IKEA PENDANT LAMP
PROJECT DOCUMENTATION

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For my first physical interaction design (PiXD) project I chose to take a mechanical celing lamp from Ikea and hack it to be a desk lamp and additionally to rig up the pulley system to a servo so it can open and close using a sensor programmed using Ardiuno. This project had a duration of 4 weeks and roughly took me 20+ hours and $250 for all necessary parts.

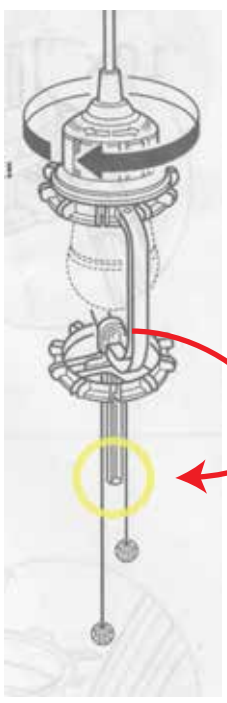


Figure 1

1. *Changing Lamp Construction*

Becuase the lamp was designed to be hung from the celing (figure 1), I either needed to build the lamp with a frame to hold it steadily in it's place **OR** build out the lamp ***upside down*** so I can use the top for structural integrity. I ended up choosing the second (figure 2).

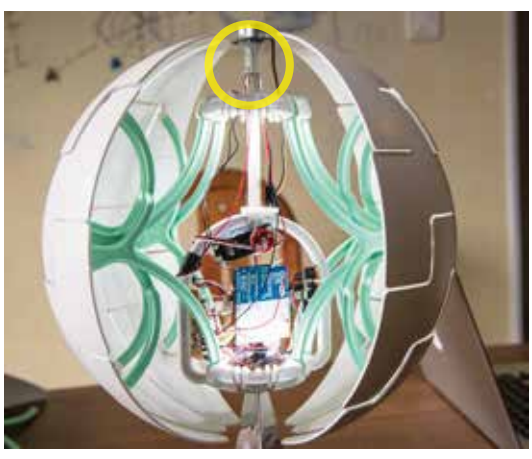
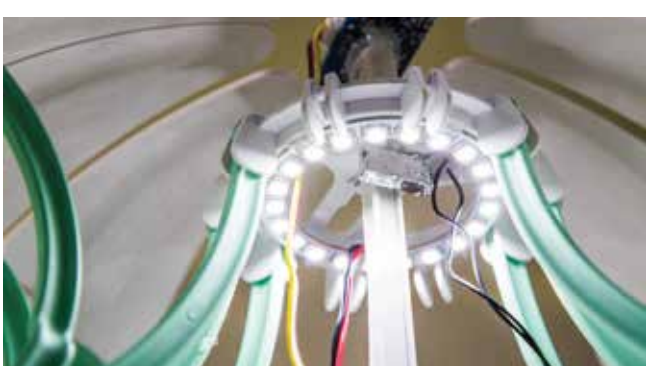


Figure 2

2. *New 12v LED Lighting*

The original light supply ran from 220v and was just a standard bulb. So that I could save on space inside, I chose a 7cm circular ring LED strip powered by 12v.

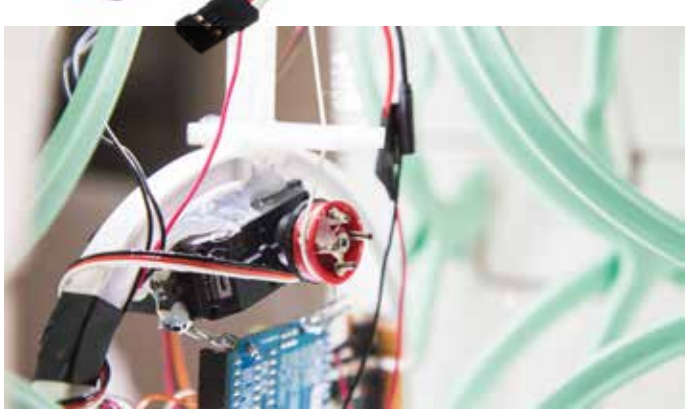


3. *Sonar Sensor to Trigger Lamp*

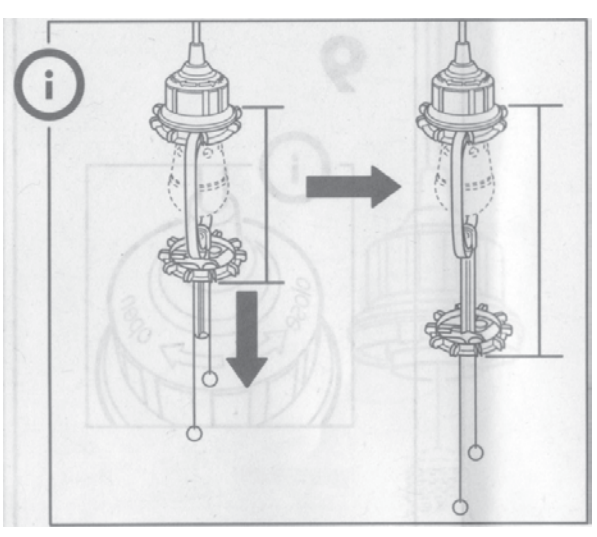
I purchased a 5v sonar sensor to act as the switch forthe servo in the lamp. When the waves within the specified distance (12 inches), then the lamp will either open or close. This sensor was more fitting for my application because in future versions, I can include different ranges to have different functions.

4. *Continuous Rotation Servo*

The key component to the lamp actually functioning properly was the servo. I did a lot of testing to decide how to mount the servo, how to control the reel, and how it would lift the light assembly.



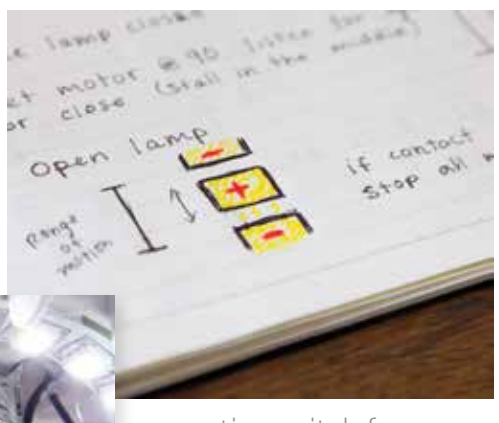
Servo mounted inside lamp, string pulley now running in the opposite direction.



Model showing the distances between open and closed positions.

FINAL CHALLENGES

When testing my servo, I realized I had no way to stop it from spinning into oblivion and ripping my lamp apart. So I created two switches at the minimum and max points on the track. As the top part of the lamp hits the top, the trigger is switched and the if statement is set to stop the servo.



negative switch for
bottom (min) switch

In the end the prototype is works great and everything is (surprisingly) holding together nicely. Now I will take what I've learned in this verson and apply it to a much more refined prototype that will have all the great features I'm looking for! See you next time.

want to see it in action?

http://youtu.be/12b3b5