

Project Proposal – “Contactless Control”

OWEN AVON

IMCA 221 – FALL 2023

WWW.OAVONPROJECTS.COM

Contents

PART ONE: PROJECT SYNOPSIS2

PART TWO: DETAILED DESCRIPTION3

Project Background3

Project Setup3

Required Equipment4

PART THREE: OPERATIONAL FLOWCHART5

PART FOUR: SKETCHES6

PART FIVE: BUDGET.....7

PART SIX: PRODUCTION SCHEDULE.....8

PART ONE: PROJECT SYNOPSIS

My proposed project is an interactive installation that uses ultrasonic sensors to control DMX channels of two (2) LED wash lights. A user will vary the distance of their hand from the sensor to trigger various lighting effects. In essence, creating a contactless lighting controller.

The project will incorporate two (2) ultrasonic sensors that are positioned on a tabletop. The sensor on the left will control the chosen colour of the light. The sensor on the right will control the luminous intensity of the light.

PART TWO: DETAILED DESCRIPTION

Project Background

I have been exposed to DMX lighting for years. My older brother was a disk jockey in the early 2000s, and then later studied technical theatre. During the summer I worked at a wedding venue as the audio and lighting technician. I had the opportunity to familiarized myself with DMX lighting, and I learned how to program lights with “Onyx” (formally Martin M-PC), a dedicated lighting software.

I have borrowed two (2) “Big Dipper LP28W” LED wash lights from the wedding venue to use for my project. Each light has 8 predetermined DMX channels that control various capabilities such as the light’s intensity, colour values, strobe effect, colour changing speed, etc. The channel information is found in the LP28W’s [PDF documentation](#).

I was introduced to the ultrasonic sensor in an IMCA 221 class, and I thought it would be interesting to use its capacities to create a contactless lighting controller. The sensor positioned on the left will trigger ranges that will communicate, and modulate channel 5, 6, 7, and 8 of the light (RGBW). The sensor positioned on the right will control and modulate channel 1 of the light (intensity dimmer).

Project Setup

My project will be setup as a physical interaction, and it will allow a participant to control two (2) DMX lights simply through the movement of their hand, hence the name “Contactless Control”. The two-wash lights will sit on the ground of a dark room, and project upwards against the wall. This position will allow the lights to cast against a wide angle for an easy viewing experience.

Two ultrasonic sensors will sit on a table facing upwards. The sensors will be roughly located at waist level of the participant. The participant will stand behind the sensors and move their hand up and down in a vertical fashion to control the lights in a contactless manner. The sensors will read varying distance levels, and thus communicate through the patch to control the different functions of the light. To reiterate, I plan to use two (2) sensors, one to control, and modulate the red, green, blue, and white values, and a second sensor to alter the luminous intensity of the lights. The two lights will be addressed independently so that the participant can control both lights with different results. One light will receive live input from the user, whereas the other light may incorporate a delay or another effect to produce an unexpected result from the light.

The experience is intended to be abstract, explorative, interactive, and playful. Upon starting the experience, the patch will randomly select an audio file from an array to be played back. This will allow the user to attempt to modulate the lights in real-time to the beat of the music. The aim is to create a more engaging audio-lighting experience, and to see if a contactless control system could be a viable option as a lighting controller.

