

# **Dynamically Polarizing Glasses**

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## **Group 2.4**

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# What's the Problem?

What's the Problem?

- For people with extreme light sensitivity
- Reduce the number of tinted glasses
- Need only one wearable device
- Lightweight
- Automatically adjust





## Customer Needs

- Can automatically adjust brightness using electronics
- Concerned with the durability / robustness of the electronics
- Water resistant
- Can handle winter temperatures ( $\leq 10^{\circ}\text{C}$ ) as well.

# Benchmarking

<b>Specification</b>	Cocoons 	SUGLSS 	AIDEN 	App-enabled electrochromic 
<b>Description</b>	peripheral vision polarized to eliminate blinding glare sports frame	photochromic lenses plastic frames 1 minute.	solar battery internal holder 1 second	app to change the tint level of lenses, a built-in location finder
<b>Material (Frame/lenses)</b>	Neoprene optical-grade lens material	plastic/TAC	TR90/liquid crystal	TR90/TAC
<b>Weight</b>	25-28g	21g	41g	26 g
<b>Peripheral Vision</b>	yes	no	no	yes
<b>Visible light transmission</b>	13%	15%.	10%	4% - 38%
<b>Photochromic lenses</b>	no	yes	yes	yes

# Target Specifications

Metrics ID Number	Metrics Descriptor	Units	Target Values
1	Cost	CAD	\$ 78.50
2	Weight of the glasses	g	< 26 g
3	System response time	s	< 0.1 s
4	Visible Light Transmission (%)	<i>Unitless</i>	4% - 38%
5	Battery Life	days	~ 7 days
6	Cold Weather Durability	°C	>-20°C

**Assumption:**  
An electrochromic display (Liquid crystal light valve) can be utilized to vary the amount of light being transmitted through the glasses

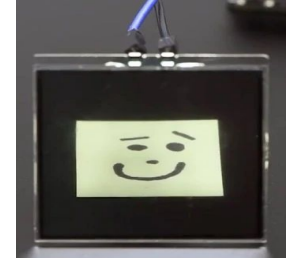
# Decision Matrix

Criteria	Importance	Design A	Design B
Cost	3	2	4
User Friendly	5	4	3
Weight of the Glasses	4	3	4
System Response Time	4	5	1
Visible Light Transparency (%)	5	5	5
Battery Life	3	3	5
Total	N/A	92	88

