

Wearable Light Logger to Facilitate Full Spectrum Light Dosing for Mood Disorders

Date: October 18th to October 24th, 2024

Client: Dr. Jean Riquelme

Advisor: Dr. Brandon Coventry

Team:

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Problem Statement

Currently, there are no affordable wearable light-logging devices on the market. Full-spectrum light therapy has been proven to be successful in treating mood disorders, especially seasonal affective disorder, but patient response studies are lacking. A wearable allows for accurate representation of light intensities that reach the retina, the presumed site of action. A wearable light logger would provide convenient research into what correct dosages for optimal patient response look like for patients suffering from mood disorders.

Brief Status Update

This week, we began ordering the final components needed for our project. We also met with our advisor to get help soldering small pins to our breadboard. We are continuing with initial prototyping and beginning to prepare for the Show and Tell.

Summary of Weekly Team Member Design Accomplishments

- Team:
 - Soldered components at WIMR
 - Continued initial fabrication

- Molly Wilhelmson:
 - Continued working on finding resistor values to fabricate the circuit

- Ella Eklund:

- Soldered components at WIMR
- Continued initial fabrication

- Neel Srinivasan:
 - Met with Dr. Coventry to learn how to solder our opamps and circuitry.
 - Continued to develop code

- Kate Briesemeister:
 - Continued trying to find a light sensor that senses the wavelength and intensity necessary for our product

Weekly/Ongoing Difficulties

Finding converters for small op-amp and analog to digital converters.

Upcoming Team and Individual Goals

- Team:
 - Continue designing circuitry and code
 - Begin drafting a solidworks file for the circuit boxes
- Molly Wilhelmson:
 - Fabricate a circuit and test the code
- Ella Eklund:
 - Fabricate a circuit and test the code
- Neel Srinivasan:
 - Continue coding
 - Prepare for show and tell
- Kate Briesemeister:
 - Decide on a light sensor and order it
 - Finish an initial CAD file for the 3D printed box

Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Meet with client	09/13	All	100%	Yes
→ Product Design Specification	09/20	All	100%	Yes
Preliminary Presentations	10/4	All	100%	Yes
Preliminary Deliverables	10/9	All	100%	Yes
Show and Tell	11/01	All		
Poster Presentations	12/06	All		
Final Deliverables	12/11	All		

Expenses

Item	Description	Manufacturer	Part Number	Date	QTY	Cost Each	Total	Link
Component 1								
Happy Light	Light for testing sensor	Verilux	N/A	9/13/24	2	\$49.99	\$99.98	Link
Component 2								
Battery	Battery for chip	PGSONIC	CR2045	9/19/24	1	\$1.15	\$1.15	Link

Component 3								
Head Lamp	Light that attaches to head	Fire Supply Depot	FL8210-6SM D	9/26/24	1	\$11.92	\$11.92	Link
Component 4								
Raspberry Pi	Chip for coding	Raspberry Pi	Raspberry Pi Pico W	10/4/24	1	\$7.20	\$7.20	Link
Component 5								
Comparator	Building circuit	Texas Instruments	LM393PE4	10/4/24	2	\$0.25	\$0.50	Link
Component 6								
Battery Holder	Holder for coin battery	Digikey	BS-2450	10/4/24	1	\$3.84	\$3.84	Link
Component 7								
OPAMP	Building circuit	Digikey	AD8276ARZ	10/4/24	1	\$7.37	\$7.37	Link
Component 8								
IC DAC 12BIT V-Out	Building circuit	Digikey	MCP4726A0T -E/CH	10/4/24	3	\$6.48	\$6.48	Link
TOTAL:								\$138.44