring harness for quick removal of the Arduino prior to burning

Venue

For the venue we chose Reliable Street, a defunct feed mill in West Ames that provides resources and space for building community through the arts. The space chosen was in the derelict back part of the abandoned mill that is not normally a public space. I chose it because it was of suitable size, grittiness, and provided the desired mood. It was also very dirty and required about two full days of work to clean up and prepare for the installation and show. There were also some electrical power and safety issues that needed to be addressed prior to staging the show that came out during a dress rehearsal.

Push

Bruh

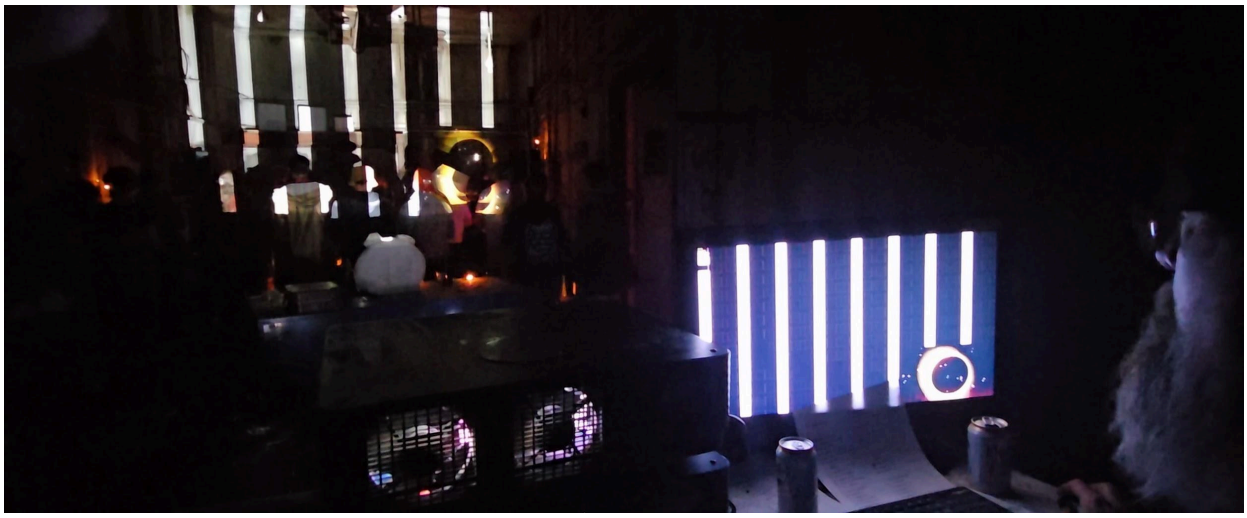
The Show

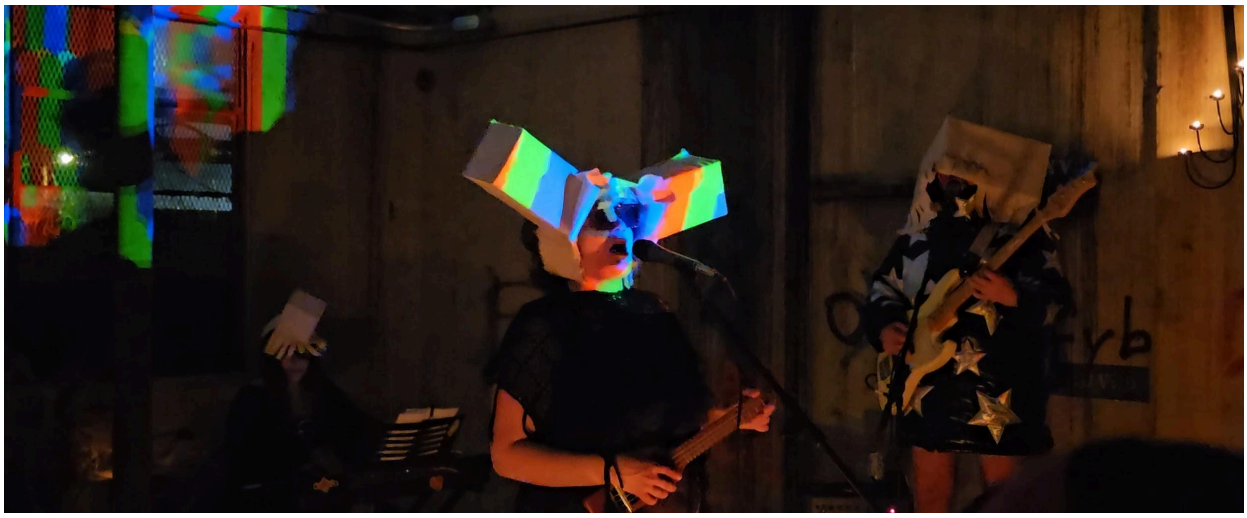
The show took place on the Pink Moon, April 23, 2024 at 7PM. Approximately 100 people attended the show during the three hour duration with about 30 staying all the way through the burning of the effigy in the fire pit at Reliable Street after the live music performance.