## Design A

### Lens

- Liquid Crystal Light Valve



## Design B

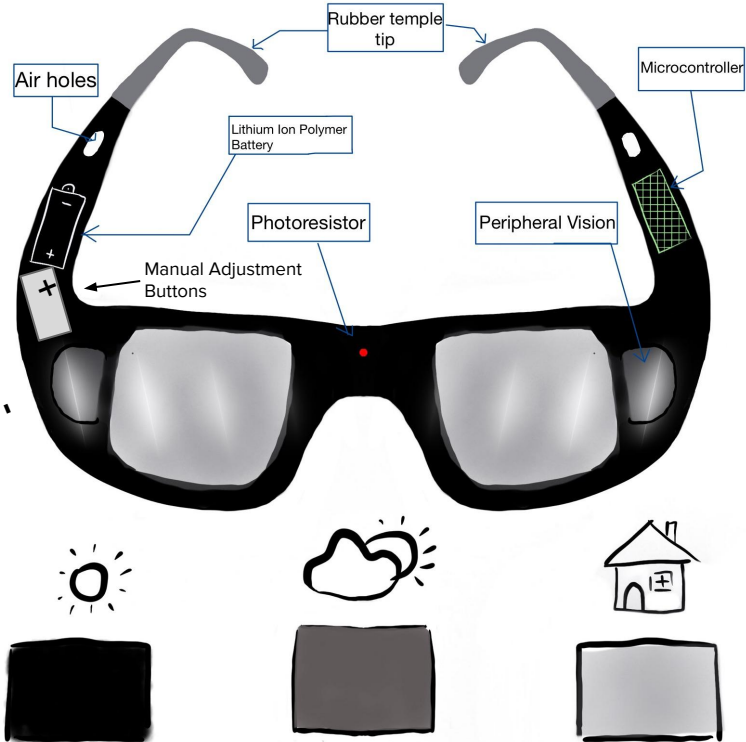
### Lens

- Polarizing Filters

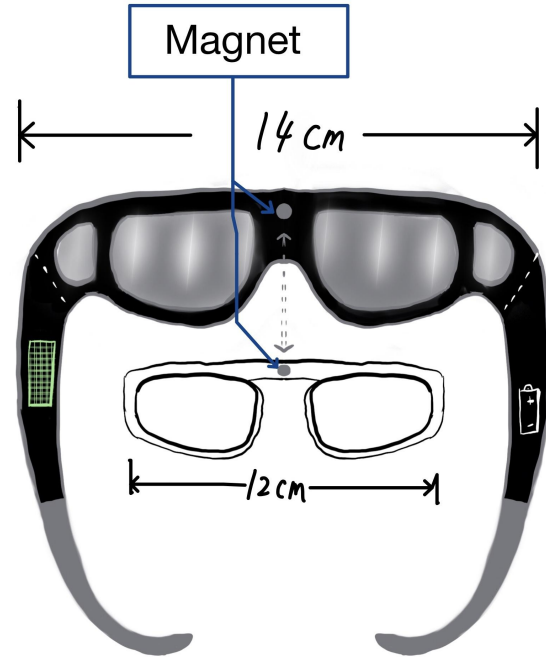


# The Most Favourable Design (Cont'd)

## Outside View



## Inside View

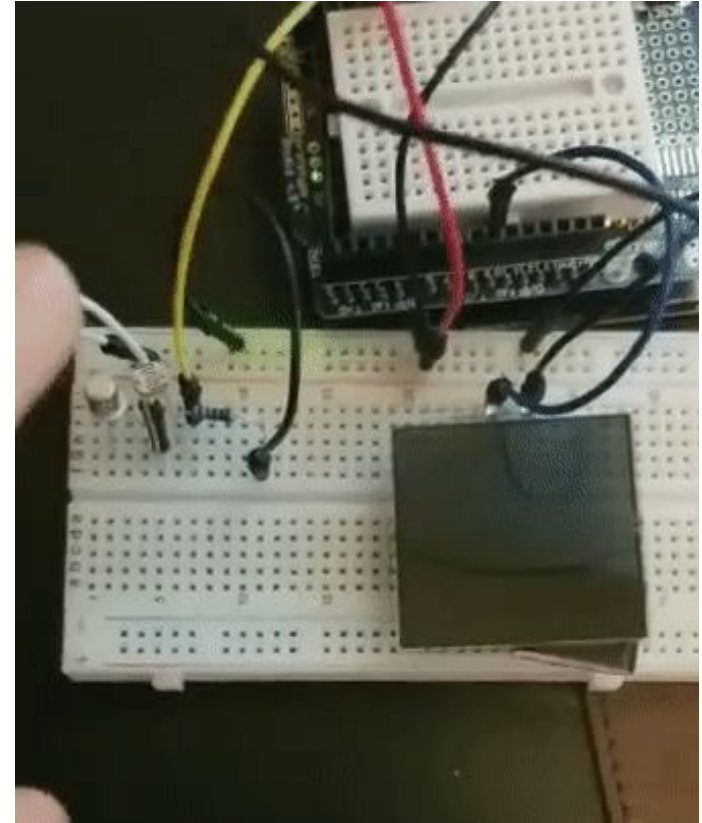
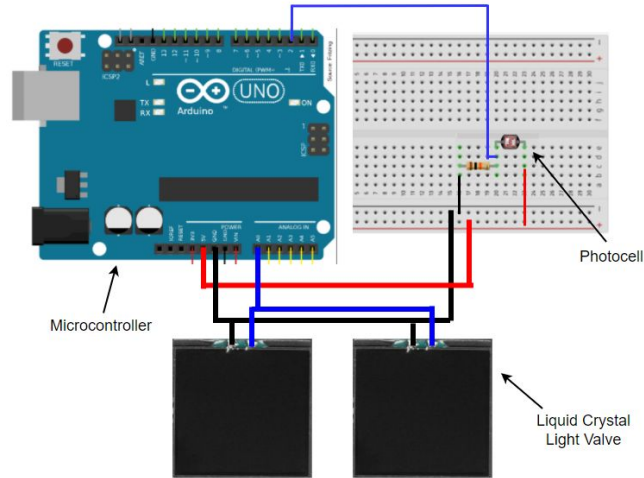