Required Equipment

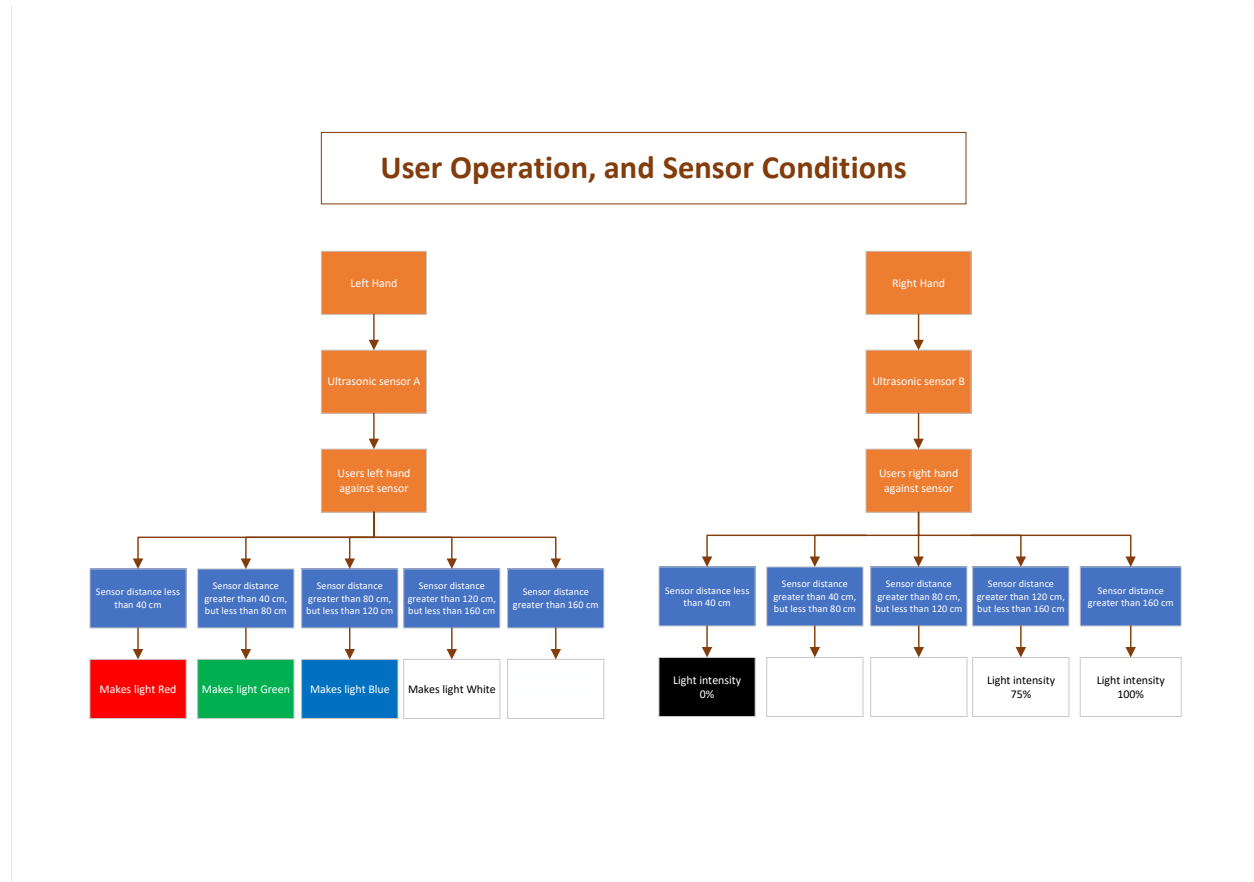
This project will require several physical elements.

- MacBook Pro laptop to host the patch.
- Enttec DMX USB Pro. (Research shows that this interface connects well with serial and MAX. IMCA Depot also has two (2) available for rent)
- 2X DMX cables.
- 2X Big Dipper LP28W LED wash lights.
- 2X Ultrasonic sensors.
- 1X IMCA custom MIDI sensor interface.

At the time of writing this proposal I have acquired the two DMX wash lights. I have also rented an “Enttec DMX USB Pro” interface from the IMCA department for a duration of five days, and I can confirm that I am able to control the lights through an early version patch. I plan to make several reservations in one of the IMCA/EART EVS2 individual studios to work on my project. I intend on renting the “Enttec DMX USB Pro” while I rent the studios. Lastly, I have spoken to James regarding renting two ultrasonic sensors (2) for use inside of the individual studio. See [part six](#) for more information about the rented studio time.

