**Window Blind Tilt System**

**Objective**

- Homeowners need an add-on device that automatically controls tilt adjustment of horizontal window blind slats based on sunlight intensity.
- For busy individuals and homes with sunrooms and window gardens
- Market Size: 860,000 customers in the DC Metro Area

**Concept Generation**

- Competitors:
  - Integrated into head rail
  - Remote controlled
  - Cost $>100

- Decision characteristics:
  - Location (0.52 wt),
  - Dimension (0.03),
  - Cost (0.13),
  - Weight (0.07),
  - # of Preset Tilts (0.24)

- Through the Pugh and AHP selection process, of the 5 designs created (3 shown here), Design 3 was chosen

**Customer Requirements**

- Simple Operation
- Add-On Feature
- Controllable Tilt Angle

**Engineering Characteristics**

- Number of Tilt Presets
- Location, Dimension, Weight
- Light Threshold

**Constraints**

- Noise Level
- Weight
- Attachment and Frame clearances

**Physics of the System**

- Torque required to turn slats: 0.086Nm

**Design**

- Add-on device which attaches to a blind’s head rail
- Presets located on the wand allow for user defined angles
- Light sensor for hands free operation
- Maintains the use for the manual wand

**Special Design Features**

- Simple to operate
- Easy to install
- Tradeoffs: Servo motor instead of DC motor for better position control

**Prototype and Testing**

**Effectiveness of System at Different Angles**

<table>
<thead>
<tr>
<th>Angle (θ)</th>
<th>Mean (s)</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
<td>± 1.0</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>± 4.2</td>
</tr>
<tr>
<td>3</td>
<td>90</td>
<td>± 2.9</td>
</tr>
</tbody>
</table>

**Results and Future Work**

**Recommendations**

- Further miniaturize the components for a smaller add-on device
- Improve aesthetic appeal
- Identify low cost suppliers for components

**Reflection**

- Important steps for the development of the design were concept generation and prototyping
- This process determined flaws and points for improvement
- Logic Technologies identified an unmet need and through the development process was able to provide a product that would meet the needs of the customer