# Prototype I

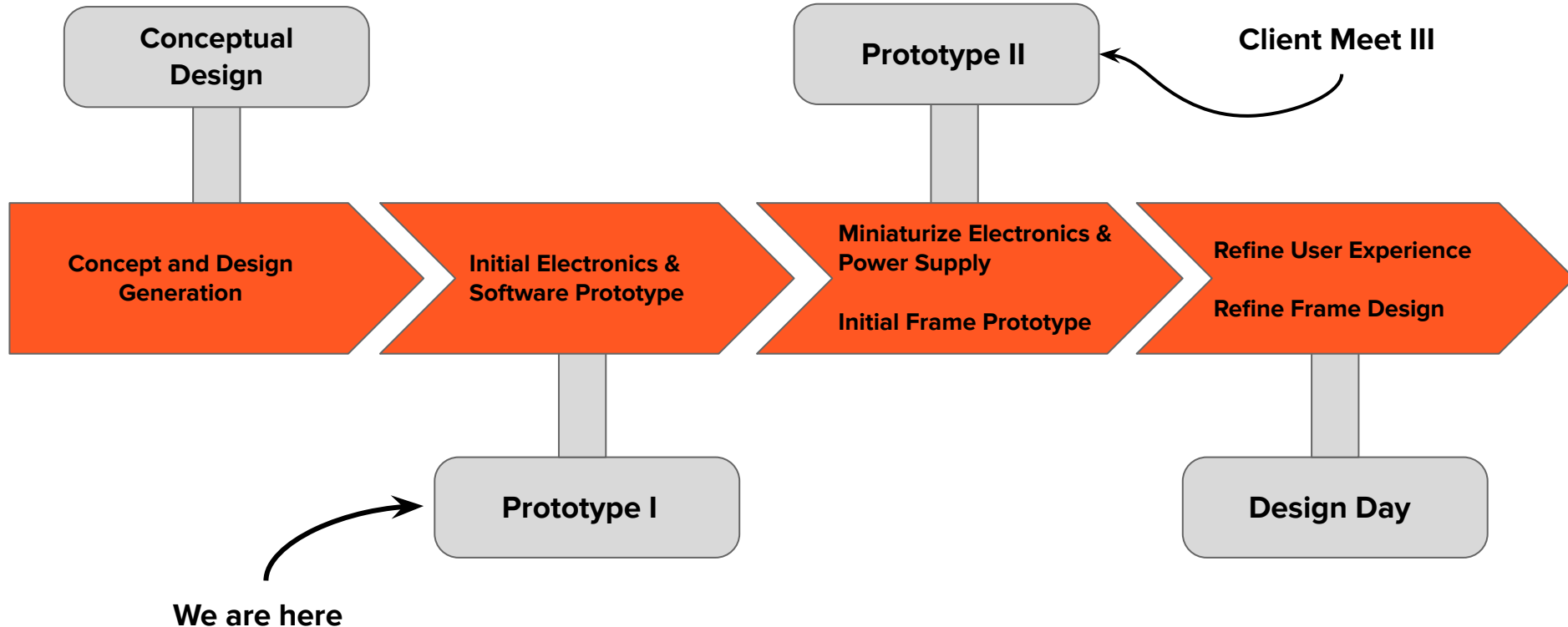
Objectives:

- Assess the electrochromic displays
- Assess photocell feedback mechanism





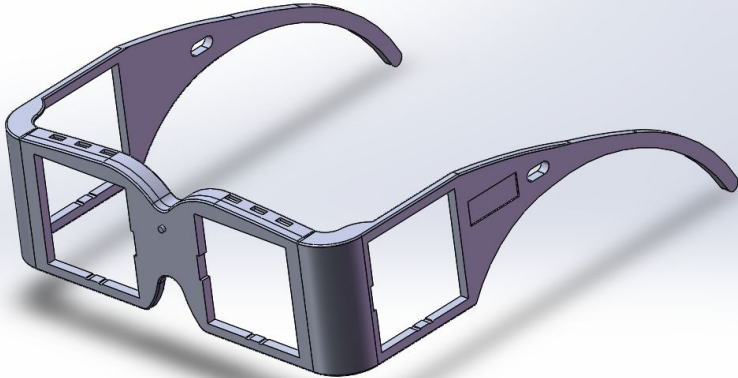
# Prototype Road Map



**Thanks!**  
**Questions?**

# Sneak Preview

Initial Frame Design



Miniaturized electronics with power supply

