Light System

EK 210 A8 group 2B:
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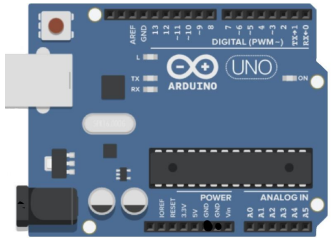
Problem Statement

The goal is to design and implement a directable, touchless, overhead light system that the elderly and those with limited mobility can easily utilize to assist them with their daily tasks.

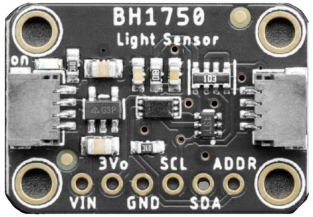
Our Design and the key components

Arduino Uno



Processes signals, controls LED screen and motors

Ambient Light Sensor



Detects brightness of environment, signals to arduino

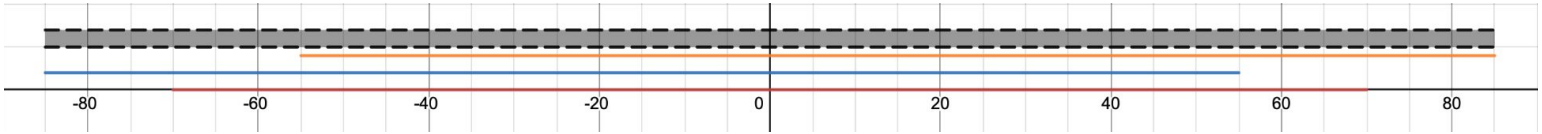
Faced 270° away from LED panel

Speech Recognition Module

Programmed with 6 commands

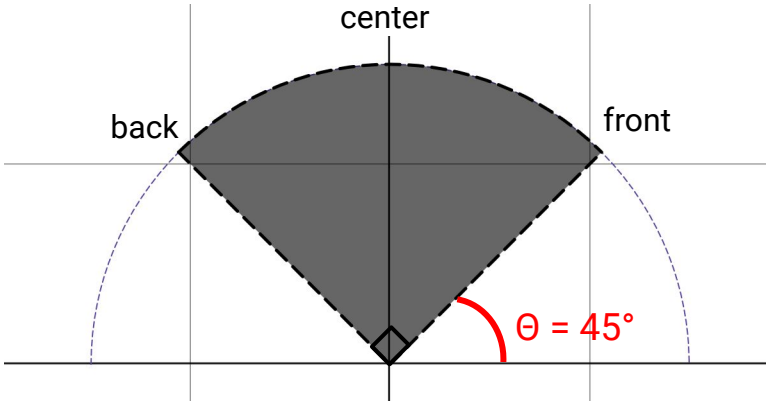
Testing

Lighting



Commands	Back	Center	Front
Range (in)	{-85, 55}	{-70, 70}	{-55, 85}

Directible



Specifications/Metrics

OBJECTIVES	METRICS
Safe	
	☑ LEDs will not become blinding when looked at directly
	☑ Wires are not exposed
Reliable	
	☑ Does not require power source replacement
	☑ Durable Housing
Touchless	
	☑ Voice controlled
Lighting	
	☑ 4 brightness settings
	☑ Yellow hue setting
	☑ Spotlight capabilities
Directible	
	☑ Forwards, backwards, and center tilts for the LED panel
Installation	☑ Set up once
	☑ Overhead

Operation

To use the device, the user speaks to the voice module beside them. There are 6 commands:

Power → Lights up the LED sheet

Yellow → Changes the LED's hue to yellow

Spotlight → Reduces light to one area, creating a spotlight

Front/Back → Tilts the LED sheet forwards/backwards

Center → Centers the LED sheet along motor's rotational axis

Repeating a command has an "undo" effect.

Additional features of this light system include four brightness settings dependent on the brightness in the room.

Operation Video