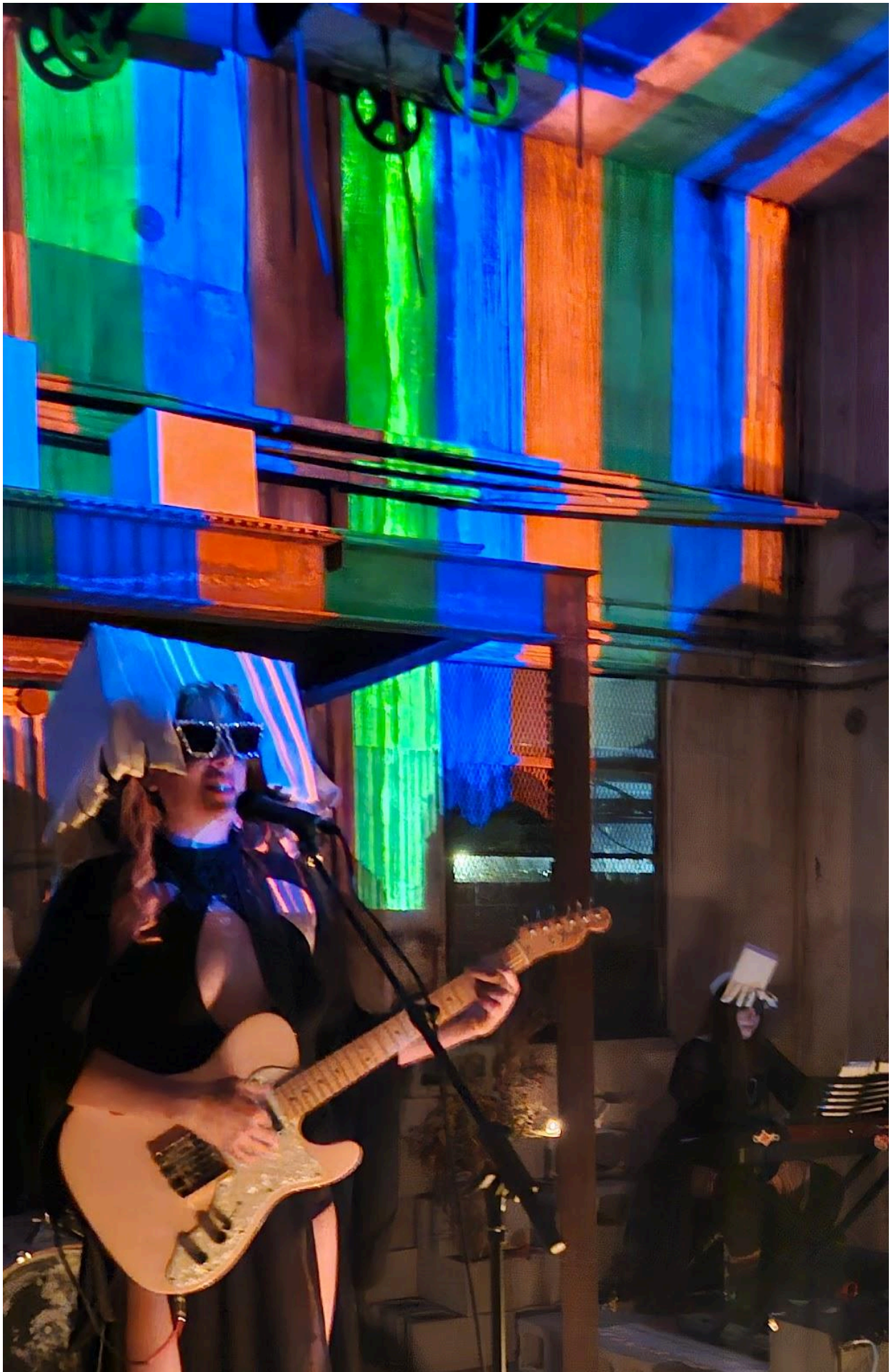
The following poster was created and places around town and on social media to promote the event.

