Bike Wheel Display

Sketch Model Review

10/6/11
Problem

- In 2009, there were **630** pedalcyclist traffic-related fatalities.

**Accident Statistics**

- Intersection Hit: 72%
- Front Collision: 70%
- After 4PM: 62%
- From Behind: 30%

Source: Light & Motion Market Data
Proposed Solution

Bike Wheel Display

- A union of safety and personalization
- Self-generating power
Sketch Model

→ Is regenerative power sufficient for high visibility at a sustainable cyclist output?

→ How can we guarantee a consistent image on the wheel?
Proposed Solution - Power
Proposed Solution – Positioning

- Encoder provides exact angular position
- Microcontroller determines appropriate LED output
# Current Market - Benchmarking

<table>
<thead>
<tr>
<th></th>
<th>Conventional LED Bike Lights</th>
<th>Monkeylectric</th>
<th>Project Aura</th>
<th>Us</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost</strong></td>
<td>$20-$700</td>
<td>$65 - $2000</td>
<td>N/A</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Market</strong></td>
<td></td>
<td>20 million bikes sold in US in 2010</td>
<td></td>
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<tr>
<td><strong>Power</strong></td>
<td>Battery-Powered</td>
<td>Battery-Powered 3 AA Batteries – 48 hours on low power</td>
<td>Self-generating Hub Dynamo + Slip Ring</td>
<td>Self-generating Bottle Dynamo ~6W</td>
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<tr>
<td><strong>Image</strong></td>
<td>N/A</td>
<td>Patterns &amp; Images, Function of speed</td>
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</tbody>
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Conclusion

• (0.5 Amps)(12 Volts) = 6W Power requirement
• Microcontroller and hall effect sensor encoder is sufficient to generate POV display
• **What’s Next:** Lower RPM, Optimize Light Intensity, Scale up POV capability