

# Online Procedures for Photophobic Testing

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The background features a large, abstract graphic composed of several concentric, overlapping rings. The rings are primarily light blue and light green, with some darker shades of blue and green interspersed, creating a layered, tunnel-like effect. The rings are not perfectly circular, with some segments missing or offset, giving it a dynamic, organic feel.

# Photophobia and Traumatic Brain Injury



# Photophobia and Traumatic Brain Injury

- **TBI:** Brain dysfunction caused by an outside force, usually a violent blow to the head
- **Photophobia** is a *symptom* of Traumatic Brain Injury
  - Sensitivity to light
  - Migraines

A decorative circular graphic composed of several concentric, wavy bands in shades of blue and green, framing the central text.

# Our Clients

The background features three overlapping circles in two shades of blue (a darker outer ring and a lighter inner ring) on a dark gray background. A solid white horizontal band cuts across the middle of the circles.

## Our Role

# The Problem

“Ophthalmologists hate people when people come in with non-descriptive cases of visual problems”

“There is no tool that diagnoses these problems.”

- Dr. Amanda Harrison

# Our Solution



## Create

Create a program to  
diagnose photophobia in  
patients with TBI



## Give

Give ophthalmologists a  
standardized product to  
diagnose patients with  
photophobia



## Help

Help TBI patients get the  
proper treatment they  
need



# User Stories



## Dr. Mary Johnson

Dr. Mary Johnson is an ophthalmologist at Johns Hopkins University. She works with patients with traumatic brain injury and frequently diagnoses patients with consequential photophobia. She complains that current methods of diagnosis are anecdotal and time consuming. She wishes there was a tool that could quantifiably and consistently diagnose photophobia in her patients.

# Cindy Smith and Dr. Amanda Henderson

Cindy Smith is a patient of Dr. Amanda Henderson at Johns Hopkins University. After a serious car accident, she was diagnosed with traumatic brain injury. Recently, she has been experiencing significant discomfort when exposed to light conditions she used to find tolerable. Cindy wants to visit the doctor for a diagnosis because believes she may have developed photophobia as a result of her car accident. Unfortunately, Cindy is immunocompromised and has been instructed to avoid medical facilities unless she is experiencing an emergency by her general practitioner as to not risk contracting COVID-19. Dr. Henderson wishes there was a way she could help Cindy without an in-person visit.

An abstract graphic featuring a large circle with a white center. The circle is framed by several concentric, wavy bands of color. The left side of the circle is bordered by blue bands, while the right side is bordered by green bands. The bands have a soft, blurred appearance, creating a sense of depth and movement.

# The Product

# Scope and Requirements

Develop

Develop a series of tests using the scientific instructions provided to us by our clients at Johns Hopkins University