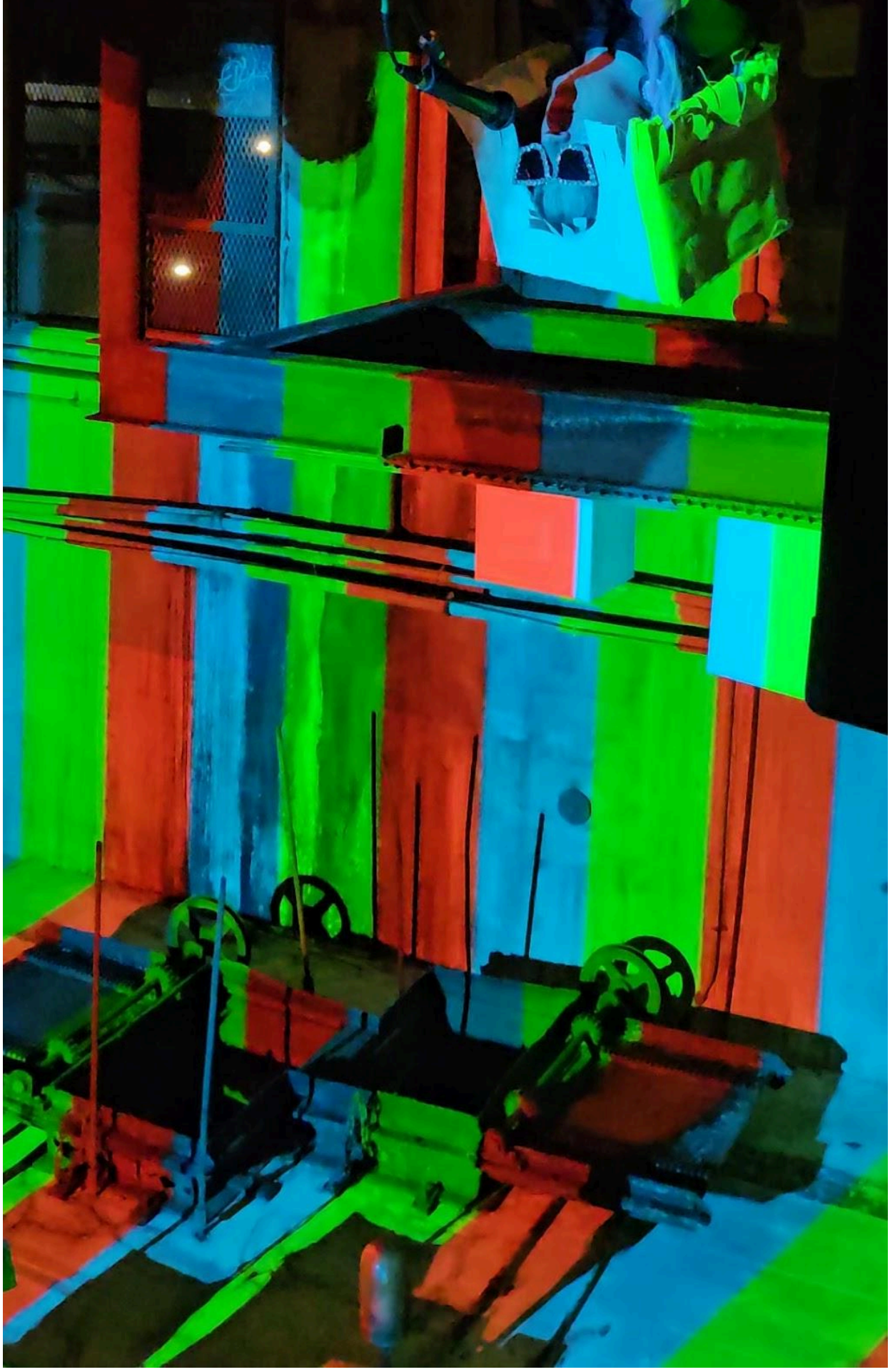
The following images are from the live performance.