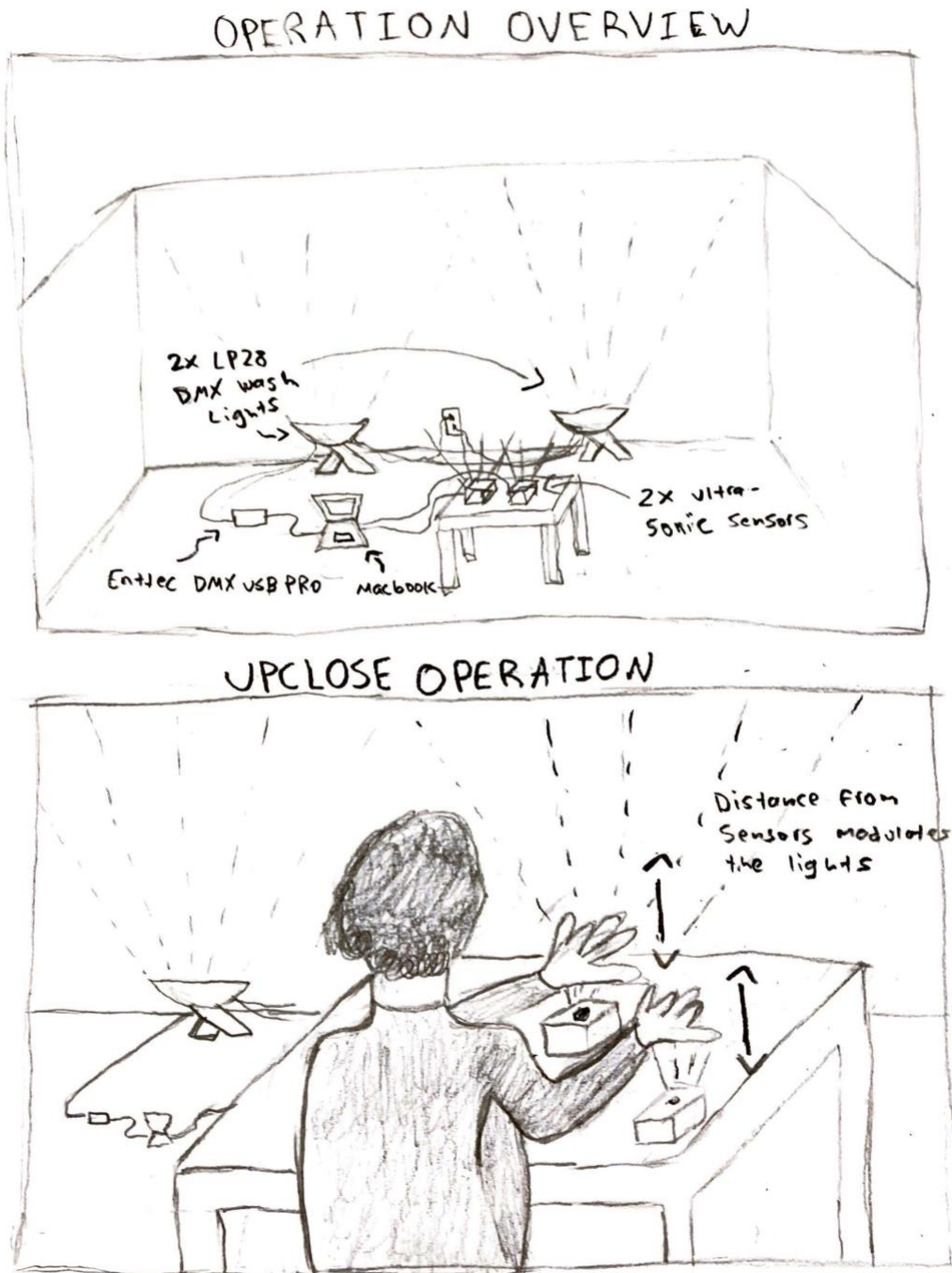
PART THREE: OPERATIONAL FLOWCHART

Procedural flowchart that depicts the two (2) input devices, and how they affect the output devices dependant on operation.



PART FOUR: SKETCHES

Sketch of the overall operation. (Pardon my drawing capabilities...)



Sketch of the user operating the sensors.

PART FIVE: BUDGET

My intention is to produce the project without the requirement of funds. I was able to borrow the two (2) "Big Dipper LP28W" LED wash lights for the length of the school semester. The ultrasonic sensors, "Enttec DMX USB Pro", and custom MIDI sensor interface box can all be rented / accessed from the IMCA department in various ways.

PART SIX: PRODUCTION SCHEDULE

DMX to Computer Test – September 29th to October 4th

- I connected one end of the “Enttec DMX USB Pro” interface to my light, and the other to my laptop running Max. I created a test patch based on the below YouTube tutorial to validate that my project is possible from a technical perspective.
- [Getting Started with DMX - Overview, Touchdesigner & MaxMSP](#)

Proposal – October 24th

- Official submission of this document that outlines my idea, provides further insight regarding how the project will be presented, a breakdown of fundamentals, sketches, flowchart, budget requirements, and the production schedule.

Work on project – On, or around November 7th

- Rent one of the IMCA/EART EVS2 individual studios for several hours.

Work on project – On, or around November 15th

- Rent one of the IMCA/EART EVS2 individual studios for several hours.

Work on project – On, or around November 22nd

- Rent one of the IMCA/EART EVS2 individual studios for several hours.

Final – November 28th

- The project will be presented in EVS.625 SGW for the final critique. The house lights will need to be dimmed, or turned off for the duration of my presentation.