

The Wonder Factory - 2B

Analyses Memo

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Technical Roles and Analyses

1st Technical Role:

1. Student's name and technical role

Fawaz Aladwani & Abdulrahman Almohammad - Microphone input into an arduino board.

2. What question(s) are you trying to answer with this analysis

The questions that we are trying to answer with this analysis are related to how well our model can actually function. Also, how can we store data from the microphone into the arduino. As well as having the ability to know how to use this stored data to fulfil an important functional need to the design. .

3. What model/methodology will you be using

The model/methodology that we will be using is an arduino red board as shown in Figure 1, this could be used to set up a circuit and type up a code enabling the arduino to collect data.



Figure 1- Arduino Red Board [1]

What is required to input data into the arduino is a microphone, as shown in Figure 2, this is an important part of the analysis because of how it manages to serve as a main factor of the final design. It is considered to be one of the first steps towards launching the laser.



Figure 2 - Sound Detection Sensor [2]

4. What assumptions and inputs will go into the model

The assumptions and inputs that will go into the model are the possibility that the arduino might not sync well with the sound detection sensor in terms of the pins being loose and not attached well enough. Also, the coding inserted into the arduino could be reset by accidentally pressing the reset button.

5. What results do you expect from your analysis

The results we expect from our analysis are clear data and innovative design that will function excellently as an addition to The Wonder Factory.

6. How will these results inform your design

These results inform our design through having a well prepared structure that allows sound to be stored and analyzed to be used as an output, thus, shaping the laser on the surface.

2nd Technical Role:

1. Student's name and technical role

Faisal Alfares - Research about the laser the team will be using

2. What questions are you trying to answer with this analysis

We are trying to find the suitable ways for transforming the waves into shapes. The method of transferring the waves into shapes shall be explored. We need to find the suitable battery size and ratings of the laser.

3. What model/methodology will you be using

There will be a piano and arduino set. It will receive the sound waves and store the sound coming out of piano. The laser will produce shapes based on audio

4. What assumptions and inputs will go into model

This type of laser provides a continuous output, which is pumped at constant rate. The laser rod is heated due to the light source and thermal expansion results. The rod serves as a lens and the beam is expanded.

5. What results do you expect from your analysis

- No chance of material wastage
- Availability of continuous operation
- Simple construction
- Economical operation
- Small beam diameter

6. How will these results inform your design

The results will be helpful in developing the feasibility analysis of the design. The laser is fed by the microcontroller. There is a sensor attached with microcontroller. The sensor works for transforming the sound waves into image waves fed into the laser. In this way the sound waves will be transformed into image waves.

3rd Technical role

1. Student's name and technical role

Abdullah Bouhamad and Abdullah Aljafaar- Arduino FFT

2. What question(s) are you trying to answer with this analysis

The questions that we are trying to answer are about the functional usage of the arduino and it's resulted graphs. Also, we are aiming to introduce the implementation of an arduino FFT (Fast Fourier Transform).

3. What model/methodology will you be using

The model/methodology that we will be using is as discussed and shown in Figure 1. We will be able to apply the FFT coding into the arduino. It will result in different shapes based on chosen preference.

4. What assumptions and inputs will go into the model

The assumptions and inputs that will go into the model are the potential error that might occur once applying the Fast Fourier Transform into the arduino. For example, applying the wrong coding into the arduino as well as not finding the correct frequency for the different x-axis and y-axis that we might find.

5. What results do you expect from your analysis

The results that we expect from our analysis are to initially be able to function different shapes through using the arduino and finally being able to be professional with using the arduino.

6. How will these results inform your design

The results will inform our design by creating an excellent and perfect structural analysis in terms of working with the arduino and its graphs. Thus, helping us to have a clear idea on what will the inputs form as an output. We will be able to learn how to code, function, and prepare different stuff through the arduino.

References

- [1] <https://www.sparkfun.com/search/results?term=microphone>
- [2] https://www.amazon.com/Detection-Intelligent-Compatible-Atomic-Market/dp/B00TM7R21W/ref=sr_1_14?ie=UTF8&qid=1521082787&sr=8-14&keywords=microphone+arduino