Distribute

Distribute these tests to patients using **Qualtrics**



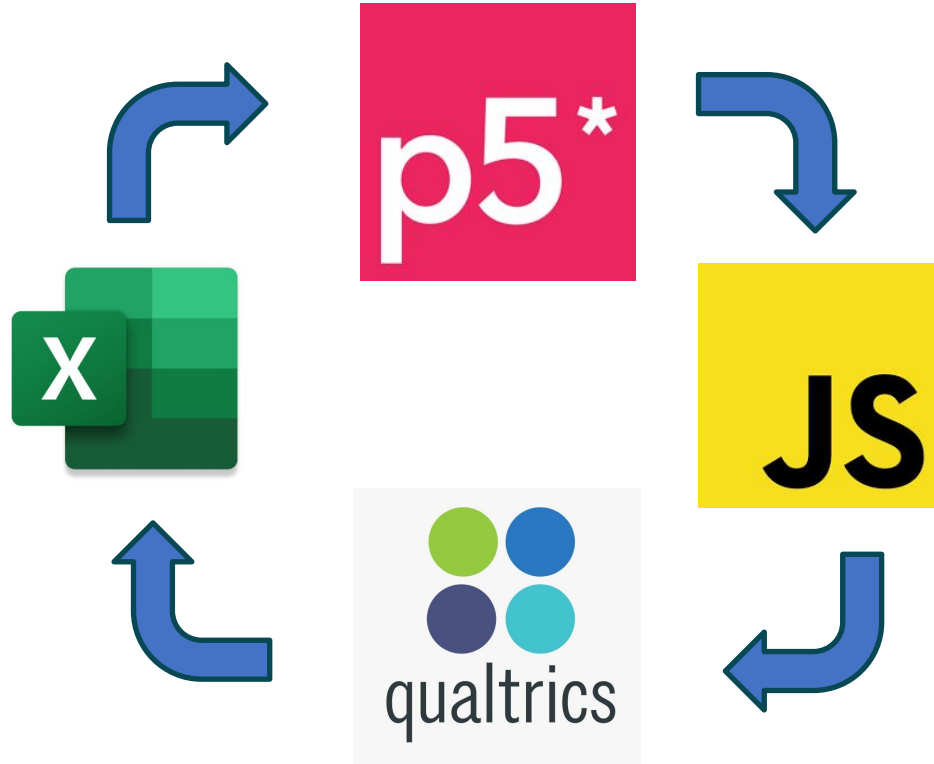
Analyze

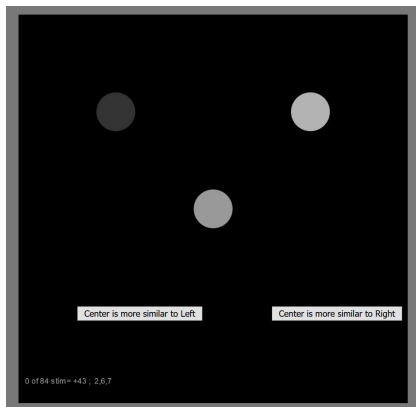
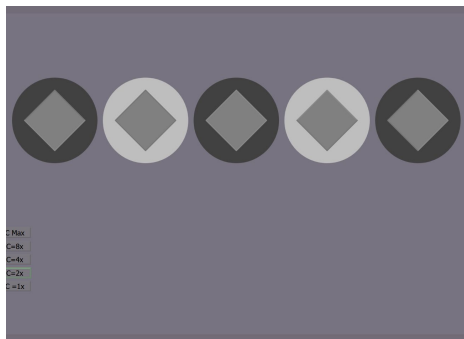
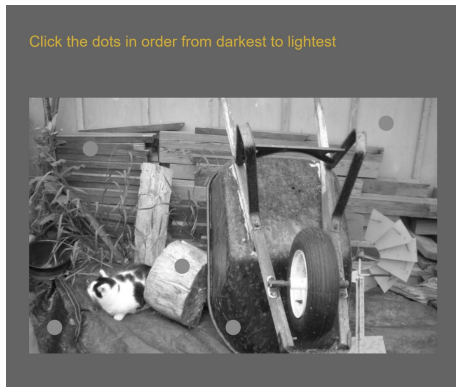
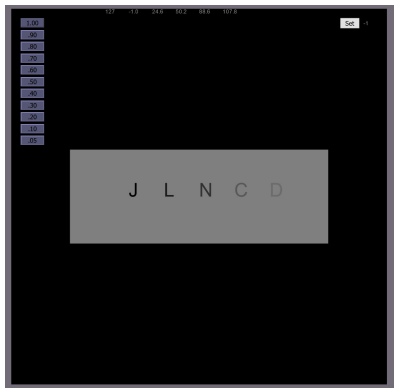
Analyze and provide our clients with the data collected in order facilitate diagnosis

# Functionality and Capabilities

- Demo vid here

# Implementation





# Progress

# Progress and Issues

- Calculated R squared value with observer answers vs the filter and dot number
- Aiming for R squared of .9 or higher across the board

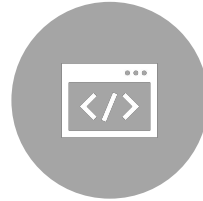
Filter	r2 Observer A	r2 Observer B
Wheel 1	0.740	0.955
Wheel 2	0.810	1.000
Kings 1	0.936	0.817
Kings 2	1.000	0.810
Checkers 1	0.881	0.844
Checkers 2	0.810	0.810
Park 1	0.813	0.672
Park 2	0.810	0.810



# To Do



Data analysis  
using Excel



UI / UX cleanup

# Analysis

- Efficiency, scalability, expandability, usability.....

- Explain how much more time efficient it is to do our test instead of going through an arbitrary check list list of symptoms for diagnosing

- Usability – talk about how it will be useful for covid times and how it is easy for Doctors

- Scalability/ expandability: Talk about how this could be used by any doctor. If Johns Hopkins aka the gold standard of med science would use this product so would pretty much any medical facility

# Questions