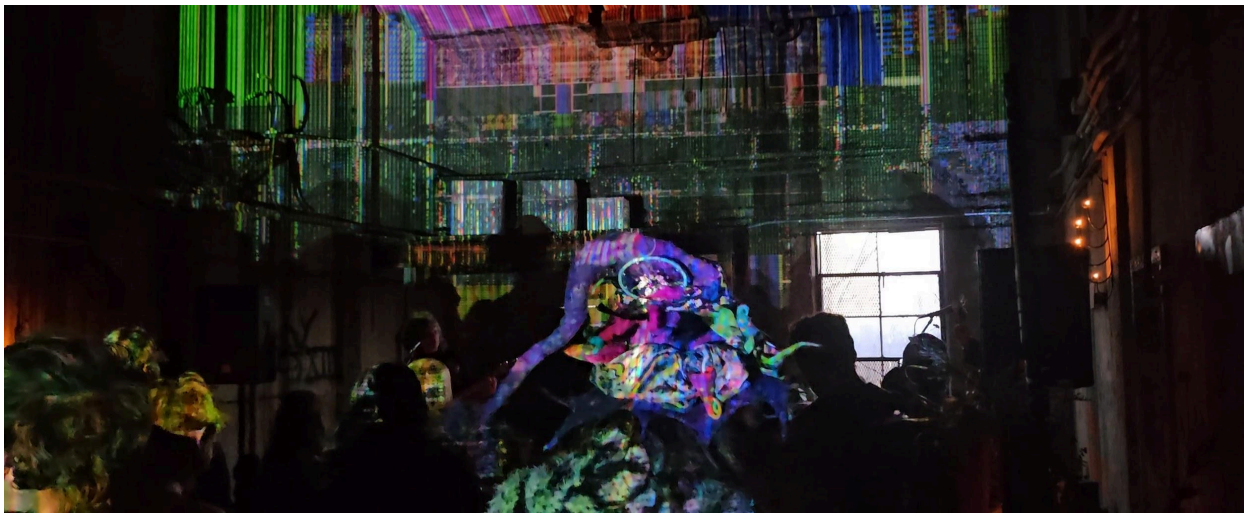
PINK MOON

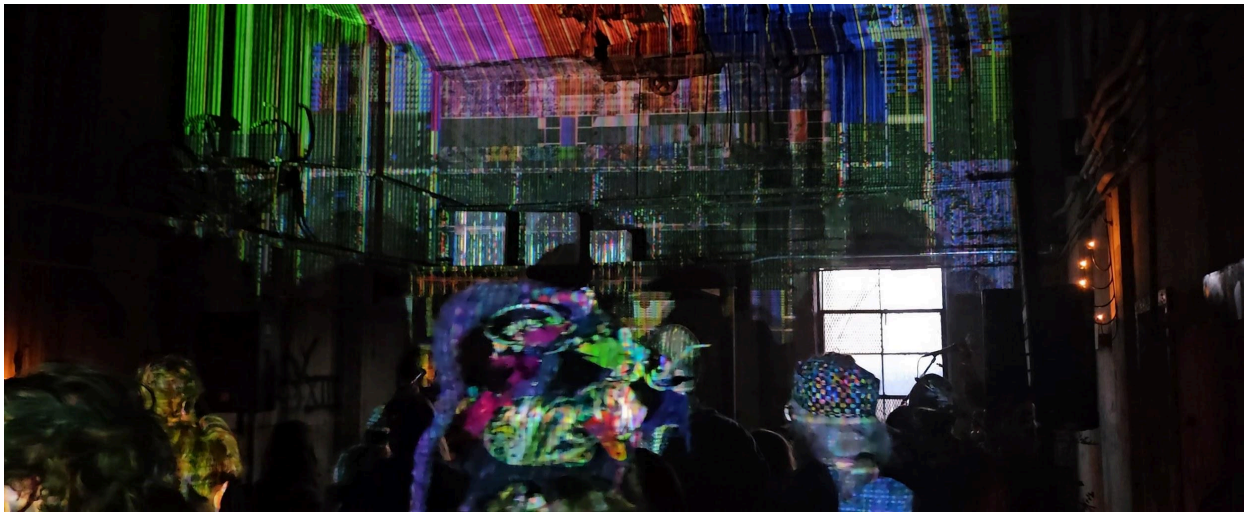












Effigy Burn

Conclusion

This was a very successful project in both the quality of the outcome but also in meeting my learning objectives. All of the parts worked as designed and the show went off without any major complications or unexpected issues. It was very rewarding to burn the effigy at the end and appreciate the hard work as well as the impermanence and one time only nature of the experience. The work was challenging at times and I had beneficial learning in time management, prioritization, scaling, and overall project management in addition to expanding my digital and practical skills.

Most importantly I had a lot of fun and enjoyed each aspect and challenge of the work. I am eager to continue to develop skills in creating interactive experiences and installations that build on and expand this work.

Dan DeGeest, May 4, 2024.